BABOK®

v3

A GUIDE TO THE BUSINESS ANALYSIS BODY OF KNOWLEDGE®

IIBA® International Institute of Business Analysis™

BABOK®

v3

A GUIDE TO THE BUSINESS ANALYSIS
BODY OF KNOWLEDGE®

International Institute
of Business Analysis™

International Institute of Business Analysis, Toronto, Ontario, Canada.

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Preface

IIBA® was founded in Toronto, Canada in October of 2003 to support the business analysis community by:

- creating and developing awareness and recognition of the value and contribution of the business analyst,
- defining the *Business Analysis Body of Knowledge®* (*BABOK®*),
- providing a forum for knowledge sharing and contribution to the business analysis profession, and
- publicly recognizing and certifying qualified practitioners through an internationally acknowledged certification program.

The Body of Knowledge Committee was formed in October of 2004 to define and draft a global standard for the practice of business analysis. In January of 2005, IIBA released version 1.0 of *A Guide to the Business Analysis Body of Knowledge®* (*BABOK® Guide*) for feedback and comment. That version included an outline of the proposed content and some key definitions. Version 1.4 was released in October of 2005, with draft content in some knowledge areas. Version 1.6, which included detailed information regarding most of the knowledge areas, was published in draft form in June of 2006 and updated to incorporate errata in October of 2008.

The Body of Knowledge Committee developed version 2.0 of *A Guide to the Business Analysis Body of Knowledge®* (*BABOK® Guide*) with the guidance of expert writing teams, and feedback garnered from expert, practitioner, and public reviews. Version 2.0 introduced such concepts as the Requirements Classification Schema and the Input/Output models. Version 2.0 was published in 2009 and became the globally recognized standard for the practice of business analysis.

Following the publication of version 2.0, IIBA sought out a number of recognized experts in business analysis and related fields and solicited their feedback on the content of that edition. The Body of Knowledge Committee used these comments to plan the vision and scope of this revision. The Body of Knowledge Committee worked with teams of expert writers to revise and update the content. The revised draft of *A Guide to the Business Analysis Body of Knowledge®* (*BABOK® Guide*) was reviewed by teams of both expert and practitioner reviewers. The Body of Knowledge Committee used the feedback provided to further enhance and refine the text and then made the content available to the business analysis community for review in 2014. The thousands of items of feedback from this public review were used to further revise the text to form *A Guide to the Business Analysis Body of Knowledge®* (*BABOK® Guide*) version 3.0.

The goal of this revision was to:

- incorporate new concepts and practices in use since the last revision,
- address the broadening and evolving scope of the profession,
- incorporate lessons learned from practitioners who have worked with the current version,
- improve the readability and usability of the guide,
- improve the consistency and quality of text and illustrations, and
- improve consistency with other generally accepted standards relating to the practice of business analysis.

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The major changes in this release include:

- the inclusion of the *Business Analysis Core Concept Model*™ (*BACCM*™),
- the expanded scope of the role of business analysis in creating better business outcomes,
- the inclusion of Perspectives which describe specialized ways in which business analysis professionals provide unique value to the enterprise,
- new and expanded Underlying Competencies to better reflect the diverse skill sets of the business analyst, and
- new techniques that have emerged in the practice of business analysis.

This publication supersedes *A Guide to the Business Analysis Body of Knowledge*® (*BABOK*® *Guide*) version 2.0.

The *BABOK*® *Guide* contains a description of generally accepted practices in the field of business analysis. The content included in this release has been verified through reviews by practitioners, surveys of the business analysis community, and consultations with recognized experts in the field. The data available to IIBA demonstrates that the tasks and techniques described in this publication are in use by a majority of business analysis practitioners. As a result, we can have confidence that the tasks and techniques described in the *BABOK*® *Guide* should be applicable in most contexts where business analysis is performed, most of the time.

The *BABOK*® *Guide* should not be construed to mandate that the practices described in this publication should be followed under all circumstances. Any set of practices must be tailored to the specific conditions under which business analysis is being performed. In addition, practices which are not generally accepted by the business analysis community at the time of publication may be equally effective, or more effective, than the practices described in the *BABOK*® *Guide*. As such practices become generally accepted, and as data is collected to verify their effectiveness, they will be incorporated into future editions of this publication. IIBA encourages all practitioners of business analysis to be open to new approaches and new ideas, and wishes to encourage innovation in the practice of business analysis.

IIBA would like to extend its thanks and the thanks of the business analysis community to all those who volunteered their time and effort to the development of this revision, as well as those who provided informal feedback to us in other ways.

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1 Introduction

A Guide to the Business Analysis Body of Knowledge® (*BABOK*® *Guide*) is the globally recognized standard for the practice of business analysis. The *BABOK*® *Guide* describes business analysis knowledge areas, tasks, underlying competencies, techniques and perspectives on how to approach business analysis.

1.1 Purpose of the BABOK® Guide

The primary purpose of the *BABOK*® *Guide* is to define the profession of business analysis and provide a set of commonly accepted practices. It helps practitioners discuss and define the skills necessary to effectively perform business analysis work. The *BABOK*® *Guide* also helps people who work with and employ business analysts to understand the skills and knowledge they should expect from a skilled practitioner.

Business analysis is a broad profession in which business analysts might perform work for many different types of initiatives across an enterprise. Practitioners may employ different competencies, knowledge, skills, terminology, and attitudes that they use when performing business analysis tasks. The *BABOK*® *Guide* is a common framework for all perspectives, describing business analysis tasks that are performed to properly analyze a change or evaluate the necessity for a change. Tasks may vary in form, order, or importance for individual business analysts or for various initiatives.

The six knowledge areas of the *BABOK*® *Guide* (Business Analysis Planning and Monitoring, Elicitation and Collaboration, Requirements Life Cycle Management, Strategy Analysis, Requirements Analysis and Design Definition (RADD), and

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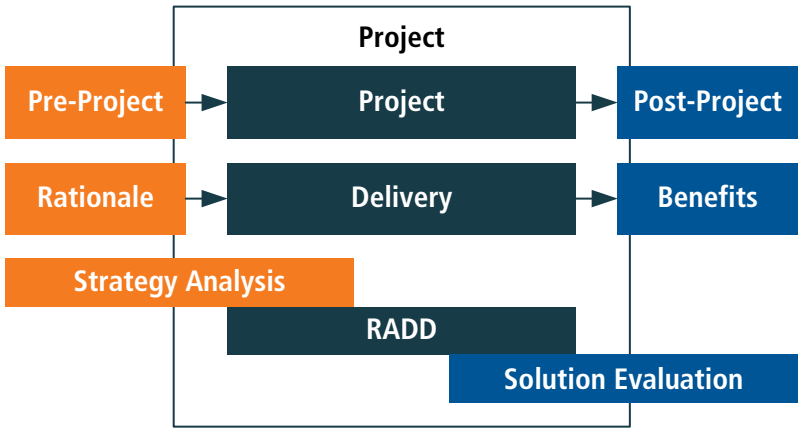
Solution Evaluation) describe the practice of business analysis as it is applied within the boundaries of a project or throughout enterprise evolution and continuous improvement. The following image shows how three of the knowledge areas support the delivery of business value before, during, and after the life cycle of a project.

Figure 1.1.1: Business Analysis Beyond Projects



1.2 What is Business Analysis?

Business analysis is the practice of enabling change in an enterprise by defining needs and recommending solutions that deliver value to stakeholders. Business analysis enables an enterprise to articulate needs and the rationale for change, and to design and describe solutions that can deliver value.

Business analysis is performed on a variety of initiatives within an enterprise. Initiatives may be strategic, tactical, or operational. Business analysis may be performed within the boundaries of a project or throughout enterprise evolution and continuous improvement. It can be used to understand the current state, to define the future state, and to determine the activities required to move from the current to the future state.

Business analysis can be performed from a diverse array of perspectives. The *BABOK® Guide* describes several of these perspectives: agile, business intelligence, information technology, business architecture, and business process management. A perspective can be thought of as a lens through which the business analysis practitioner views their work activities based on the current context. One or many perspectives may apply to an initiative, and the perspectives outlined in the *BABOK® Guide* do not represent all the contexts for business analysis or the complete set of business analysis disciplines.

1.3 Who is a Business Analyst?

A business analyst is any person who performs business analysis tasks described in the *BABOK® Guide*, no matter their job title or organizational role. Business analysts are responsible for discovering, synthesizing, and analyzing information

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from a variety of sources within an enterprise, including tools, processes, documentation, and stakeholders. The business analyst is responsible for eliciting the actual needs of stakeholders—which frequently involves investigating and clarifying their expressed desires—in order to determine underlying issues and causes.

Business analysts play a role in aligning the designed and delivered solutions with the needs of stakeholders. The activities that business analysts perform include:

- understanding enterprise problems and goals,
- analyzing needs and solutions,
- devising strategies,
- driving change, and
- facilitating stakeholder collaboration.

Other common job titles for people who perform business analysis include:

- business architect,
- business systems analyst,
- data analyst,
- enterprise analyst,
- management consultant,
- process analyst,
- product manager,
- product owner,
- requirements engineer, and
- systems analyst.

1.4 Structure of the BABOK® Guide

The core content of the *BABOK® Guide* is composed of business analysis tasks organized into knowledge areas. Knowledge areas are a collection of logically (but not sequentially) related tasks. These tasks describe specific activities that accomplish the purpose of their associated knowledge area.

The Business Analysis Key Concepts, Underlying Competencies, Techniques, and Perspectives sections form the extended content in the *BABOK® Guide* that helps guide business analysts to better perform business analysis tasks.

- **Business Analysis Key Concepts**: define the key terms needed to understand all other content, concepts, and ideas within the *BABOK® Guide*.
- **Underlying Competencies**: provide a description of the behaviours, characteristics, knowledge, and personal qualities that support the effective practice of business analysis.

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- **Techniques**: provide a means to perform business analysis tasks. The techniques described in the *BABOK® Guide* are intended to cover the most common and widespread techniques practiced within the business analysis community.
- **Perspectives**: describe various views of business analysis. Perspectives help business analysts working from various points of view to better perform business analysis tasks, given the context of the initiative.

1.4.1 Key Concepts

The Business Analysis Key Concepts chapter provides a basic understanding of the central ideas necessary for understanding the *BABOK® Guide.*

This chapter consists of:

- Business Analysis Core Concept Model™ (BACCM™)
- Key Terms
- Requirements Classification Schema
- Stakeholders
- Requirements and Design

1.4.2 Knowledge Areas

Knowledge areas represent areas of specific business analysis expertise that encompass several tasks.

The six knowledge areas are:

Each knowledge area includes a visual representation of its inputs and outputs.

- **Business Analysis Planning and Monitoring**: describes the tasks that business analysts perform to organize and coordinate the efforts of business analysts and stakeholders. These tasks produce outputs that are used as key inputs and guidelines for the other tasks throughout the *BABOK® Guide*.
- **Elicitation and Collaboration**: describes the tasks that business analysts perform to prepare for and conduct elicitation activities and confirm the results obtained. It also describes the communication with stakeholders once the business analysis information is assembled and the ongoing collaboration with them throughout the business analysis activities.
- **Requirements Life Cycle Management**: describes the tasks that business analysts perform in order to manage and maintain requirements and design information from inception to retirement. These tasks describe establishing meaningful relationships between related requirements and designs, and assessing, analyzing and gaining consensus on proposed changes to requirements and designs.
- **Strategy Analysis**: describes the business analysis work that must be performed to collaborate with stakeholders in order to identify a need of strategic or tactical importance (the business need), enable the enterprise to

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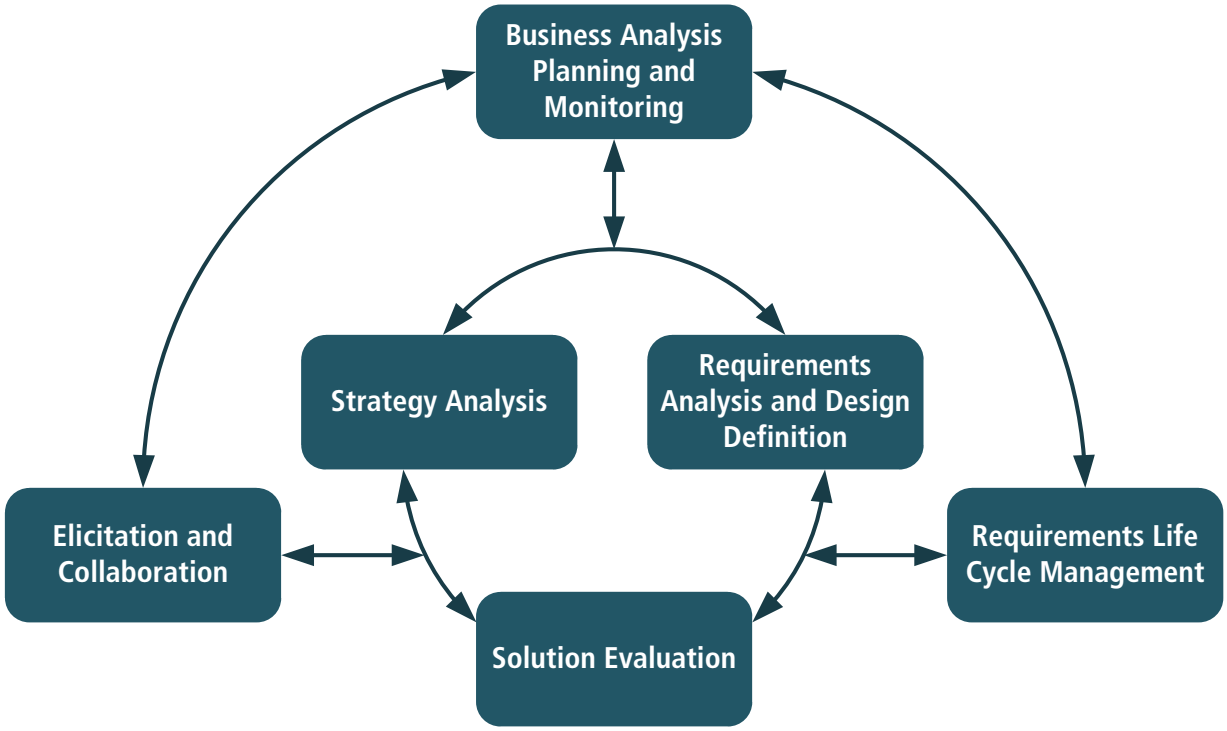
address that need, and align the resulting strategy for the change with higher- and lower-level strategies.

- **Requirements Analysis and Design Definition**: describes the tasks that business analysts perform to structure and organize requirements discovered during elicitation activities, specify and model requirements and designs, validate and verify information, identify solution options that meet business needs, and estimate the potential value that could be realized for each solution option. This knowledge area covers the incremental and iterative activities ranging from the initial concept and exploration of the need through the transformation of those needs into a particular recommended solution.
- **Solution Evaluation**: describes the tasks that business analysts perform to assess the performance of and value delivered by a solution in use by the enterprise, and to recommend removal of barriers or constraints that prevent the full realization of the value.

The following diagram shows a general relationship between the knowledge areas.

Figure 1.4.1: Relationships Between Knowledge Areas



1.4.3 Tasks

A task is a discrete piece of work that may be performed formally or informally as part of business analysis. The *BABOK® Guide* defines a list of business analysis tasks. The definition of a given task is universally applicable to business analysis efforts, independent of the initiative type. A business analyst may perform other

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activities as assigned by their organization, but these additional activities are not considered to be part of the business analysis profession.

Tasks are grouped into knowledge areas. Business analysts perform tasks from all knowledge areas sequentially, iteratively, or simultaneously. The *BABOK® Guide* does not prescribe a process or an order in which tasks are performed. Tasks may be performed in any order, as long as the necessary inputs to a task are present. A business analysis initiative may start with any task, although likely candidates are Analyze Current State (p. 103) or Measure Solution Performance (p. 166).

Each task in the *BABOK® Guide* is presented in the following format:

- Purpose
- Description
- Inputs
- Elements
- Guidelines/Tools
- Techniques
- Stakeholders
- Outputs

.1 Purpose

The Purpose section provides a short description of the reason for a business analyst to perform the task, and the value created through performing the task.

.2 Description

The Description section explains in greater detail what the task is, why it is performed, and what it should accomplish.

.3 Inputs

The Inputs section lists the inputs for the task. Inputs are information consumed or transformed to produce an output, and represent the information necessary for a task to begin. They may be explicitly generated outside the scope of business analysis or generated by a business analysis task. Inputs that are generated outside of the business analysis efforts are identified with the qualifier '(external)' in the input list.

There is no assumption that the presence of an input means that the associated deliverable is complete or in its final state. The input only needs to be sufficiently complete to allow successive work to begin. Any number of instances of an input may exist during the life cycle of an initiative.

The Inputs section includes a visual representation of the inputs and outputs, the other tasks that use the outputs, as well as the guidelines and tools listed in the task.

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.4 Elements

The Elements section describes the key concepts that are needed to understand how to perform the task. Elements are not mandatory as part of performing a task, and their usage might depend upon the business analysis approach.

.5 Guidelines and Tools

The Guidelines and Tools section lists resources that are required to transform the input into an output. A guideline provides instructions or descriptions on why or how to undertake a task. A tool is something used to undertake a task.

Guidelines and tools can include outputs of other tasks.

.6 Techniques

The Techniques section lists the techniques that can be used to perform the business analysis task.

.7 Stakeholders

The Stakeholders section is composed of a generic list of stakeholders who are likely to participate in performing that task or who will be affected by it. The *BABOK® Guide* does not mandate that these roles be filled for any given initiative.

.8 Outputs

The Outputs section describes the results produced by performing the task. Outputs are created, transformed, or changed in state as a result of the successful completion of a task. An output may be a deliverable or be a part of a larger deliverable. The form of an output is dependent on the type of initiative underway, standards adopted by the organization, and best judgment of the business analyst as to an appropriate way to address the information needs of key stakeholders.

As with inputs, an instance of a task may be completed without an output being in its final state. Tasks that use a specific output do not necessarily have to wait for its completion for work within the task to begin.

1.4.4 Underlying Competencies

Underlying competencies reflect knowledge, skills, behaviours, characteristics, and personal qualities that help one successfully perform the role of the business analyst. These underlying competencies are not unique to the business analysis profession. However, successful execution of tasks and techniques is often dependent on proficiency in one or more underlying competencies.

Underlying competencies have the following structure:

- Purpose
- Definition
- Effectiveness Measures

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.1 Purpose

The Purpose section describes why it is beneficial for business analysts to have this underlying competency.

.2 Definition

The Definition section describes the skills and expertise involved in the application of this competency.

.3 Effectiveness Measures

The Effectiveness Measures section describes how to determine whether a person is demonstrating skills in this underlying competency.

1.4.5 Techniques

Techniques provide additional information on ways that a task may be performed.

The list of techniques included in the *BABOK® Guide* is not exhaustive. There are multiple techniques that may be applied alternatively or in conjunction with other techniques to accomplish a task. Business analysts are encouraged to modify existing techniques or engineer new ones to best suit their situation and the goals of the tasks they perform.

Techniques have the following structure:

- Purpose
- Description
- Elements
- Usage Considerations

.1 Purpose

The Purpose section describes what the technique is used for and the circumstances under which it is most likely to be applicable.

.2 Description

The Description section describes what the technique is and how it is used.

.3 Elements

The Elements section describes key concepts that are needed to understand how to use the technique.

.4 Usage Considerations

The Usage Considerations section describes the conditions under which the technique may be more or less effective.

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1.4.6 Perspectives

Perspectives are used within business analysis work to provide focus to tasks and techniques specific to the context of the initiative. Most initiatives are likely to engage one or more perspectives. The perspectives included in the *BABOK® Guide* are:

- Agile
- Business Intelligence
- Information Technology
- Business Architecture
- Business Process Management

These perspectives do not presume to represent all the possible perspectives from which business analysis is practiced. The perspectives discussed in the *BABOK® Guide* represent some of the more common views of business analysis at the time of writing.

Perspectives are not mutually exclusive, in that a given initiative might employ more than one perspective.

Perspectives have the following structure:

- Change Scope
- Business Analysis Scope
- Methodologies, Approaches, and Techniques
- Underlying Competencies
- Impact on Knowledge Areas

.1 Change Scope

The Change Scope section describes what parts of the enterprise the change encompasses when viewed from this perspective and to what extent it impacts both the objectives and operations of the enterprise. The change scope also identifies the type of problems solved, the nature of the solutions being sought, and the approach to delivering these solutions and measuring their value.

.2 Business Analysis Scope

The Business Analysis Scope section describes the key stakeholders, including a profile of the likely types of sponsors, the target stakeholders, and the business analyst's role within an initiative. It also defines likely outcomes that would be expected from business analysis work in this perspective.

.3 Methodologies, Approaches, and Techniques

The composition of this section is unique to each perspective. In each case it describes the methodologies, approaches, or techniques that are common and specific to the application of business analysis in the perspective. Methodologies

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and approaches are specialized ways of undertaking the business analysis work. The techniques included in this section are techniques that are not included in the Techniques chapter of the *BABOK® Guide* but are especially relevant to the perspective.

In the Business Architecture perspective, reference models are listed instead of methodologies or approaches. In the Business Process Management perspective, frameworks are listed instead of approaches.

.4 Underlying Competencies

The Underlying Competencies section describes the competencies that are most prevalent in the perspective.

.5 Impact on Knowledge Areas

The Impact on Knowledge Areas section describes how knowledge areas are applied or modified. It also explains how specific activities within a perspective are mapped to tasks in the *BABOK® Guide*.

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2 Business Analysis Key Concepts

The Business Analysis Key Concepts chapter includes information that provides a foundation for all other content, concepts, and ideas within the *BABOK® Guide*. It provides business analysts with a basic understanding of the central ideas necessary for understanding and employing the *BABOK® Guide* in their daily practice of business analysis.

This chapter consists of:

- **Business Analysis Core Concept Model™ (BACCM™)**: defines a conceptual framework for the business analysis profession.
- **Key Terms**: provides definitions of essential concepts, which are highlighted because of their importance to the *BABOK® Guide*.
- **Requirements Classification Schema**: identifies levels or types of requirements that assist the business analyst and other stakeholders in categorizing requirements.
- **Stakeholders**: defines roles, and characteristics of groups or individuals participating in or affected by the business analysis activities within a change.
- **Requirements and Designs**: describes the distinction between—and the importance of—requirements and designs as they relate to business analysis.

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2.1 The Business Analysis Core Concept Model™

The *Business Analysis Core Concept Model*™ (*BACCM*™) is a conceptual framework for business analysis. It encompasses what business analysis is and what it means to those performing business analysis tasks regardless of perspective, industry, methodology, or level in the organization. It is composed of six terms that have a common meaning to all business analysts and helps them discuss both business analysis and its relationships with common terminology. Each of these terms is considered to be a core concept.

The six core concepts in the *BACCM* are: Change, Need, Solution, Stakeholder, Value, and Context. Each core concept is an idea fundamental to the practice of business analysis, and all the concepts are equal and necessary. Each core concept is defined by the other five core concepts and cannot be fully understood until all the concepts are understood. No single concept holds greater importance or significance over any other concept. These concepts are instrumental to understanding the type of information elicited, analyzed, or managed in business analysis tasks.

The *BACCM* can be used to:

- describe the profession and domain of business analysis,
- communicate about business analysis with a common terminology,
- evaluate the relationships of key concepts in business analysis,
- perform better business analysis by holistically evaluating the relationships among these six concepts, and
- evaluate the impact of these concepts and relationships at any point during a work effort in order to establish both a foundation and a path forward.

Table 2.1.1: The BACCM

Core Concept	Description
Change	The act of transformation in response to a need. Change works to improve the performance of an enterprise. These improvements are deliberate and controlled through business analysis activities.
Need	A problem or opportunity to be addressed. Needs can cause changes by motivating stakeholders to act. Changes can also cause needs by eroding or enhancing the value delivered by existing solutions.
Solution	A specific way of satisfying one or more needs in a context. A solution satisfies a need by resolving a problem faced by stakeholders or enabling stakeholders to take advantage of an opportunity.

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Table 2.1.1: The BACCM (Continued)

Core Concept	Description
Stakeholder	A group or individual with a relationship to the change, the need, or the solution. Stakeholders are often defined in terms of interest in, impact on, and influence over the change. Stakeholders are grouped based on their relationship to the needs, changes, and solutions.
Value	The worth, importance, or usefulness of something to a stakeholder within a context. Value can be seen as potential or realized returns, gains, and improvements. It is also possible to have a decrease in value in the form of losses, risks, and costs. Value can be tangible or intangible. Tangible value is directly measurable. Tangible value often has a significant monetary component. Intangible value is measured indirectly. Intangible value often has a significant motivational component, such as a company's reputation or employee morale. In some cases, value can be assessed in absolute terms, but in many cases is assessed in relative terms: one solution option is more valuable than another from the perspective of a given set of stakeholders.
Context	The circumstances that influence, are influenced by, and provide understanding of the change. Changes occur within a context. The context is everything relevant to the change that is within the environment. Context may include attitudes, behaviours, beliefs, competitors, culture, demographics, goals, governments, infrastructure, languages, losses, processes, products, projects, sales, seasons, terminology, technology, weather, and any other element meeting the definition.

The core concepts can be used by business analysts to consider the quality and completeness of the work being done. Within each knowledge area description there are examples of how the core concepts may be used and/or applied during the tasks within the knowledge area. While planning or performing a task or technique, business analysts can consider how each core concept is addressed by asking questions such as:

- What are the kinds of *changes* we are doing?
- What are the *needs* we are trying to satisfy?
- What are the *solutions* we are creating or changing?

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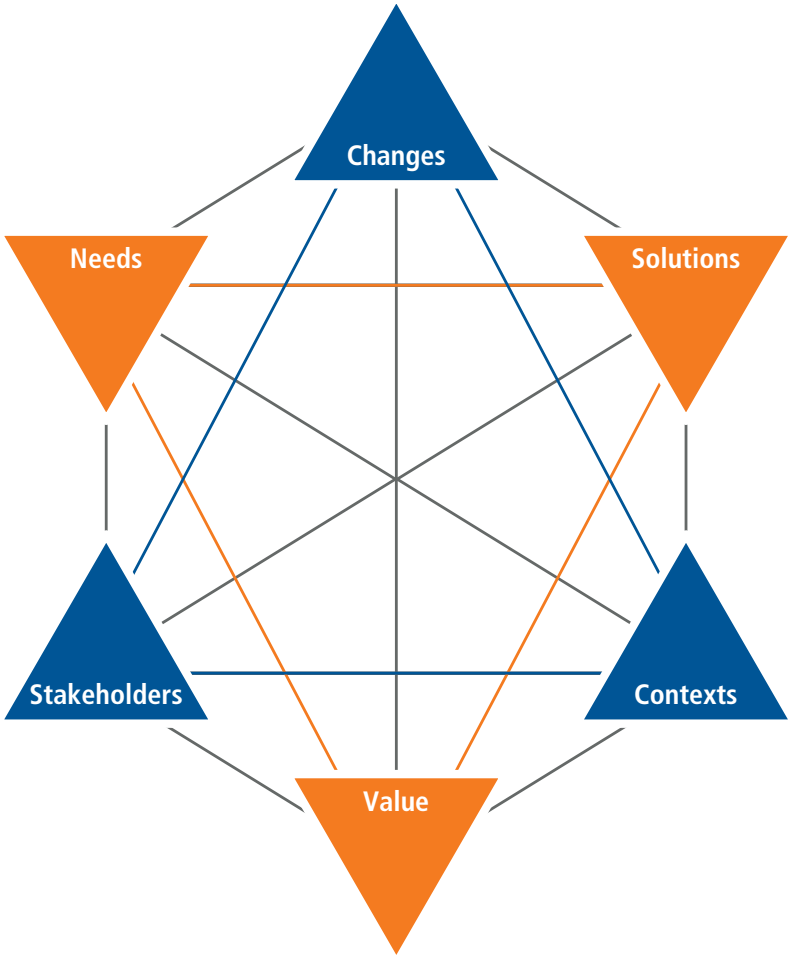
- Who are the *stakeholders* involved?
- What do stakeholders consider to be of *value*?
- What are the *contexts* that we and the solution are in?

If any of the core concepts experience a change, it should cause us to re-evaluate these core concepts and their relationships to value delivery.

Figure 2.1.1: The BACCM



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2.2 Key Terms

Business Analysis

The *BABOK® Guide* describes and defines business analysis as the practice of enabling change in an enterprise by defining needs and recommending solutions that deliver value to stakeholders.

Business Analysis Information

Business analysis information refers to the broad and diverse sets of information that business analysts analyze, transform, and report. It is information of any

kind—at any level of detail—that is used as an input to, or is an output of, business analysis work. Examples of business analysis information include elicitation results, requirements, designs, solution options, solution scope, and change strategy.

It is essential to expand the object of many business analysis activities from 'requirements' to 'information' to ensure that all inputs and outputs of business analysis are subject to the tasks and activities described in the *BABOK® Guide*. For example, when performing 'Plan Business Analysis Information Management' it includes all the examples listed above. If the *BABOK® Guide* described 'Plan Requirements Management', it would exclude important outputs like elicitation results, solution options, and change strategy.

Design

A design is a usable representation of a solution. Design focuses on understanding how value might be realized by a solution if it is built. The nature of the representation may be a document (or set of documents) and can vary widely depending on the circumstances.

Enterprise

An enterprise is a system of one or more organizations and the solutions they use to pursue a shared set of common goals. These solutions (also referred to as organizational capabilities) can be processes, tools or information. For the purpose of business analysis, enterprise boundaries can be defined relative to the change and need not be constrained by the boundaries of a legal entity, organization, or organizational unit. An enterprise may include any number of business, government, or any other type of organization.

Organization

An autonomous group of people under the management of a single individual or board, that works towards common goals and objectives. Organizations often have a clearly defined boundary and operate on a continuous basis, as opposed to an initiative or project team, which may be disbanded once its objectives are achieved.

Plan

A plan is a proposal for doing or achieving something. Plans describe a set of events, the dependencies among the events, the expected sequence, the schedule, the results or outcomes, the materials and resources needed, and the stakeholders involved.

Requirement

A requirement is a usable representation of a need. Requirements focus on understanding what kind of value could be delivered if a requirement is fulfilled. The nature of the representation may be a document (or set of documents), but can vary widely depending on the circumstances.

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Risk

Risk is the effect of uncertainty on the value of a change, a solution, or the enterprise. Business analysts collaborate with other stakeholders to identify, assess, and prioritize risks, and to deal with those risks by altering the likelihood of the conditions or events that lead to the uncertainty: mitigating the consequences, removing the source of the risk, avoiding the risk altogether by deciding not to start or continue with an activity that leads to the risk, sharing the risk with other parties, or accepting or even increasing the risk to deal with an opportunity.

2.3 Requirements Classification Schema

For the purposes of the *BABOK® Guide*, the following classification schema describes requirements:

- **Business requirements**: statements of goals, objectives, and outcomes that describe why a change has been initiated. They can apply to the whole of an enterprise, a business area, or a specific initiative.
- **Stakeholder requirements**: describe the needs of stakeholders that must be met in order to achieve the business requirements. They may serve as a bridge between business and solution requirements.
- **Solution requirements**: describe the capabilities and qualities of a solution that meets the stakeholder requirements. They provide the appropriate level of detail to allow for the development and implementation of the solution. Solution requirements can be divided into two sub-categories:
  - **functional requirements**: describe the capabilities that a solution must have in terms of the behaviour and information that the solution will manage, and
  - **non-functional requirements or quality of service requirements**: do not relate directly to the behaviour of functionality of the solution, but rather describe conditions under which a solution must remain effective or qualities that a solution must have.
- **Transition requirements**: describe the capabilities that the solution must have and the conditions the solution must meet to facilitate transition from the current state to the future state, but which are not needed once the change is complete. They are differentiated from other requirements types because they are of a temporary nature. Transition requirements address topics such as data conversion, training, and business continuity.

2.4 Stakeholders

Each task includes a list of stakeholders who are likely to participate in the execution of that task or who will be affected by it. A stakeholder is an individual or group that a business analyst is likely to interact with directly or indirectly. The

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BABOK® Guide does not mandate that these roles be filled for any given initiative. Any stakeholder can be a source of requirements, assumptions, or constraints.

This list is not intended to be an exhaustive list of all possible stakeholder classifications. Some additional examples of people who fit into each of these generic roles are listed in the definitions below. In most cases there will be multiple stakeholder roles found within each category. Similarly, a single individual may fill more than one role.

For the purpose of the *BABOK® Guide*, the generic list of stakeholders includes the following roles:

- business analyst,
- customer,
- domain subject matter expert,
- end user,
- implementation subject matter expert,
- operational support,
- project manager,
- regulator,
- sponsor,
- supplier, and
- tester.

2.4.1 Business Analyst

The business analyst is inherently a stakeholder in all business analysis activities. The *BABOK® Guide* presumes that the business analyst is responsible and accountable for the execution of these activities. In some cases the business analyst may also be responsible for performing activities that fall under another stakeholder role.

2.4.2 Customer

A customer uses or may use products or services produced by the enterprise and may have contractual or moral rights that the enterprise is obliged to meet.

2.4.3 Domain Subject Matter Expert

A domain subject matter expert is any individual with in-depth knowledge of a topic relevant to the business need or solution scope. This role is often filled by people who may be end users or people who have in-depth knowledge of the solution such as managers, process owners, legal staff, consultants, and others.

2.4.4 End User

End users are stakeholders who directly interact with the solution. End users can include all participants in a business process, or who use the product or solution.

2.4.5 Implementation Subject Matter Expert

An implementation subject matter expert is any stakeholder who has specialized knowledge regarding the implementation of one or more solution components.

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While it is not possible to define a listing of implementation subject matter expert roles that are appropriate for all initiatives, some of the most common roles are: project librarian, change manager, configuration manager, solution architect, developer, database administrator, information architect, usability analyst, trainer, and organizational change consultant.

2.4.6 Operational Support

Operational support is responsible for the day-to-day management and maintenance of a system or product.

While it is not possible to define a listing of operational support roles that are appropriate for all initiatives, some of the most common roles are: operations analyst, product analyst, help desk, and release manager.

2.4.7 Project Manager

Project managers are responsible for managing the work required to deliver a solution that meets a business need, and for ensuring that the project's objectives are met while balancing the project factors including scope, budget, schedule, resources, quality, and risk.

While it is not possible to completely define a listing of project management roles that are appropriate for all initiatives, some of the most common roles are: project lead, technical lead, product manager, and team leader.

2.4.8 Regulator

Regulators are responsible for the definition and enforcement of standards. Standards can be imposed on the solution by regulators through legislation, corporate governance standards, audit standards, or standards defined by organizational centers of competency. Alternate roles are government, regulatory bodies, and auditor.

2.4.9 Sponsor

Sponsors are responsible for initiating the effort to define a business need and develop a solution that meets that need. They authorize the work to be performed, and control the budget and scope for the initiative. Alternate roles are executive and project sponsor.

2.4.10 Supplier

A supplier is a stakeholder outside the boundary of a given organization or organizational unit. Suppliers provide products or services to the organization and may have contractual or moral rights and obligations that must be considered. Alternate roles are providers, vendors, and consultants.

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2.4.11 Tester

Testers are responsible for determining how to verify that the solution meets the requirements defined by the business analyst, as well as conducting the verification process. Testers also seek to ensure that the solution meets applicable quality standards, and that the risk of defects or failures is understood and minimized. An alternate role is quality assurance analyst.

2.5 Requirements and Designs

Eliciting, analyzing, validating, and managing requirements have consistently been recognized as key activities of business analysis. However, it is important to recognize that business analysts are also responsible for the definition of design, at some level, in an initiative. The level of responsibility for design varies based on the perspective within which a business analyst is working.

Requirements are focused on the need; designs are focused on the solution. The distinction between requirements and designs is not always clear. The same techniques are used to elicit, model, and analyze both. A requirement leads to a design which in turn may drive the discovery and analysis of more requirements. The shift in focus is often subtle.

The classification as a requirement or a design may become less significant as the business analyst's work progresses to a greater understanding of and eventual fulfillment of the need. The tasks in the *BABOK® Guide* such as Trace Requirements (p. 79) or Specify and Model Requirements (p. 136) may refer to requirements, but the intent is to include designs as well.

Business analysis can be complex and recursive. A requirement (or set of requirements) may be used to define a design. That design may then be used to elicit additional requirements that are used to define more detailed designs. The business analyst may hand off requirements and designs to other stakeholders who may further elaborate on the designs. Whether it is the business analyst or some other role that completes the designs, the business analyst often reviews the final designs to ensure that they align with the requirements.

The following table provides some basic examples of how information may be viewed as either a requirement or a design.

Table 2.5.1: Requirements and Design

Requirement	Design
View six months sales data across multiple organizational units in a single view.	A sketch of a dashboard.
Reduce amount of time required to pick and pack a customer order.	Process model.
Record and access a medical patient's history.	Screen mock-up showing specific data fields.

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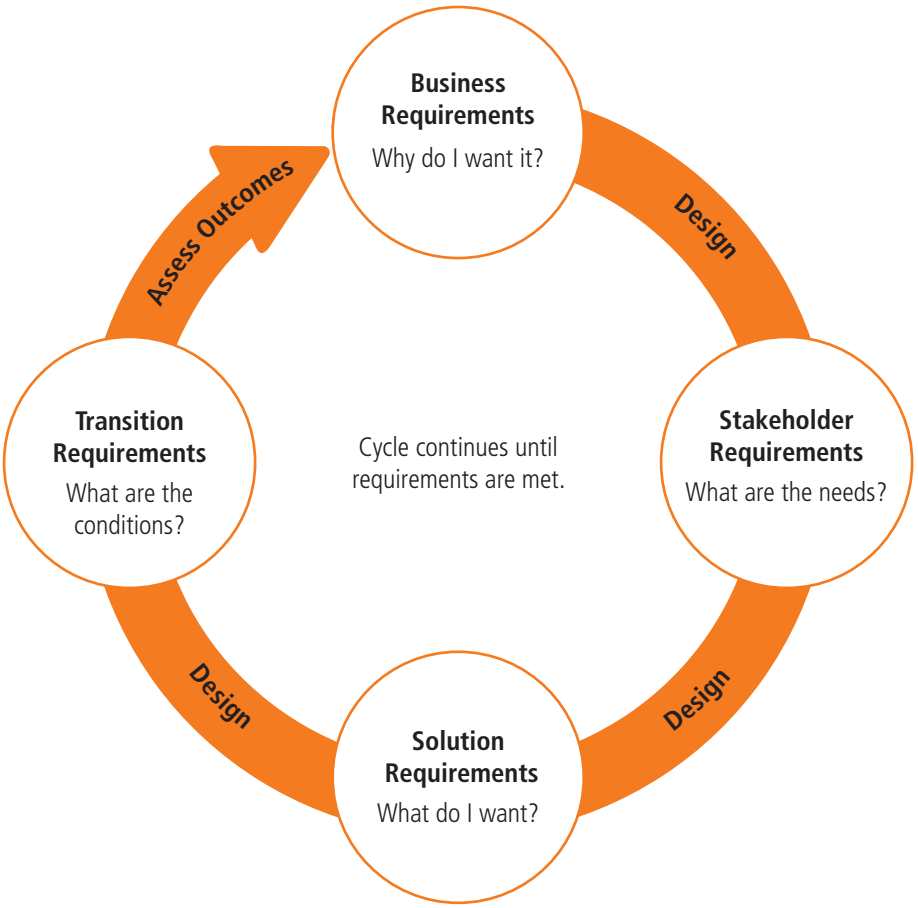
Table 2.5.1: Requirements and Design (Continued)

Requirement	Design
Develop business strategy, goals, and objectives for a new business.	Business Capability Model.
Provide information in English and French.	Prototype with text displayed in English and French.

Stakeholders may present a need or a solution to an assumed need. A business analyst uses activities found in Elicitation and Collaboration (p. 53), Strategy Analysis (p. 99), Requirements Analysis and Design Definition (p. 133), and Solution Evaluation (p. 163) to transform that request into a requirement or design. Regardless of the focus of the stakeholder, the importance of the role of the business analyst lies in continuously asking the question 'why?'. For example, "Why is either the requirement or design necessary to provide value to an enterprise and to facilitate the realization of an enterprise's goals and objectives?"

Figure 2.5.1: Requirements and Design Cycle



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3 Business Analysis Planning and Monitoring

The Business Analysis Planning and Monitoring knowledge area tasks organize and coordinate the efforts of business analysts and stakeholders. These tasks produce outputs that are used as key guidelines for the other tasks throughout the *BABOK® Guide*.

The Business Analysis Planning and Monitoring knowledge area includes the following tasks:

- **Plan Business Analysis Approach**: describes the planning of business analysis work from creation or selection of a methodology to planning the individual activities, tasks, and deliverables.
- **Plan Stakeholder Engagement**: describes understanding which stakeholders are relevant to the change, what business analysts need from them, what they need from business analysts, and the best way to collaborate.
- **Plan Business Analysis Governance**: defines the components of business analysis that are used to support the governance function of the organization. It helps ensure that decisions are made properly and consistently, and follows a process that ensures decision makers have the information they need. Examples of this include requirements management, business analysis risk management, and allocation of business analysis resources.
- **Plan Business Analysis Information Management**: defines how information developed by business analysts (including requirements and designs) is captured, stored, and integrated with other information for long-term use.

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- **Identify Business Analysis Performance Improvements**: describes managing and monitoring how business analysis work is performed to ensure that commitments are met and continuous learning and improvement opportunities are realized.

The Core Concept Model in Business Analysis Planning and Monitoring

The *Business Analysis Core Concept Model*™ (*BACCM*™) describes the relationships among the six core concepts. The following table describes the usage and application of each of the core concepts within the context of Business Analysis Planning and Monitoring.

Table 3.0.1: The Core Concept Model in Business Analysis Planning and Monitoring

Core Concept	During Business Analysis Planning and Monitoring, business analysts...
Change: the act of transformation in response to a need.	are responsible for determining how changes to business analysis results will be requested and authorized.
Need: a problem or opportunity to be addressed.	choose a business analysis approach that provides adequate analysis for the change.
Solution: a specific way of satisfying one or more needs in a context.	evaluate if business analysis performance was a key contributor to the successful implementation of a solution.
Stakeholder: a group or individual with a relationship to the change, the need, or the solution.	perform a stakeholder analysis to ensure planning and monitoring activities reflect stakeholder needs and account for stakeholder characteristics.
Value: the worth, importance, or usefulness of something to a stakeholder within a context.	conduct performance analysis to ensure business analysis activities continue to produce sufficient value for the stakeholders.
Context: the circumstances that influence, are influenced by, and provide understanding of the change.	ensure a complete understanding of the context under analysis in order to develop an efficient business analysis approach.

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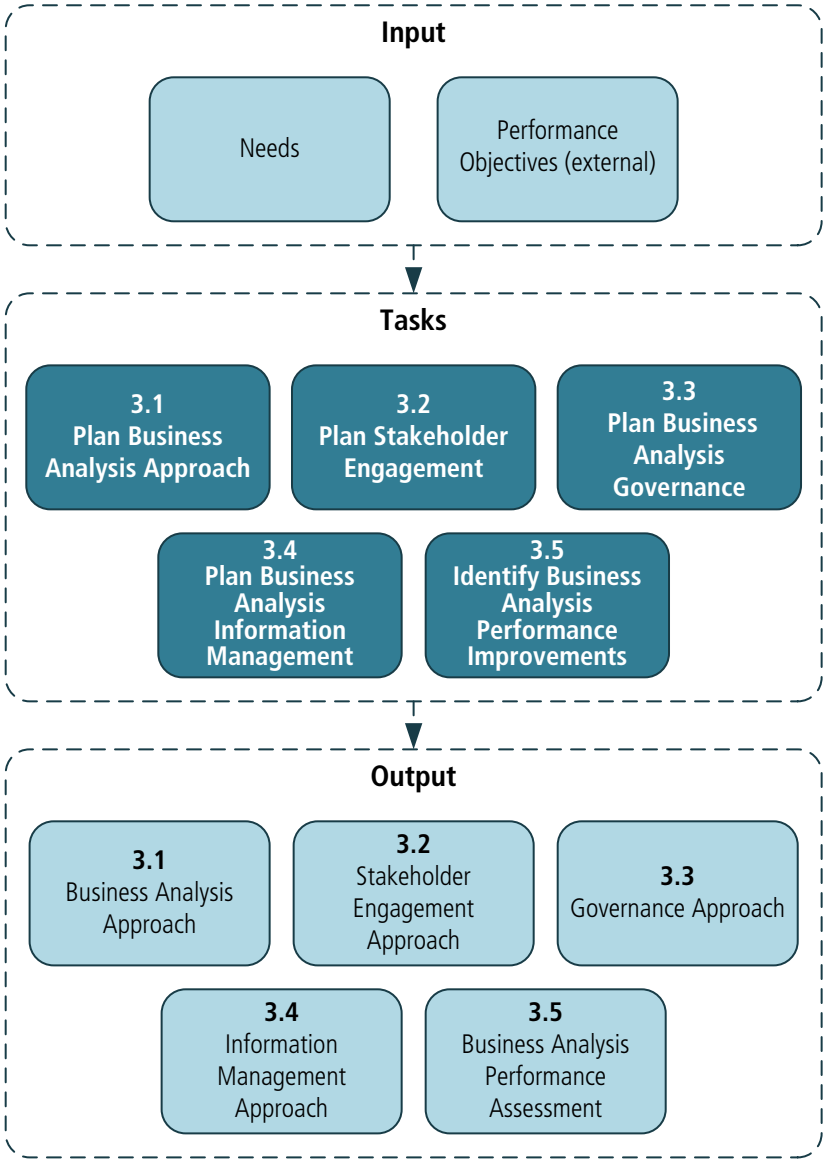
Figure 3.0.1: Business Analysis Planning and Monitoring Input/Output Diagram



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3.1 Plan Business Analysis Approach

3.1.1 Purpose

The purpose of Plan Business Analysis Approach is to define an appropriate method to conduct business analysis activities.

3.1.2 Description

Business analysis approaches describe the overall method that will be followed when performing business analysis work on a given initiative, how and when tasks will be performed, and the deliverables that will be produced.

The business analyst may also identify an initial set of techniques to use. This list may change as the initiative proceeds and the business analyst gains a deeper understanding of the change and its stakeholders.

The business analysis approach may be defined by a methodology or by organizational standards. In some organizations, elements of the business analysis approach may be standardized and formalized into a repeatable business analysis process which can be leveraged for each effort. Even where a standard approach exists, it may be tailored to the needs of a specific initiative. Tailoring may be governed by standards that define which approaches are permitted, which elements of those processes may be tailored, and general guidelines for selecting a process.

If organizational standards do not exist, the business analyst works with the appropriate stakeholders to determine how the work will be completed. For example, if the change is delivered via a project, the standards and approach may be developed during the project planning phase.

The business analysis approach should:

- align to the overall goals of the change,
- coordinate the business analysis tasks with the activities and deliverables of the overall change,
- include tasks to manage any risks that could reduce the quality of business analysis deliverables or impede task efficiency, and
- leverage approaches and select techniques and tools that have historically worked well.

3.1.3 Inputs

- **Needs**: the business analysis approach is shaped by the problem or opportunity faced by the organization. It is necessary to consider what is known about the need at the time of planning, while acknowledging that understanding evolves throughout business analysis activities.

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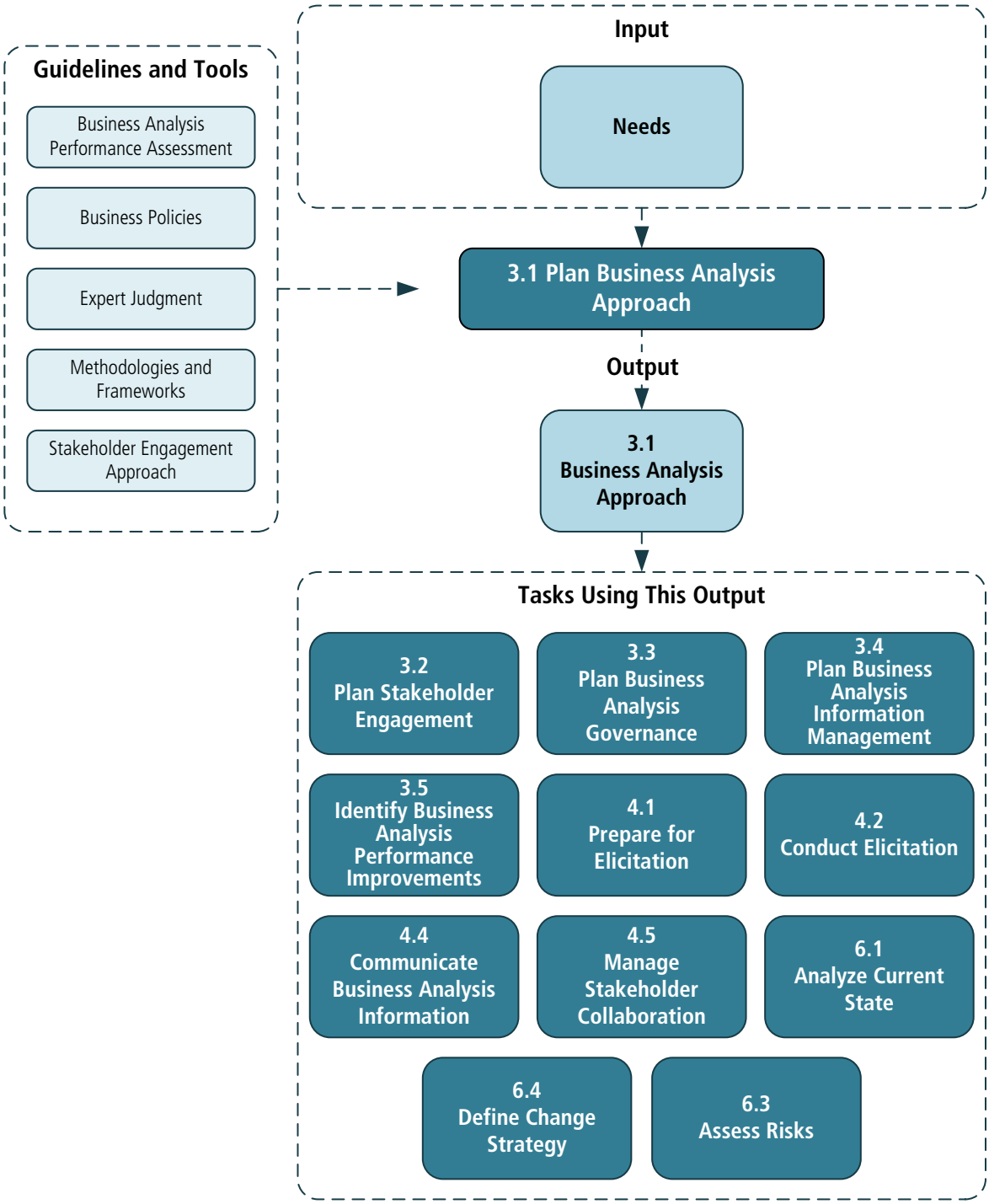
Figure 3.1.1: Plan Business Analysis Approach Input/Output Diagram



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3.1.4 Elements

.1 Planning Approach

There are various planning methods used across perspectives, industries, and enterprises. Many planning methods fit somewhere along a continuum between predictive and adaptive approaches.

Predictive approaches focus on minimizing upfront uncertainty and ensuring that the solution is defined before implementation begins in order to maximize control and minimize risk. These approaches are often preferred in situations where requirements can effectively be defined ahead of implementation, the risk of an incorrect implementation is unacceptably high, or when engaging stakeholders presents significant challenges.

Adaptive approaches focus on rapid delivery of business value in short iterations in return for acceptance of a higher degree of uncertainty regarding the overall delivery of the solution. These approaches tend to be preferred when taking an exploratory approach to finding the best solution or for incremental improvement of an existing solution.

Different approaches may be used within the same initiative. Among other factors, the business analyst may consider the organization's standards, tolerance for uncertainty, and previous experience with different approaches when planning for business analysis activities.

Regardless of the approach, planning is an essential task to ensure value is delivered to an enterprise. Planning typically occurs more than once on a given initiative as plans are updated to address changing business conditions and newly raised issues. The business analysis approach should describe how plans will be altered if changes are required.

.2 Formality and Level of Detail of Business Analysis Deliverables

When defining the business analysis approach, consider the level of formality that is appropriate for approaching and planning the initiative.

Predictive approaches typically call for formal documentation and representations. Business analysis information may be captured in a formal document or set of representations following standardized templates. Information is captured at various levels of detail. The specific content and format of business analysis information can vary depending on the organizational methodologies, processes, and templates in use.

Adaptive approaches favour defining requirements and designs through team interaction and gathering feedback on a working solution. Mandatory requirements representations are often limited to a prioritized requirements list. Additional business analysis documentation may be created at the discretion of the team, and generally consists of models developed to enhance the team's understanding of a specific problem. Formal documentation is often produced after the solution is implemented to facilitate knowledge transfer.

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Other considerations that may affect the approach include:

- the change is complex and high risk,
- the organization is in, or interacts with, heavily regulated industries,
- contracts or agreements necessitate formality,
- stakeholders are geographically distributed,
- resources are outsourced,
- staff turnover is high and/or team members may be inexperienced,
- requirements must be formally signed off, and
- business analysis information must be maintained long-term or handed over for use on future initiatives.

Figure 3.1.2: Formality and Level of Detail of Business Analysis Deliverables

	Approach	
	Predictive	**Adaptive**
Solution Definition	Defined before implementation to maximize control and minimize risk.	Defined in iterations to arrive at best solution or improve an existing solution.
Level of Formality	Formal—information is captured in standardized templates.	Informal—information is gathered through team interaction and feedback.
Activities	Activities required to complete deliverables are identified first and then divided into tasks.	Activities are divided into iterations with deliverables first and then the associated tasks are identified.
Timing	Tasks are performed in specific phases.	Tasks are performed iteratively.

.3 Business Analysis Activities

A business analysis approach provides a description of the types of activities that the business analyst will perform. Frequently the organization's adopted methodologies influence the activities that are selected.

Integrating business analysis activities in the business analysis approach includes:

- identifying the activities required to complete each deliverable and then breaking each activity into tasks,
- dividing the work into iterations, identifying the deliverables for each iteration, and then identifying the associated activities and tasks, or

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- using a previous similar initiative as an outline and applying the detailed tasks and activities unique to the current initiative.

.4 Timing of Business Analysis Work

Business analysts determine when the business analysis tasks need to be performed and if the level of business analysis effort will need to vary over time. This type of planning includes determining whether the business analysis tasks performed within the other knowledge areas will be performed primarily in specific phases or iteratively over the course of the initiative.

The timing of business analysis activities can also be affected by:

- the availability of resources,
- priority and/or urgency of the initiative,
- other concurrent initiatives, or
- constraints such as contract terms or regulatory deadlines.

.5 Complexity and Risk

The complexity and size of the change and the overall risk of the effort to the organization are considered when determining the business analysis approach. As complexity and risk increase or decrease, the nature and scope of business analysis work can be altered and reflected in the approach.

The approach may also be altered based on the number of stakeholders or business analysis resources involved in the initiative. As the number of stakeholders increases, the approach may be adjusted to include additional process steps to better manage the business analysis work.

Other factors that can impact complexity include:

- size of the change,
- number of business areas or systems affected,
- geographic and cultural considerations,
- technological complexities, and
- any risks that could impede the business analysis effort.

Factors that can impact the risk level of a business analysis effort include:

- experience level of the business analyst,
- extent of domain knowledge held by the business analyst,
- level of experience stakeholders have in communicating their needs,
- stakeholder attitudes about the change and business analysis in general,
- amount of time allocated by stakeholders to the business analysis activities,
- any pre-selected framework, methodology, tools, and/or techniques

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imposed by organizational policies and practices, and

- cultural norms of the organization.

.6 Acceptance

The business analysis approach is reviewed and agreed upon by key stakeholders. In some organizations, the business analysis process may be more structured and require key stakeholders to sign off on the approach to ensure all business analysis activities have been identified, estimates are realistic, and the proposed roles and responsibilities are correct. Any issues raised by stakeholders when reviewing the approach are documented by the business analyst and resolutions are sought. Stakeholders also play a role in reviewing and accepting changes to the approach as alterations are made to accommodate changing conditions across the initiative.

3.1.5 Guidelines and Tools

- **Business Analysis Performance Assessment**: provides results of previous assessments that should be reviewed and incorporated into all planning approaches.
- **Business Policies**: define the limits within which decisions must be made. They may be described by regulations, contracts, agreements, deals, warranties, certifications, or other legal obligations. These policies can influence the business analysis approach.
- **Expert Judgment**: used to determine the optimal business analysis approach. Expertise may be provided from a wide range of sources including stakeholders on the initiative, organizational Centres of Excellence, consultants, or associations and industry groups. Prior experiences of the business analyst and other stakeholders should be considered when selecting or modifying an approach.
- **Methodologies and Frameworks**: shape the approach that will be used by providing methods, techniques, procedures, working concepts, and rules. They may need to be tailored to better meet the needs of the specific business challenge.
- **Stakeholder Engagement Approach**: understanding the stakeholders and their concerns and interests may influence decisions made when determining the business analysis approach.

3.1.6 Techniques

- **Brainstorming**: used to identify possible business analysis activities, techniques, risks and other relevant items to help build the business analysis approach.
- **Business Cases**: used to understand whether elements of the problem or opportunity are especially time-sensitive, high-value, or whether there is any particular uncertainty around elements of the possible need or solution.

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- **Document Analysis**: used to review existing organizational assets that might assist in planning the approach.
- **Estimation**: used to determine how long it may take to perform business analysis activities.
- **Financial Analysis**: used to assess how different approaches (and the supported delivery options) affect the value delivered.
- **Functional Decomposition**: used to break down complex business analysis processes or approaches into more feasible components.
- **Interviews**: used to help build the plan with an individual or small group.
- **Item Tracking**: used to track any issues raised during planning activities with stakeholders. Can also track risk related items raised during discussions when building the approach.
- **Lessons Learned**: used to identify an enterprise's previous experience (both successes and challenges) with planning business analysis approach.
- **Process Modelling**: used to define and document the business analysis approach.
- **Reviews**: used to validate the selected business analysis approach with stakeholders.
- **Risk Analysis and Management**: used to assess risks in order to select the proper business analysis approach.
- **Scope Modelling**: used to determine the boundaries of the solution as an input to planning and to estimating.
- **Survey or Questionnaire**: used to identify possible business analysis activities, techniques, risks and other relevant items to help build the business analysis approach.
- **Workshops**: used to help build the plan in a team setting.

3.1.7 Stakeholders

- **Domain Subject Matter Expert**: can be a source of risk when their involvement is required and availability is lacking. The approach taken may depend on availability and level of their involvement with the initiative.
- **Project Manager**: determines that the approach is realistic for the overall schedule and timelines. The business analysis approach must be compatible with other activities.
- **Regulator**: may be needed to provide approval for aspects of the business analysis approach or decisions made in tailoring the process, especially in organizations where the business analysis process is audited.
- **Sponsor**: can provide needs and objectives for the approach and ensures that organizational policies are followed. The selected approach may depend on availability and involvement with the initiative.

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3.1.8 Outputs

- **Business Analysis Approach**: identifies the business analysis approach and activities that will be performed across an initiative including who will perform the activities, the timing and sequencing of the work, the deliverables that will be produced and the business analysis techniques that may be utilized. The remaining outputs of the Business Analysis Planning and Monitoring knowledge area may be integrated into an overall approach or be independent based upon methodology, organization, and perspective.

3.2 Plan Stakeholder Engagement

3.2.1 Purpose

The purpose of Plan Stakeholder Engagement is to plan an approach for establishing and maintaining effective working relationships with the stakeholders.

3.2.2 Description

Plan Stakeholder Engagement involves conducting a thorough stakeholder analysis to identify all of the involved stakeholders and analyze their characteristics. The results of the analysis are then utilized to define the best collaboration and communication approaches for the initiative and to appropriately plan for stakeholder risks.

When planning for stakeholder engagement, the degree of complexity can increase disproportionately as the number of stakeholders involved in the business analysis activities increases. This is important because new or different techniques for the management of stakeholders may be required when the engagement moves from collaborating with a few stakeholders into dozens, hundreds, or even thousands of people.

3.2.3 Inputs

- **Needs**: understanding the business need and the parts of the enterprise that it affects helps in the identification of stakeholders. The need may evolve as stakeholder analysis is performed.
- **Business Analysis Approach**: incorporating the overall business analysis approach into the stakeholder analysis, collaboration, and communication approaches is necessary to ensure consistency across the approaches.

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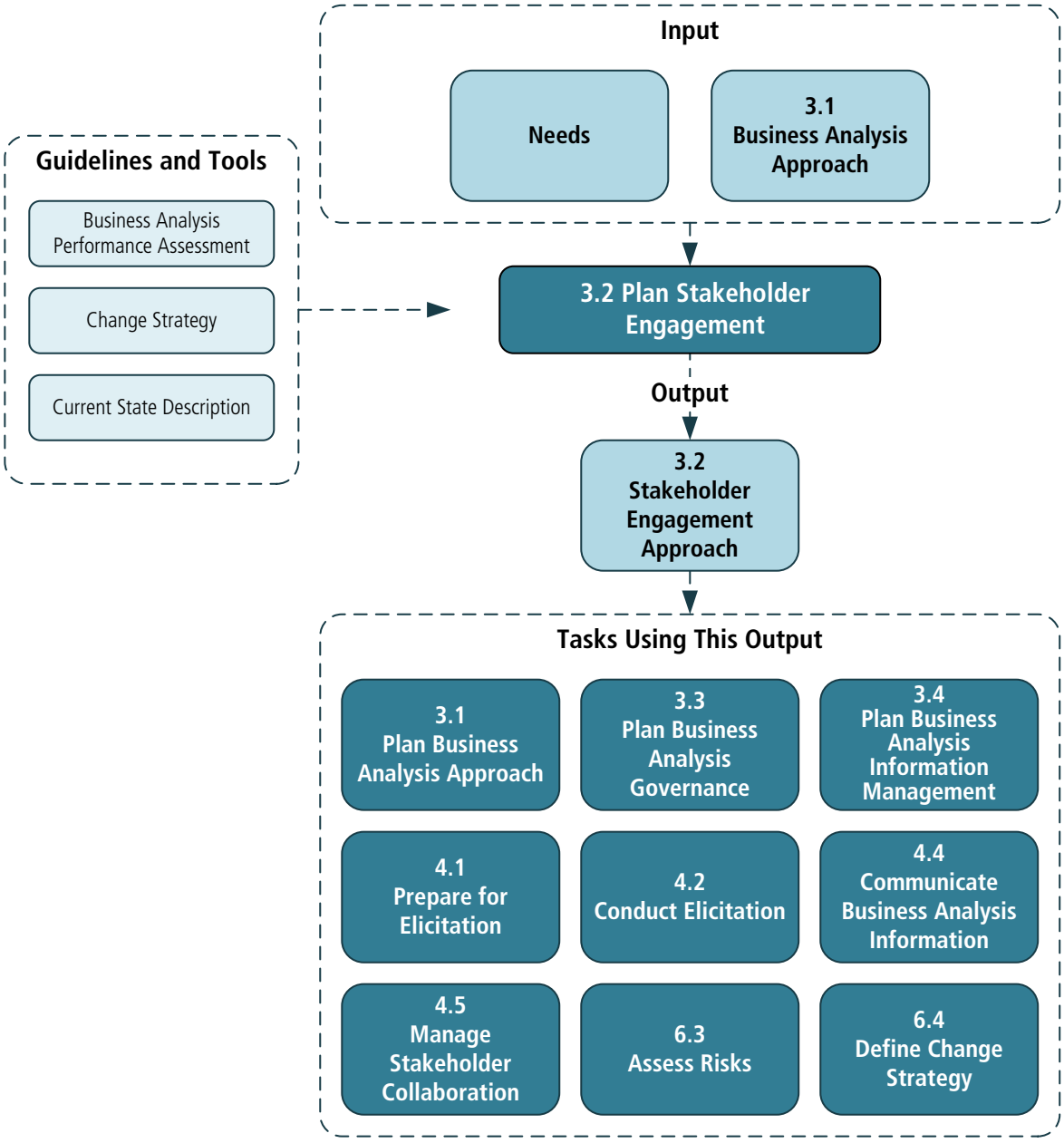
Figure 3.2.1: Plan Stakeholder Engagement Input/Output Diagram



3.2.4 Elements

.1 Perform Stakeholder Analysis

Stakeholder analysis involves identifying the stakeholders (who will be directly or indirectly impacted by the change) and their characteristics, as well as analyzing the information once collected. Stakeholder analysis is performed repeatedly as business analysis activities continue.

A thorough and detailed stakeholder list ensures that stakeholders are not overlooked. Understanding who the stakeholders are, the impact of proposed changes on them, and the influence they may have on the change is vital to understanding what needs, wants, and expectations must be satisfied by a

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solution. If stakeholders are not identified, the business analyst may miss uncovering critical needs. Stakeholder needs uncovered late will often require a revision to business analysis tasks that are either in progress or are completed. This can result in increased costs and decreased stakeholder satisfaction.

How business analysts perform stakeholder analysis can vary between projects, methodologies, and organizations. A company's organizational chart and business processes can serve as an initial source for identifying internal stakeholders. The sponsor may also identify stakeholders. Stakeholders outside the organization may be identified and can be uncovered by understanding any existing contracts that may be in place, anticipated vendors that may have a role based on existing relationships with the organization, as well as regulatory and governing bodies that may influence the work. Shareholders, customers, and suppliers are also considered when searching for external stakeholders.

Roles

Business analysts identify stakeholder roles in order to understand where and how the stakeholders will contribute to the initiative. It is important that the business analyst is aware of the various roles a stakeholder is responsible for within the organization.

Attitudes

Stakeholder attitudes can positively or negatively impact a change. Business analysts identify stakeholder attitudes in order to fully understand what may impact a stakeholder's actions and behaviours. Knowing how a stakeholder perceives the initiative allows an opportunity for the business analyst to specifically plan their collaboration and engagement with that stakeholder.

Business analysts analyze stakeholder attitudes about:

- business goals, objectives of the initiative, and any proposed solutions,
- business analysis in general,
- the level of interest in the change,
- the sponsor,
- team members and other stakeholders, and
- collaboration and a team-based approach.

Stakeholders with positive attitudes may be strong champions and great contributors. Other stakeholders may not see value in the work, may misunderstand the value being provided, or may be concerned about the effect the change will have on them. Stakeholders who are expected to serve in key roles and participate heavily in business analysis activities, but who view a change negatively, may require collaboration approaches that increase their cooperation.

Decision Making Authority

Business analysts identify the authority level a stakeholder possesses over business analysis activities, deliverables, and changes to business analysis work.

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Understanding authority levels upfront eliminates confusion during the business analysis effort and ensures the business analyst collaborates with the proper stakeholders when looking for a decision to be made or seeking approvals.

Level of Power or Influence

Understanding the nature of influence and the influence structures and channels within an organization can prove invaluable when seeking to build relationships and trust. Understanding the influence and attitude each stakeholder may have can help develop strategies for obtaining buy-in and collaboration. Business analysts evaluate how much influence is needed to implement a change compared to the amount of influence the key stakeholders can bring. If there is a mismatch between the influence required and the amount of influence the stakeholder has or is perceived to have, business analysts develop risk plans, responses and other strategies that might be needed to obtain the required level of support.

.2 Define Stakeholder Collaboration

Ensuring effective collaboration with stakeholders is essential for maintaining their engagement in business analysis activities. Collaboration can be a spontaneous event. However, much collaboration is deliberate and planned, with specific activities and outcomes determined ahead of time during planning activities.

The business analyst may plan different collaboration approaches for internal and external stakeholders, and approaches may differ by business analysis activity. The objective is to select the approaches that work best to meet the needs of each stakeholder group and ensure their interest and involvement is maintained across the initiative. Some considerations when planning collaboration include:

- timing and frequency of collaboration,
- location,
- available tools such as wikis and online communities,
- delivery method such as in-person or virtual, and
- preferences of the stakeholders.

Planning considerations can be documented in the form of a stakeholder collaboration plan. As factors change, plans can be revisited, and adjustments and adaptations can be made to ensure ongoing engagement of stakeholders.

.3 Stakeholder Communication Needs

The business analyst evaluates:

- what needs to be communicated,
- what is the appropriate delivery method (written or verbal),
- who the appropriate audience is,
- when communication should occur,
- frequency of communication,

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- geographic location of stakeholders who will receive communications,
- level of detail appropriate for the communication and stakeholder, and
- level of formality of communications.

Communication considerations can be documented in the form of a stakeholder communication plan. Business analysts build and review communication plans with stakeholders to ensure their communication requirements and expectations are met.

3.2.5 Guidelines and Tools

- **Business Analysis Performance Assessment**: provides results of previous assessments that should be reviewed and incorporated.
- **Change Strategy**: used for improved assessment of stakeholder impact and the development of more effective stakeholder engagement strategies.
- **Current State Description**: provides the context within which the work needs to be completed. This information will lead to more effective stakeholder analysis and better understanding of the impact of the desired change.

3.2.6 Techniques

- **Brainstorming**: used to produce the stakeholder list and identify stakeholder roles and responsibilities.
- **Business Rules Analysis**: used to identify stakeholders who were the source of the business rules.
- **Document Analysis**: used to review existing organizational assets that might assist in planning stakeholder engagement.
- **Interviews**: used to interact with specific stakeholders to gain more information or knowledge about stakeholder groups.
- **Lessons Learned**: used to identify an enterprise's previous experience (both successes and challenges) with planning stakeholder engagement.
- **Mind Mapping**: used to identify potential stakeholders and help understand the relationships between them.
- **Organizational Modelling**: used to determine if the organizational units or people listed have any unique needs and interests that should be considered. Organizational models describe the roles and functions in the organization and the ways in which stakeholders interact which can help to identify stakeholders who will be affected by a change.
- **Process Modelling**: used to categorize stakeholders by the systems that support their business processes.
- **Risk Analysis and Management**: used to identify risks to the initiative resulting from stakeholder attitudes or the inability of key stakeholders to participate in the initiative.

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- **Scope Modelling**: used to develop scope models to show stakeholders that fall outside the scope of the solution but still interact with it in some way.
- **Stakeholder List, Map, or Personas**: used to depict the relationship of stakeholders to the solution and to one another.
- **Survey or Questionnaire**: used to identify shared characteristics of a stakeholder group.
- **Workshops**: used to interact with groups of stakeholders to gain more information about stakeholder groups.

3.2.7 Stakeholders

- **Customers**: a source of external stakeholders.
- **Domain Subject Matter Expert**: may help to identify stakeholders and may themselves be identified to fulfill one or more roles on the initiative.
- **End User**: a source of internal stakeholders.
- **Project Manager**: may be able to identify and recommend stakeholders. Responsibility for stakeholder identification and management may be shared with the business analyst.
- **Regulator**: may require that specific stakeholder representatives or groups be involved in the business analysis activities.
- **Sponsor**: may request that specific stakeholders be involved in the business analysis activities.
- **Supplier**: a source of external stakeholders.

3.2.8 Outputs

- **Stakeholder Engagement Approach**: contains a list of the stakeholders, their characteristics which were analyzed, and a listing of roles and responsibilities for the change. It also identifies the collaboration and communication approaches the business analyst will utilize during the initiative.

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3.3 Plan Business Analysis Governance

3.3.1 Purpose

The purpose of Plan Business Analysis Governance is to define how decisions are made about requirements and designs, including reviews, change control, approvals, and prioritization.

3.3.2 Description

Business analysts ensure that a governance process is in place and clarify any ambiguities within it. A governance process identifies the decision makers, process, and information required for decisions to be made. A governance process describes how approvals and prioritization decisions are made for requirements and designs.

When planning the governance approach, business analysts identify:

- how business analysis work will be approached and prioritized,
- what the process for proposing a change to business analysis information is,
- who has the authority and responsibility to propose changes and who should be involved in the change discussions,
- who has responsibility for analyzing change requests,
- who has the authority to approve changes, and
- how changes will be documented and communicated.

3.3.3 Inputs

- **Business Analysis Approach**: incorporating the overall business analysis approach into the governance approach is necessary to ensure consistency across the approaches.
- **Stakeholder Engagement Approach**: identifying stakeholders and understanding their communication and collaboration needs is useful in determining their participation in the governance approach. The engagement approach may be updated based on the completion of the governance approach.

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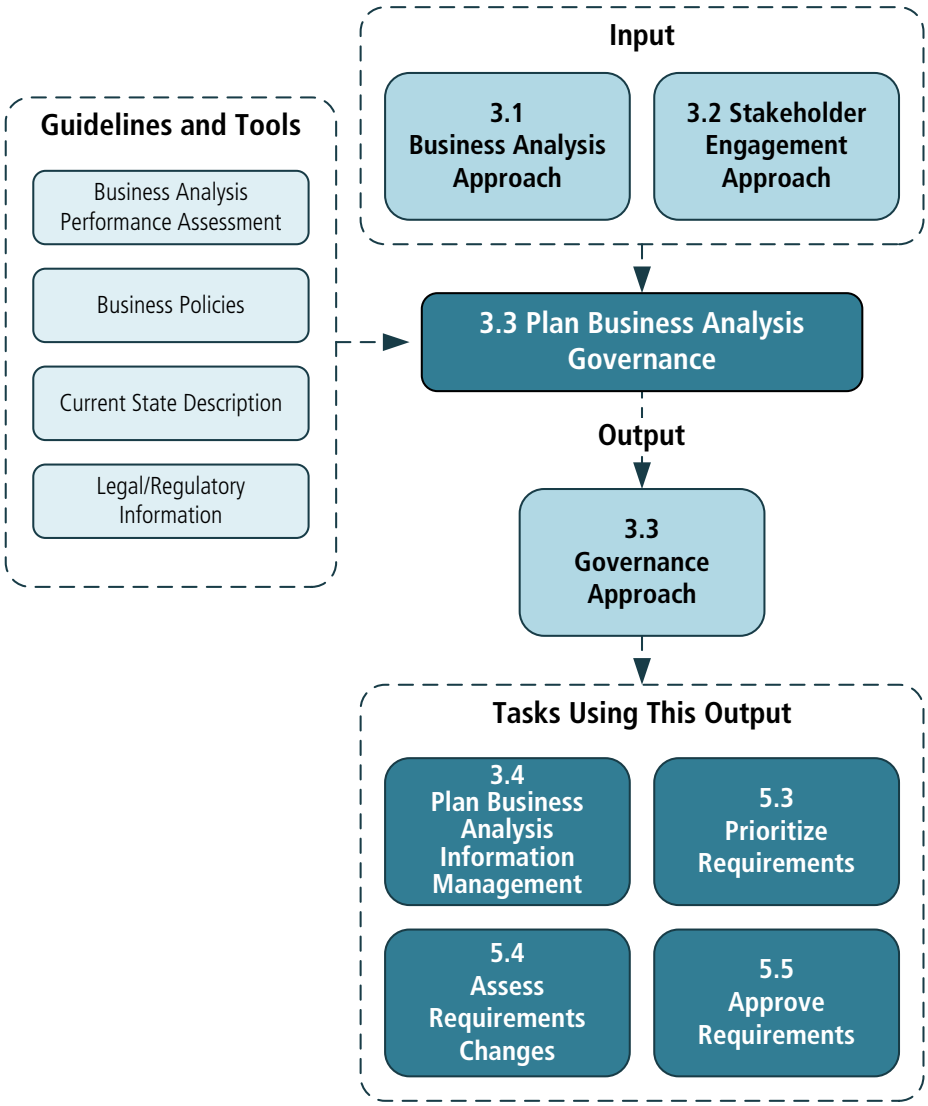
Figure 3.3.1: Plan Business Analysis Governance Input/Output Diagram



3.3.4 Elements

.1 Decision Making

Decisions are made throughout the initiative. A stakeholder may serve in various roles in the decision-making process such as:

- participant in decision-making discussions,
- subject matter expert (SME) lending experience and knowledge to the decision-making process,
- reviewer of information, and
- approver of decisions.

The decision-making process defines what happens when teams cannot reach consensus, by identifying escalation paths and key stakeholders who hold final decision-making authority.

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.2 Change Control Process

When business analysts develop a change control process, they:

- **Determine the process for requesting changes**: specify which requirements and designs the change control process covers and determine whether it applies to all changes or only to changes of a specific size, cost, or level of effort. This process details the steps for proposing a change, when changes can be proposed, who can propose changes and how change requests are communicated.
- **Determine the elements of the change request**: identify the information to be included in a proposal to support decision making and implementation if it is approved.
  Possible components to consider on a change request are:
  - **Cost and time estimates**: for each area affected by the proposed change, the expected cost of change is estimated.
  - **Benefits**: an explanation of how the change aligns with the initiative and business objectives to show how the change adds value. Benefits considered include both financial benefits and tactical benefits such as implications to scope, time, cost, quality, and resources.
  - **Risks**: an analysis of risks to the initiative, the solution, or business objectives.
  - **Priority**: the level of importance of the change relative to other factors such as organizational objectives, regulatory compliance requirements, and stakeholder needs.
  - **Course(s) of action**: the course of action for the change includes an assessment of the components of the change request (cost, time, benefits, risks and priority). It is common to identify several alternative courses, including those recommended by the requester and by other stakeholders so decision makers can make a choice that will best serve the needs of the initiative.
- **Determine how changes will be prioritized**: the priority of the proposed change is established relative to other competing interests within the current initiative.
- **Determine how changes will be documented**: configuration management and traceability standards establish product baselines and version control practices that identify which baseline is affected by the change.
- **Determine how changes will be communicated**: how proposed changes, changes under review, and approved, declined, or deferred changes will be communicated to stakeholders.
- **Determine who will perform the impact analysis**: specify who is responsible for performing an analysis of the impacts the proposed change will have across the initiative.

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- **Determine who will authorize changes**: include a designation of who can approve changes and what business analysis information their authority covers.

.3 Plan Prioritization Approach

Timelines, expected value, dependencies, resource constraints, adopted methodologies, and other factors influence how requirements and designs are prioritized.

When planning the prioritization process, business analysts determine the:

- formality and rigour of the prioritization process,
- participants who will be involved in prioritization,
- process for deciding how prioritization will occur, including which prioritization techniques will be utilized, and
- criteria to be used for prioritization. For example, requirements may be prioritized based on cost, risk, and value.

The approach should also determine which stakeholders will have a role in prioritization.

.4 Plan for Approvals

An approval formalizes the agreement between all stakeholders that the content and presentation of the requirements and designs are accurate, adequate, and contain sufficient detail to allow for continued progress to be made.

The timing and frequency of approvals are dependent on the size and complexity of the change and associated risks of foregoing or delaying an approval.

The business analyst must determine the type of requirements and designs to be approved, the timing for the approvals, the process to follow to gain approval, and who will approve the requirements and designs.

When planning the appropriate approval process, business analysts consider the organizational culture and the type of information being approved. For example, new systems or processes for highly regulated industries such as financial, pharmaceutical, or healthcare are likely to require frequent and rigorous review and approval of very detailed specifications. For other types of initiatives, a less intensive approval process may be more appropriate and result in a faster implementation.

Planning for approvals also includes the schedule of events where approvals will occur and how they will be tracked. Stakeholder availability, attitude, and willingness to engage determine the efficiency of the approval process and may significantly affect delivery timelines.

3.3.5 Guidelines and Tools

- **Business Analysis Performance Assessment**: provides results of previous assessments that should be reviewed and incorporated into all planning approaches.

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- **Business Policies**: define the limits within which decisions must be made. They may be described by regulations, contracts, agreements, warranties, certifications or other legal obligations.
- **Current State Description**: provides the context within which the work needs to be completed. This information can help drive how to make better decisions.
- **Legal/Regulatory Information**: describes legislative rules or regulations that must be followed, and can be used to help develop a framework that ensures sound business decision making.

3.3.6 Techniques

- **Brainstorming**: used to generate an initial list of potential stakeholder names who may need approval roles in the defined governance process.
- **Document Analysis**: used to evaluate existing governance processes or templates.
- **Interviews**: used to identify possible decision-making, change control, approval, or prioritization approaches and participants with an individual or small group.
- **Item Tracking**: used to track any issues that arise when planning a governance approach.
- **Lessons Learned**: used to find if past initiatives have identified valuable experiences with governance that can be leveraged on current or future initiatives.
- **Organizational Modelling**: used to understand roles/responsibilities within the organization in an effort to define a governance approach that involves the right stakeholders.
- **Process Modelling**: used to document the process or method for governing business analysis.
- **Reviews**: used to review the proposed governance plan with key stakeholders.
- **Survey or Questionnaire**: used to identify possible decision-making, change control, approval, or prioritization approaches and participants.
- **Workshops**: used to identify possible decision-making, change control, approval, or prioritization approaches and participants within a team setting.

3.3.7 Stakeholders

- **Domain Subject Matter Expert**: may be a possible source of a requested change or may be identified as needing to be involved in change discussions.
- **Project Manager**: works with the business analyst to ensure that overall project governance aligns with the business analysis governance approach.
- **Regulator**: may impose rules or regulations that need to be considered when determining the business analysis governance plan. May also be a possible source of a requested change.

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- **Sponsor**: can impose their own requirements for how business analysis information should be managed. Participates in change discussions and approves proposed changes.

3.3.8 Outputs

- **Governance Approach**: identifies the stakeholders who will have the responsibility and authority to make decisions about business analysis work including who will be responsible for setting priorities and who will approve changes to business analysis information. It also defines the process that will be utilized to manage requirement and design changes across the initiative.

3.4 Plan Business Analysis Information Management

3.4.1 Purpose

The purpose of Plan Business Analysis Information Management is to develop an approach for how business analysis information will be stored and accessed.

3.4.2 Description

Business analysis information is comprised of all the information business analysts elicit, create, compile, and disseminate in the course of performing business analysis. Models, scope statements, stakeholder concerns, elicitation results, requirements, designs, and solution options are just a few examples. This includes requirements and designs, from lightweight user stories to formal requirement documents to functioning prototypes.

Information management entails identifying:

- how information should be organized,
- the level of detail at which information should be captured,
- any relationships between the information,
- how information may be used across multiple initiatives and throughout the enterprise,
- how information should be accessed and stored, and
- characteristics about the information that must be maintained.

Information management helps ensure that business analysis information is organized in a functional and useful manner, is easily accessible to appropriate personnel, and is stored for the necessary length of time.

3.4.3 Inputs

- **Business Analysis Approach**: incorporating the overall business analysis approach into the information management approach is necessary to ensure consistency across the approaches.

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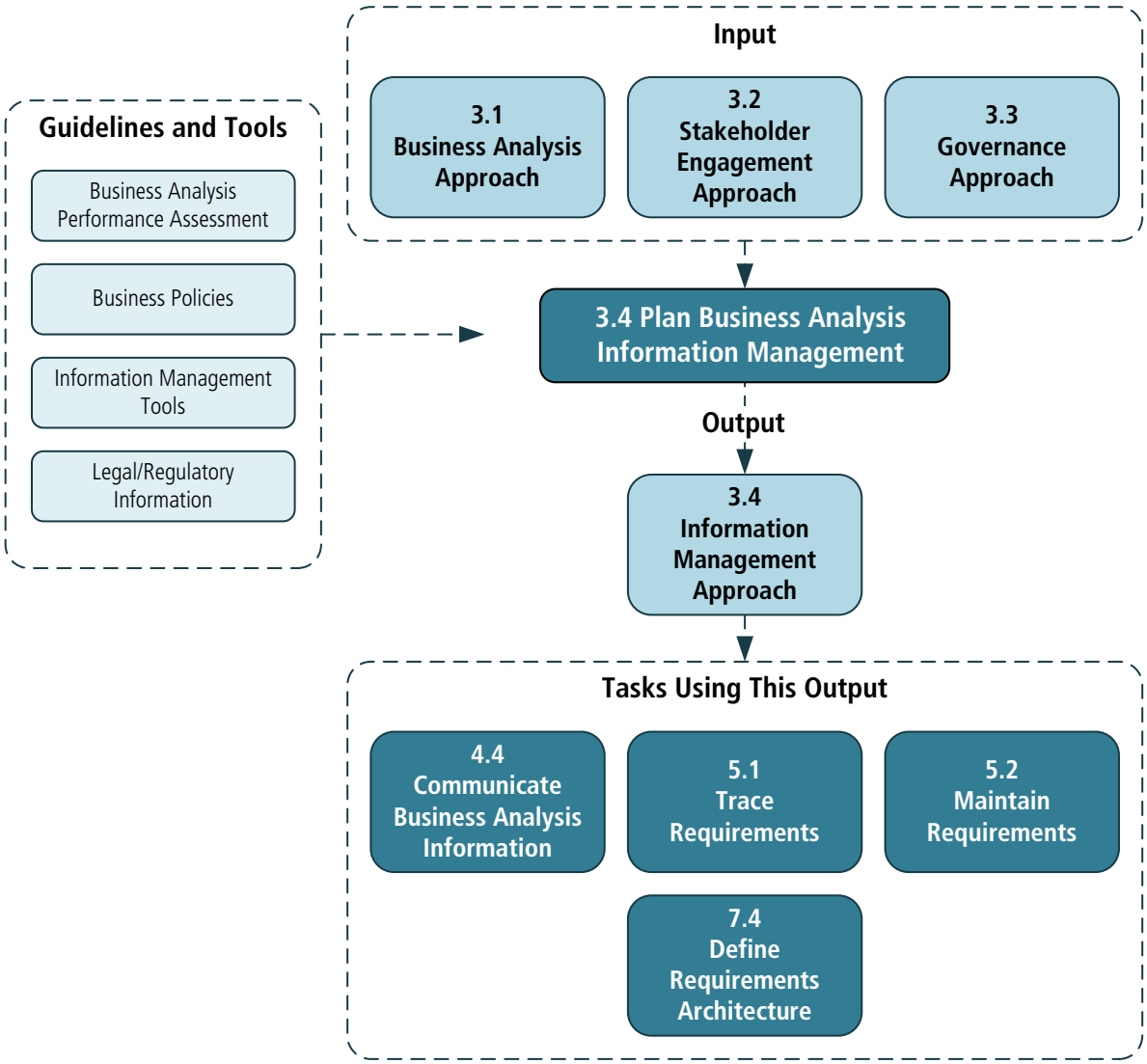
- **Governance Approach**: defines how business analysts manage changes to requirements and designs, how decisions and approvals for business analysis deliverables will be made, and how priorities will be set.
- **Stakeholder Engagement Approach**: identifying stakeholders and understanding their communication and collaboration needs is useful in determining their specific information management needs.

Figure 3.4.1: Plan Business Analysis Information Management Input/Output Diagram



3.4.4 Elements

.1 Organization of Business Analysis Information

Business analysts are responsible for organizing business analysis information in a manner that allows for efficient access and use. Information must be well structured to ensure it is not difficult to locate, conflicts with other information, or is needlessly duplicated.

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The business analyst determines how best to structure and organize the business analysis information at the start of an initiative. This involves taking into consideration the type and amount of information to be collected, the stakeholder's access and usage needs, and the size and complexity of the change. Relationships among the types of information must be defined to assist in managing the effect of new or changed information in the future.

.2 Level of Abstraction

Level of abstraction describes the breadth and depth of the information being provided. Representations of information may range from highly conceptual or summarized to very detailed. In determining how much detail each stakeholder may require as the initiative evolves, consideration is given to the needs of the stakeholders, the complexity of what is being explained, and the importance of the change. Rather than present the same information to all stakeholders, business analysts should present information with appropriate breadth and level of detail based on each stakeholder's role. Business analysis information regarding a topic of significant importance or high level of risk is frequently represented in greater detail.

.3 Plan Traceability Approach

The traceability approach is based on:

- the complexity of the domain,
- the number of views of requirements that will be produced,
- any requirement-related risks, organizational standards, applicable regulatory requirements, and
- an understanding of the costs and benefits involved with tracing.

Business analysts plan to ensure the approach is at a level of detail to add value without excessive overhead.

.4 Plan for Requirements Reuse

Reusing requirements can save an organization time, effort, and cost—provided the requirements are accessible and structured in a manner that supports their reuse.

Requirements that are potential candidates for long-term use are those an organization must meet on an ongoing basis such as:

- regulatory requirements,
- contractual obligations,
- quality standards,
- service level agreements,
- business rules,
- business processes, or
- requirements describing products the enterprise produces.

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Requirements may also be reused when describing common features or services that are used across multiple systems, processes, or programs.

To make requirements useful beyond the current change, business analysts plan ahead for requirements reuse by identifying how best to structure, store, and access requirements so they are usable and accessible for future business analysis efforts.

In order for requirements to be reused they must be clearly named, defined, and stored in a repository that is available to other business analysts.

.5 Storage and Access

Business analysis information can be stored in many ways. Storage decisions depend on many factors such as who must access the information, how often they need to access it, and what conditions must be present for access. Organizational standards and tool availability also influence storage and access decisions. The business analysis approach defines how various tools will be used on the initiative and how the information will be captured and stored within those tools. Tools may shape the selection of business analysis techniques, notations to be used, and the way that information is organized.

The repository may need to store information other than requirements and designs. It should be able to indicate the status of any stored information, and allow for modification of that information over time.

.6 Requirements Attributes

Requirements attributes provide information about requirements, and aid in the ongoing management of the requirements throughout the change. They are planned for and determined with the requirements themselves.

Requirements attributes allow business analysts to associate information with individual or related groups of requirements. The information documented by the attributes helps the team efficiently and effectively make trade-offs between requirements, identify stakeholders affected by potential changes, and understand the effect of a proposed change.

Some commonly used requirements attributes include:

- **Absolute reference**: provides a unique identifier. The reference is not altered or reused if the requirement is moved, changed, or deleted.
- **Author**: provides the name of the person who needs to be consulted should the requirement later be found to be ambiguous, unclear, or in conflict.
- **Complexity**: indicates how difficult the requirement will be to implement.
- **Ownership**: indicates the individual or group that needs the requirement or will be the business owner after the solution is implemented.
- **Priority**: indicates relative importance of requirements. Priority can refer to the relative value of a requirement or to the sequence in which it will be implemented.

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- **Risks**: identifies uncertain events that may impact requirements.
- **Source**: identifies the origin of the requirement. The source is often consulted if the requirement changes or if more information regarding the requirement or the need that drove the requirement has to be obtained.
- **Stability**: indicates the maturity of the requirement.
- **Status**: indicates the state of the requirement, whether it is proposed, accepted, verified, postponed, cancelled, or implemented.
- **Urgency**: indicates how soon the requirement is needed. It is usually only necessary to specify this separately from the priority when a deadline exists for implementation.

3.4.5 Guidelines and Tools

- **Business Analysis Performance Assessment**: provides results of previous assessments that should be reviewed and incorporated into all planning approaches.
- **Business Policies**: define the limits within which decisions must be made. They may be described by regulations, contracts, agreements, warranties, certifications, or other legal obligations.
- **Information Management Tools**: each organization uses some tools to store, retrieve, and share business analysis information. These may be as simple as a whiteboard, or as complex as a global wiki or robust requirements management tool.
- **Legal/Regulatory Information**: describes legislative rules or regulations that must be followed, and helps determine how business analysis information will be managed.

3.4.6 Techniques

- **Brainstorming**: used to help stakeholders uncover their business analysis information management needs.
- **Interviews**: used to help specific stakeholders uncover their business analysis information management needs.
- **Item Tracking**: used to track issues with current information management processes.
- **Lessons Learned**: used to create a source of information for analyzing approaches for efficiently managing business analysis information.
- **Mind Mapping**: used to identify and categorize the kinds of information that need to be managed.
- **Process Modelling**: used to document the process or method for managing business analysis information.

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- **Survey or Questionnaire**: used to ask stakeholders to provide input into defining business analysis information management.
- **Workshops**: used to uncover business analysis information management needs in a group setting.

3.4.7 Stakeholders

- **Domain Subject Matter Expert**: may need to access and work with business analysis information, and will be interested in a more specific view of business analysis information which relates to their area of expertise.
- **Regulator**: may define rules and processes related to information management.
- **Sponsor**: reviews, comments on, and approves business analysis information.

3.4.8 Outputs

- **Information Management Approach**: includes the defined approach for how business analysis information will be stored, accessed, and utilized during the change and after the change is complete.

3.5 Identify Business Analysis Performance Improvements

3.5.1 Purpose

The purpose of Identify Business Analysis Performance Improvements is to assess business analysis work and to plan to improve processes where required.

3.5.2 Description

To monitor and improve performance, it is necessary to establish the performance measures, conduct the performance analysis, report on the results of the analysis, and identify any necessary preventive, corrective, or developmental actions. Performance analysis should occur throughout an initiative. Once potential performance improvements are identified, they become guidelines for the next time a task is executed.

3.5.3 Inputs

- **Business Analysis Approach**: identifies business analysis deliverables that will be produced, activities that will need to be performed (including when they will be performed and who will be performing them), and techniques that will be used.
- **Performance Objectives (external)**: describe the desired performance outcomes that an enterprise or organization is hoping to achieve.

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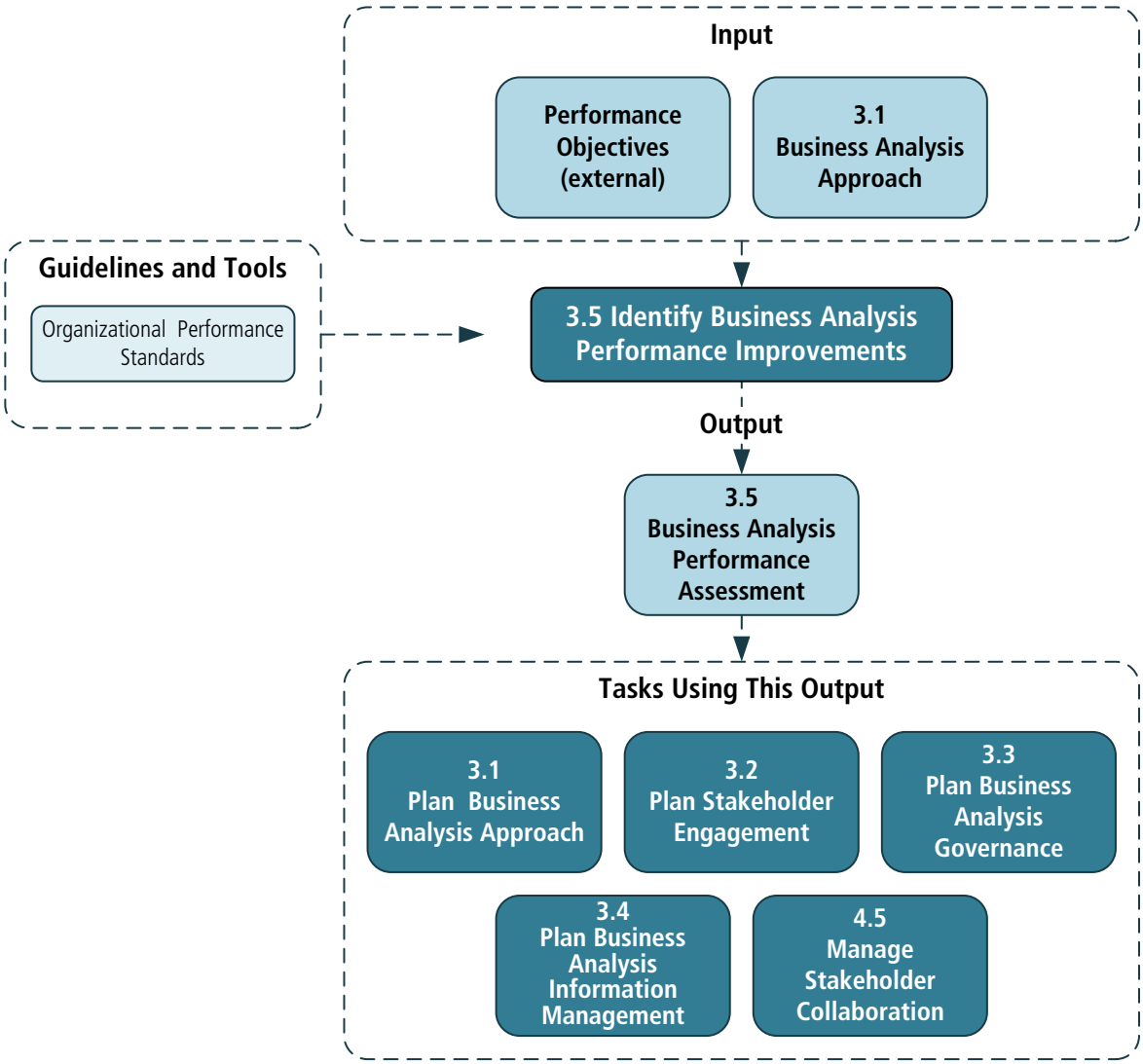
Figure 3.5.1: Identify Business Analysis Performance Improvements Input/Output Diagram



3.5.4 Elements

.1 Performance Analysis

What constitutes effective business analysis work depends on the context of a particular organization or initiative. Reports on business analysis performance can be informal and verbal, or they may include formal documentation. Reports on business analysis performance are designed and tailored to meet the needs of the various types of reviewers.

.2 Assessment Measures

If current measures exist, the business analyst may leverage them or determine new measures. The business analyst may also elicit assessment measures from stakeholders.

Performance measures may be based on deliverable due dates as specified in the

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business analysis plan, metrics such as the frequency of the changes to business analysis work products, the number of review cycles required, task efficiency, or qualitative feedback from stakeholders and peers regarding the business analyst's deliverables. Appropriate performance measures enable the business analyst to determine when problems are occurring that may affect the performance of business analysis or identify opportunities for improvement. Measures may be both quantitative and qualitative. Qualitative measures are subjective and can be heavily influenced by the stakeholder's attitudes, perceptions, and other subjective criteria.

All performance metrics will encourage certain behaviours and discourage others. Poorly chosen metrics may drive behaviour that is detrimental to the enterprise as a whole.

Some possible measures are:

- **Accuracy and Completeness**: determine whether the business analyst work products were correct and relevant when delivered, or whether ongoing revisions were needed to gain acceptance by stakeholders.
- **Knowledge**: assess whether the business analyst had the skills and/or experience to perform the assigned task.
- **Effectiveness**: assess whether the business analyst work products were easy to use as standalone deliverables or whether they required extensive explanation in order to be understood.
- **Organizational Support**: assess whether there were adequate resources available to complete business analysis activities as needed.
- **Significance**: consider the benefit obtained from the work products and assess whether the cost, time, and resource investments expended to produce the work products were justified for the value they delivered.
- **Strategic**: look at whether business objectives were met, problems were solved, and improvements were achieved.
- **Timeliness**: evaluate whether the business analyst delivered the work on time per stakeholder expectations and schedule.

.3 Analyze Results

The business analysis process and deliverables are compared against the set of defined measures. The analysis may be performed on the business analysis process, the resources involved, and the deliverables.

Performance may be determined from the point of view of the stakeholders who are the recipients of the business analysis work. Other times a personnel manager or a Centre of Excellence may make this determination and provide assessments. All stakeholders may have input in assessing the value of the business analysis work but organizations may differ in terms of who has the authority to set the targets against which performance is measured.

.4 Recommend Actions for Improvement

Once the analysis of performance results is complete, the business analyst engages the appropriate stakeholders to identify the following actions:

- **Preventive**: reduces the probability of an event with a negative impact.

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- **Corrective**: establishes ways to reduce the negative impact of an event.
- **Improvement**: establishes ways to increase the probability or impact of events with a positive impact.

These actions are likely to result in changes to the business analysis approach, repeatable processes, and tools.

3.5.5 Guidelines and Tools

- **Organizational Performance Standards**: may include performance metrics or expectations for business analysis work mandated by the organization.

3.5.6 Techniques

- **Brainstorming**: used to generate ideas for improvement opportunities.
- **Interviews**: used to gather assessments of business analysis performance.
- **Item Tracking**: used to track issues that occur during the performance of business analysis for later resolution.
- **Lessons Learned**: used to identify recommended changes to business analysis processes, deliverables, templates, and other organizational process assets that can be incorporated into the current initiative and future work.
- **Metrics and Key Performance Indicators (KPIs)**: used to determine what metrics are appropriate for assessing business analysis performance and how they may be tracked.
- **Observation**: used to witness business analysis performance.
- **Process Analysis**: used to analyze existing business analysis processes and identify opportunities for improvement.
- **Process Modelling**: used to define business analysis processes and understand how to improve those processes to reduce problems from hand-offs, improve cycle times, or alter how business analysis work is performed to support improvements in downstream processes.
- **Reviews**: used to identify changes to business analysis processes and deliverables that can be incorporated into future work.
- **Risk Analysis and Management**: used to identify and manage potential conditions or events that may impact business analysis performance.
- **Root Cause Analysis**: used to help identify the underlying cause of failures or difficulties in accomplishing business analysis work.
- **Survey or Questionnaire**: used to gather feedback from stakeholders about their satisfaction with business analysis activities and deliverables.
- **Workshops**: used to gather assessments of business analysis performance and generate ideas for improvement opportunities.

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3.5.7 Stakeholders

- **Domain Subject Matter Experts**: should be informed about the business analysis activities in order to set expectations regarding their involvement in the work and to elicit their feedback regarding possible improvements to the approach.
- **Project Manager**: is accountable for the success of a project and must be kept informed of the current status of business analysis work. If potential problems or opportunities for improvement are identified, the project manager must be consulted before changes are implemented to assess whether those changes will have an impact on the project. They may also deliver reports on business analysis performance to the sponsor and other stakeholders.
- **Sponsor**: may require reports on business analysis performance to address problems as they are identified. A manager of business analysts may also sponsor initiatives to improve the performance of business analysis activities.

3.5.8 Outputs

- **Business Analysis Performance Assessment**: includes a comparison of planned versus actual performance, identifying the root cause of variances from the expected performance, proposed approaches to address issues, and other findings to help understand the performance of business analysis processes.

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4 Elicitation and Collaboration

The Elicitation and Collaboration knowledge area describes the tasks that business analysts perform to obtain information from stakeholders and confirm the results. It also describes the communication with stakeholders once the business analysis information is assembled.

Elicitation is the drawing forth or receiving of information from stakeholders or other sources. It is the main path to discovering requirements and design information, and might involve talking with stakeholders directly, researching topics, experimenting, or simply being handed information. Collaboration is the act of two or more people working together towards a common goal. The Elicitation and Collaboration knowledge area describes how business analysts identify and reach agreement on the mutual understanding of all types of business analysis information. Elicitation and collaboration work is never a 'phase' in business analysis; rather, it is ongoing as long as business analysis work is occurring.

Elicitation and collaboration can be planned, unplanned, or both. Planned activities such as workshops, experiments, and/or surveys can be structured and organized in advance. Unplanned activities happen in the moment without notice, such as last-minute or 'just in time' collaboration or conversations. Business analysis information derived from an unplanned activity may require deeper exploration through a planned activity.

Eliciting business analysis information is not an isolated activity. Information is elicited while performing any task that includes interaction with stakeholders and while the business analyst is performing independent analytical work. Elicitation may trigger additional elicitation for details to fill in gaps or increase understanding.

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The Elicitation and Collaboration knowledge area is composed of the following tasks:

- **Prepare for Elicitation**: involves ensuring that the stakeholders have the information they need to provide and that they understand the nature of the activities they are going to perform. It also sets a shared set of expectations regarding the outcomes of the activity. Preparation may also involve identifying research sources or preparing to conduct an experiment to see if a process change actually results in an improvement.
- **Conduct Elicitation**: describes the work performed to understand stakeholder needs and identify potential solutions that may meet those needs. This may involve direct interaction with stakeholders, doing research, or running experiments.
- **Confirm Elicitation Results**: involves ensuring that stakeholders have a shared understanding of the outcomes of elicitation, that elicited information is recorded appropriately, and that the business analyst has the information sought from an elicitation activity. This task also involves comparing the information received with other information to look for inconsistencies or gaps.
- **Communicate Business Analysis Information**: provides stakeholders with the information they need, at the time they need it. The information is presented in a useful form, using the right terminology and concepts.
- **Manage Stakeholder Collaboration**: describes working with stakeholders to engage them in the overall business analysis process and to ensure that the business analyst can deliver the outcomes needed.

The Core Concept Model in Elicitation and Collaboration

The *Business Analysis Core Concept Model*™ (*BACCM*™) describes the relationships among the six core concepts.

The following table describes the usage and application of each of the core concepts within the context of Elicitation and Collaboration.

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Table 4.0.1: The Core Concept Model in Elicitation and Collaboration

Core Concept	During Elicitation and Collaboration, business analysts...
Change: the act of transformation in response to a need.	use a variety of elicitation techniques to fully identify the characteristics of the change including concerns that stakeholders have about the change. The change itself may determine the appropriate types and extent of elicitation and collaboration.
Need: a problem or opportunity to be addressed.	elicit, confirm, and communicate needs and supporting business analysis information. As elicitation is iterative and incremental, the understanding of needs may evolve over time.
Solution: a specific way of satisfying one or more needs in a context.	elicit, confirm, and communicate necessary or desired characteristics of proposed solutions.
Stakeholder: a group or individual with a relationship to the change, the need, or the solution.	manage the collaboration with the stakeholders who participate in the business analysis work. All stakeholders may participate in different roles and at different times during a change.
Value: the worth, importance, or usefulness of something to a stakeholder within a context.	collaborate with stakeholders to assess the relative value of information provided through elicitation, and apply a variety of techniques to confirm and communicate that value.
Context: the circumstances that influence, are influenced by, and provide understanding of the change.	apply a variety of elicitation techniques to identify business analysis information about the context that may affect the change.

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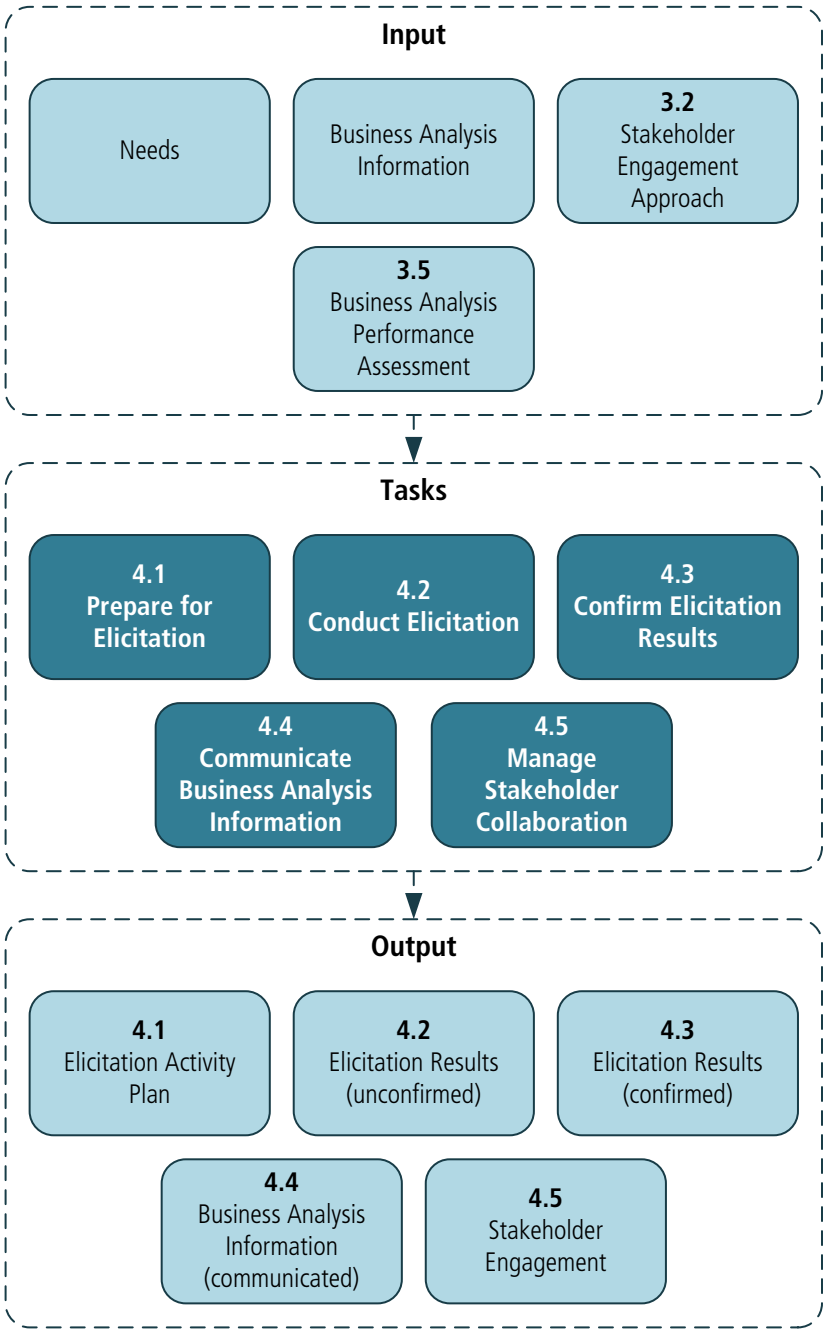
Figure 4.0.1: Elicitation and Collaboration Input/Output Diagram



4.1 Prepare for Elicitation

4.1.1 Purpose

The purpose of Prepare for Elicitation is to understand the scope of the elicitation activity, select appropriate techniques, and plan for (or procure) appropriate supporting materials and resources.

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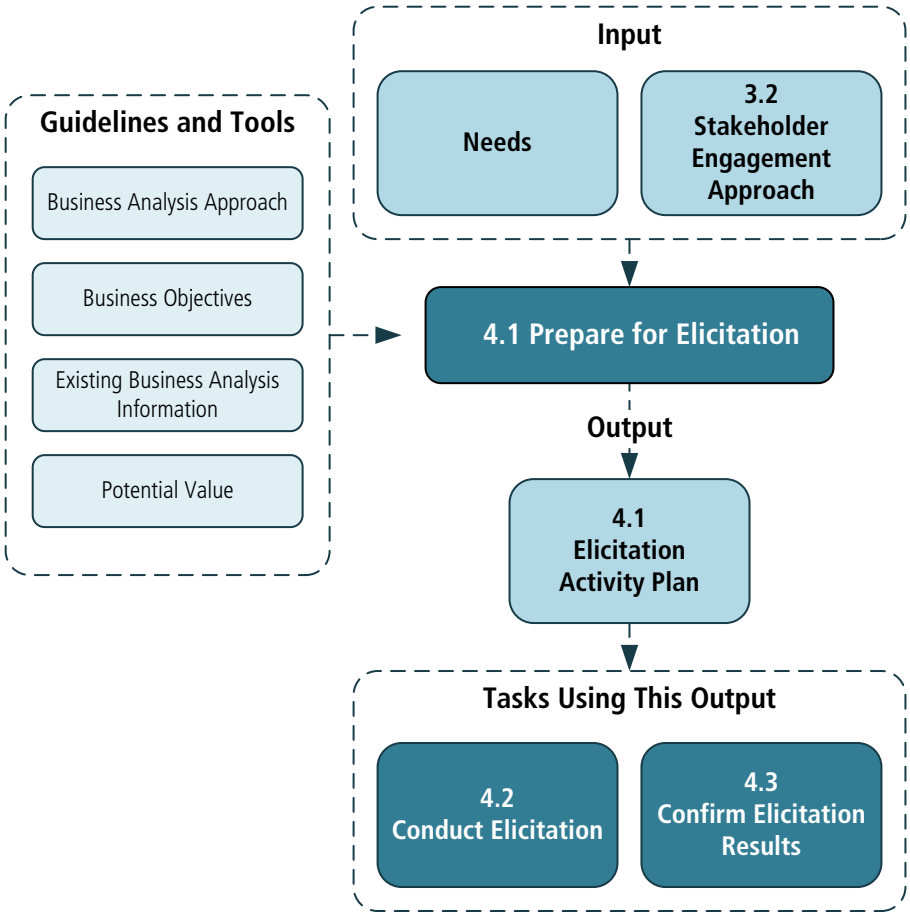
4.1.2 Description

Business analysts prepare for elicitation by defining the desired outcomes of the activity, considering the stakeholders involved and the goals of the initiative. This includes determining which work products will be produced using the elicitation results, deciding which techniques are best suited to produce those results, establishing the elicitation logistics, identifying any supporting materials needed, and understanding circumstances to foster collaboration during an elicitation activity.

4.1.3 Inputs

- **Needs**: guides the preparation in terms of the scope and purpose of elicitation activities. Elicitation can be used to discover the needs, but in order to get started there must be some need that exists—even if it has not yet been fully elicited or understood.
- **Stakeholder Engagement Approach**: understanding stakeholders' communication and collaboration needs helps plan and prepare appropriate and effective elicitation events.

Figure 4.1.1: Prepare for Elicitation Input/Output Diagram



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4.1.4 Elements

.1 Understand the Scope of Elicitation

To determine the type of business analysis information to be discovered during the elicitation activity and the techniques that may be used, business analysts consider:

- business domain,
- overall corporate culture and environment,
- stakeholder locations,
- stakeholders who are involved and their group dynamics,
- expected outputs the elicitation activities will feed,
- skills of the business analysis practitioner,
- other elicitation activities planned to complement this one,
- strategy or solution approach,
- scope of future solution, and
- possible sources of the business analysis information that might feed into the specific elicitation activity.

Understanding the scope of the elicitation activity allows business analysts to respond if the activity strays from the intended scope. It also allows them to recognize if people and materials are not available in time, and when the activity is complete.

.2 Select Elicitation Techniques

In most cases, multiple techniques are used during an elicitation activity. The techniques used depend on cost and time constraints, the types of business analysis information sources and their access, the culture of the organization, and the desired outcomes. The business analyst may also factor in the needs of the stakeholders, their availability, and their location (co-located or dispersed). Choosing the right techniques and ensuring each technique is performed correctly is extremely important to the success of the elicitation activity. When selecting elicitation techniques, business analysts consider:

- techniques commonly used in similar initiatives,
- techniques specifically suited to the situation, and
- the tasks needed to prepare, execute, and complete each technique.

Due to changing dynamics and situations, the business analyst may be required to adjust the initial selections by incorporating more appropriate techniques. A thorough understanding of the variety of techniques available assists the business analyst in adapting to changing circumstances.

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.3 Set Up Logistics

Logistics are planned prior to an elicitation activity. The logistics for each elicitation activity include identifying:

- the activity's goals,
- participants and their roles,
- scheduled resources, including people, rooms, and tools,
- locations,
- communication channels,
- techniques, and
- languages used by stakeholders (oral and written).

The logistics may also involve creating an agenda if other stakeholders are involved.

.4 Secure Supporting Material

Business analysts identify sources of information that are needed to conduct the elicitation activity. There might be a great deal of information needed to conduct elicitation including people, systems, historical data, materials and documents. Documents could include existing system documents, relevant business rules, organizational polices, regulations, and contracts. Supporting materials might also take the form of outputs of analysis work, such as draft versions of analysis models (see Specify and Model Requirements (p. 136)). Business analysts procure or develop the materials and tools needed. Additional planning for experimental elicitation might be required if novel tools, equipment, or techniques are going to be used.

.5 Prepare Stakeholders

Business analysts may need to educate stakeholders on how an elicitation technique works or what information is needed. It may be helpful to explain an elicitation technique to stakeholders not involved in the activity to help them understand the validity and relevance of the information elicited. Stakeholders may be unresponsive or challenging during an elicitation activity if they feel that it is not aligned to their individual objectives, don't understand the purpose, or are confused about the process. In preparing for elicitation, the business analyst should ensure that there is buy-in from all necessary stakeholders.

Business analysts may also prepare stakeholders by requesting that they review supporting materials prior to the elicitation activity in order to make it as effective as possible. An agenda might be provided in advance to support stakeholders in coming prepared to the activity with the necessary frame of mind and information.

Eliciting through research or exploration may be a solo activity for the business analyst and not require preparing other stakeholders.

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4.1.5 Guidelines and Tools

- **Business Analysis Approach**: sets the general strategy to be used to guide the business analysis work. This includes the general methodology, types of stakeholders and how they should be involved, list of stakeholders, timing of the work, expected format and level of detail of elicitation results, and identified challenges and uncertainties.
- **Business Objectives**: describe the desired direction needed to achieve the future state. They can be used to plan and prepare elicitation events, and to develop supporting materials.
- **Existing Business Analysis Information**: may provide a better understanding of the goals of the elicitation activity, and aid in preparing for elicitation.
- **Potential Value**: describes the value to be realized by implementing the proposed future state, and can be used to shape elicitation events.

4.1.6 Techniques

- **Brainstorming**: used to collaboratively identify and reach consensus about which sources of business analysis information should be consulted and which elicitation techniques might be most effective.
- **Data Mining**: used to identify information or patterns that require further investigation.
- **Document Analysis**: used to identify and assess candidate sources of supporting materials.
- **Estimation**: used to estimate the time and effort required for the elicitation and the associated cost.
- **Interviews**: used to identify concerns about the planned elicitation, and can be used to seek authority to proceed with specific options.
- **Mind Mapping**: used to collaboratively identify and reach consensus about which sources of business analysis information should be consulted and which elicitation techniques might be most effective.
- **Risk Analysis and Management**: used to identify, assess, and manage conditions or situations that could disrupt the elicitation, or affect the quality and validity of the elicitation results. The plans for the elicitation should be adjusted to avoid, transfer, or mitigate the most serious risks.
- **Stakeholder List, Map, or Personas**: used to determine who should be consulted while preparing for the elicitation, who should participate in the event, and the appropriate roles for each stakeholder.

4.1.7 Stakeholders

- **Domain Subject Matter Expert**: provides supporting materials as well as guidance about which other sources of business analysis information to consult. May also help to arrange research, experiments, and facilitated elicitation.

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- **Project Manager**: ensures that the appropriate people and resources are available to conduct the elicitation.
- **Sponsor**: has the authority to approve or deny a planned elicitation event, and to authorize and require the participation of specific stakeholders.

4.1.8 Outputs

- **Elicitation Activity Plan**: used for each elicitation activity. It includes logistics, scope of the elicitation activity, selected techniques, and supporting materials.

4.2 Conduct Elicitation

4.2.1 Purpose

The purpose of Conduct Elicitation is to draw out, explore, and identify information relevant to the change.

4.2.2 Description

There are three common types of elicitation:

- **Collaborative**: involves direct interaction with stakeholders, and relies on their experiences, expertise, and judgment.
- **Research**: involves systematically discovering and studying information from materials or sources that are not directly known by stakeholders involved in the change. Stakeholders might still participate in the research. Research can include data analysis of historical data to identify trends or past results.
- **Experiments**: involves identifying information that could not be known without some sort of controlled test. Some information cannot be drawn from people or documents—because it is unknown. Experiments can help discover this kind of information. Experiments include observational studies, proofs of concept, and prototypes.

One or more elicitation techniques may be used to produce the desired outcome within the scope of elicitation.

Stakeholders may collaborate in elicitation by:

- participating and interacting during the elicitation activity, and
- researching, studying, and providing feedback on documents, systems, models, and interfaces.

4.2.3 Inputs

- **Elicitation Activity Plan**: includes the planned elicitation activities and techniques, activity logistics (for example, date, time, location, resources,

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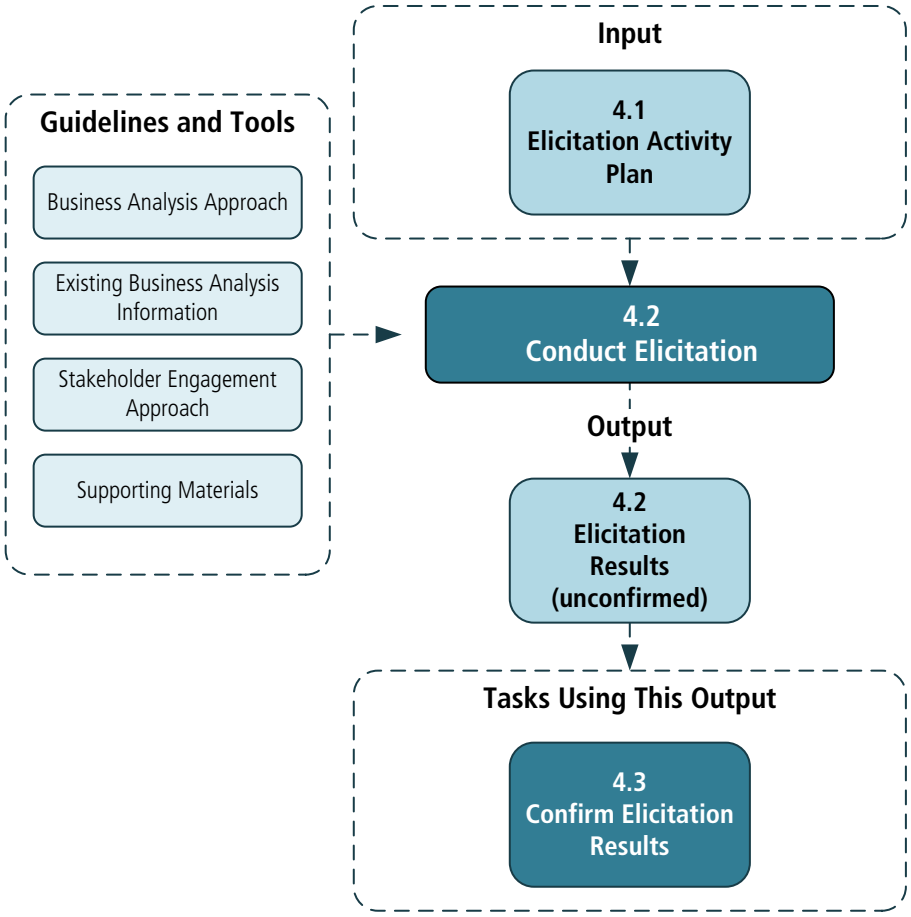
agenda), scope of the elicitation activity, and available sources of background information.

Figure 4.2.1: Conduct Elicitation Input/Output Diagram



4.2.4 Elements

.1 Guide Elicitation Activity

Understanding the proposed representations of business analysis information, which were defined in planning, helps ensure that the elicitation activities are focused on producing the intended information at the desired level of detail. This applies to each instance of an elicitation activity throughout a change and may vary based on the activity. In order to help guide and facilitate towards the expected outcomes, business analysts consider:

- the elicitation activity goals and agenda,
- scope of the change,
- what forms of output the activity will generate,
- what other representations the activity results will support,
- how the output integrates into what is already known,
- who provides the information,

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- who will use the information, and
- how the information will be used.

While most of these are considered when planning for the elicitation activity (see Prepare for Elicitation (p. 56)), they are also all important while performing the elicitation activity in order to keep it on track and achieve its goal. For example, stakeholders might have discussions that are out of scope for the activity or change, and the business analyst needs to recognize that in the moment to determine the next step; either acknowledge it and continue, or guide the conversation differently.

The business analyst also uses this information to determine when there has been sufficient elicitation, in order to stop the activity.

.2 Capture Elicitation Outcomes

Conducting elicitation is frequently iterative and takes place in a series of sessions—in parallel or in sequence—according to the scope of the elicitation activity (see Prepare for Elicitation (p. 56)). If the elicitation activity is unplanned, outcomes are captured and integrated into the appropriate planned outcomes.

Capturing the elicitation outcomes helps to ensure that the information produced during elicitation activities is recorded for later reference and use.

4.2.5 Guidelines and Tools

- **Business Analysis Approach**: influences how each elicitation activity is performed, as it identifies the types of outputs that will be needed based on the approach.
- **Existing Business Analysis Information**: may guide the questions posed during elicitation and the approach used to draw out information from various stakeholders.
- **Stakeholder Engagement Approach**: provides collaboration and communication approaches that might be effective during elicitation.
- **Supporting Materials**: includes any materials to prepare both the business analyst and participants before elicitation, as well as any information, tools, or equipment to be used during the elicitation.

4.2.6 Techniques

- **Benchmarking and Market Analysis**: used as a source of business analysis information by comparing a specific process, system, product, service, or structure with some external baseline, such as a similar organization or baseline provided by an industry association. Market analysis is used to determine what customers want and what competitors provide.
- **Brainstorming**: used to generate many ideas from a group of stakeholders in a short period, and to organize and prioritize those ideas.

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- **Business Rules Analysis**: used to identify the rules that govern decisions in an organization and that define, constrain, or enable organizational operations.
- **Collaborative Games**: used to develop a better understanding of a problem or to stimulate creative solutions.
- **Concept Modelling**: used to identify key terms and ideas of importance and define the relationships between them.
- **Data Mining**: used to identify relevant information and patterns.
- **Data Modelling**: used to understand entity relationships during elicitation.
- **Document Analysis**: used to review existing systems, contracts, business procedures and policies, standards, and regulations.
- **Focus Groups**: used to identify and understand ideas and attitudes from a group.
- **Interface Analysis**: used to understand the interaction, and characteristics of that interaction, between two entities, such as two systems, two organizations, or two people or roles.
- **Interviews**: used to ask questions of stakeholders to uncover needs, identify problems, or discover opportunities.
- **Mind Mapping**: used to generate many ideas from a group of stakeholders in a short period, and to organize and prioritize those ideas.
- **Observation**: used to gain insight about how work is currently done, possibly in different locations and in different circumstances.
- **Process Analysis**: used to understand current processes and to identify opportunities for improvement in those processes.
- **Process Modelling**: used to elicit processes with stakeholders during elicitation activities.
- **Prototyping**: used to elicit and validate stakeholders' needs through an iterative process that creates a model of requirements or designs.
- **Survey or Questionnaire**: used to elicit business analysis information, including information about customers, products, work practices, and attitudes, from a group of people in a structured way and in a relatively short period of time.
- **Workshops**: used to elicit business analysis information, including information about customers, products, work practices, and attitudes, from a group of people in a collaborative, facilitated way.

4.2.7 Stakeholders

- **Customer**: will provide valuable business analysis information during elicitation.
- **Domain Subject Matter Expert**: has expertise in some aspect of the situation and can provide the required business analysis information. Often guides and

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assists the business analyst in identifying appropriate research sources, and may help to arrange research, experiments, and facilitated elicitation.

- **End User**: the user of existing and future solutions, who should participate in elicitation.
- **Implementation Subject Matter Expert**: designs and implements a solution and provides specialist expertise, and can participate in elicitation by asking clarifying questions and offering alternatives.
- **Sponsor**: authorizes and ensures that the stakeholders necessary to participate in elicitation are involved.
- **Any stakeholders**: could have relevant knowledge or experience to participate in elicitation activities.

4.2.8 Outputs

- **Elicitation Results (unconfirmed)**: captured information in a format that is specific to the elicitation activity.

4.3 Confirm Elicitation Results

4.3.1 Purpose

The purpose of Confirm Elicitation Results is to check the information gathered during an elicitation session for accuracy and consistency with other information.

4.3.2 Description

Elicited information is confirmed to identify any problems and resolve them before resources are committed to using the information. This review may discover errors, omissions, conflicts, and ambiguity.

The elicitation results can be compared against their source and other elicitation results to ensure consistency. Collaboration with stakeholders might be necessary to ensure their inputs are correctly captured and that they agree with the results of non-facilitated elicitation. If information is not correct, the business analyst determines what is correct, which can require more elicitation. Committing resources to business analysis activities based on unconfirmed elicitation results may mean stakeholder expectations are not met. If the results are inconsistent, additional elicitation might need to be conducted to resolve the discrepancies.

Confirming the elicitation results is a much less rigorous and formal review than occurs during analysis.

4.3.3 Inputs

- **Elicitation Results (unconfirmed)**: capture information in a format specific to the elicitation activity.

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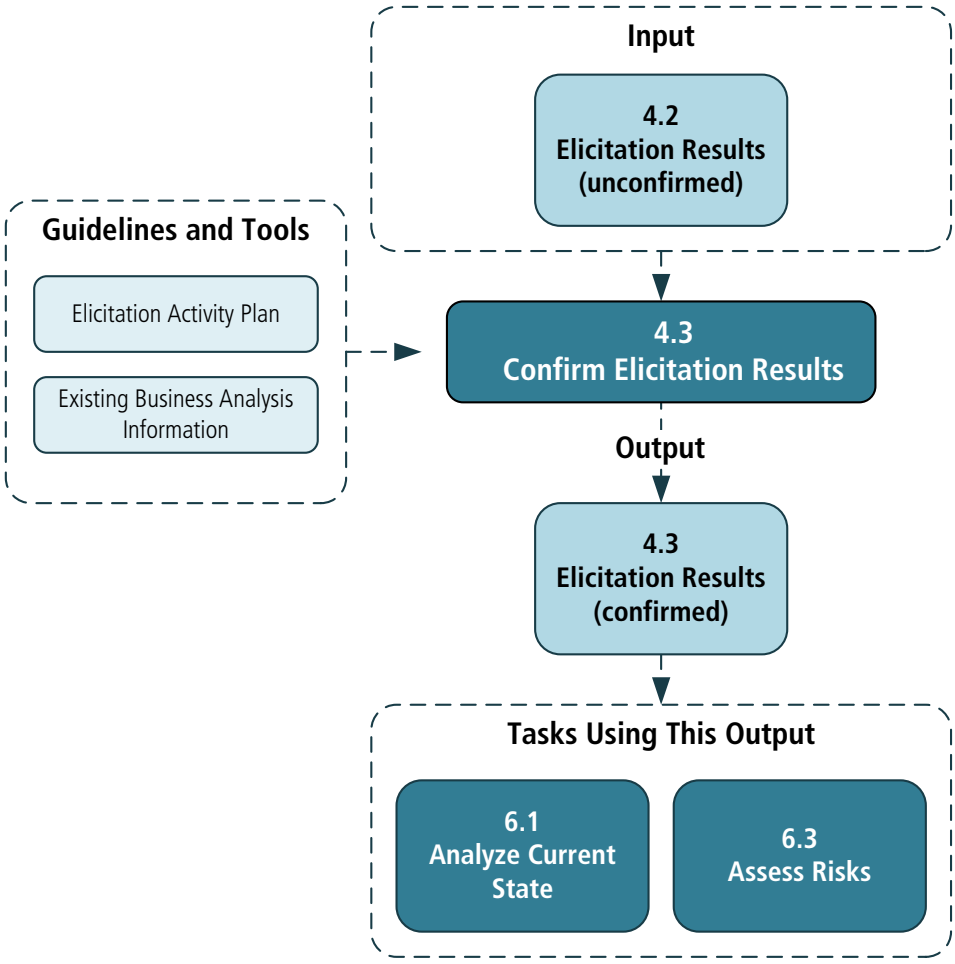
Figure 4.3.1: Confirm Elicitation Results



4.3.4 Elements

.1 Compare Elicitation Results Against Source Information

Task Conduct Elicitation (p. 61) describes sources from which elicitation results may be derived, including documents and stakeholder knowledge. The business analyst may lead follow-up meetings where stakeholders correct the elicitation results. Stakeholders may also confirm the elicitation results independently.

.2 Compare Elicitation Results Against Other Elicitation Results

Business analysts compare results collected through multiple elicitation activities to confirm that the information is consistent and accurately represented. As comparisons are drawn, business analysts identify variations in results and resolve them in collaboration with stakeholders. Comparisons may also be made with historical data to confirm more recent elicitation results.

Inconsistencies in elicitation results are often uncovered when business analysts develop specifications and models. These models may be developed during an elicitation activity to improve collaboration.

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4.3.5 Guidelines and Tools

- **Elicitation Activity Plan**: used to guide which alternative sources and which elicitation results are to be compared.
- **Existing Business Analysis Information**: can be used to confirm the results of elicitation activities or to develop additional questions to draw out more detailed information.

4.3.6 Techniques

- **Document Analysis**: used to confirm elicitation results against source information or other existing documents.
- **Interviews**: used to confirm the business analysis information and to confirm that the integration of that information is correct.
- **Reviews**: used to confirm a set of elicitation results. Such reviews could be informal or formal depending on the risks of not having correct, useful, and relevant information.
- **Workshops**: used to conduct reviews of the drafted elicitation results using any level of formality. A predetermined agenda, scripts, or scenario tests may be used to walk through the elicitation results, and feedback is requested from the participants and recorded.

4.3.7 Stakeholders

- **Domain Subject Matter Experts**: people with substantial knowledge, experience, or expertise about the business analysis information being elicited, or about the change or the solution, help to confirm that elicitation results are correct, and can help to identify omissions, inconsistencies and conflicts in elicitation results. They can also confirm that the right business analysis information has been elicited.
- **Any stakeholder**: all types of stakeholders may need to participate in confirming elicitation results.

4.3.8 Outputs

- **Elicitation Results (confirmed)**: integrated output that the business analyst and other stakeholders agree correctly reflects captured information and confirms that it is relevant and useful as an input to further work.

4.4 Communicate Business Analysis Information

4.4.1 Purpose

The purpose of Communicate Business Analysis Information is to ensure stakeholders have a shared understanding of business analysis information.

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4.4.2 Description

Business analysts must communicate appropriate information to stakeholders at the right time and in formats that meet their needs. Consideration is given to expressing the information in language, tone, and style that is appropriate to the audience.

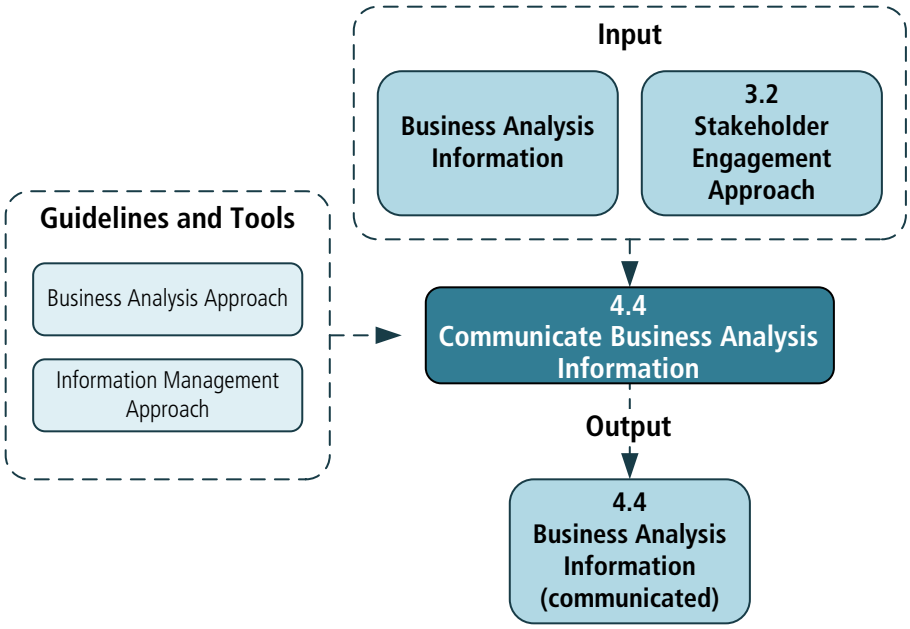
Communication of business analysis information is bi-directional and iterative. It involves determining the recipients, content, purpose, context, and expected outcomes. Task Plan Stakeholder Engagement (p. 31) evaluates communication needs and plans anticipated messages.

Communicating information does not simply involve pushing information out and assuming it was received and understood. Business analysts engage stakeholders to ensure they understand the information and gain agreement. The business analyst acts on any disagreements. The method of delivering the information may need to change if the stakeholders are not receiving or understanding it. Multiple forms of communication might be required for the same information.

4.4.3 Inputs

- **Business Analysis Information**: any kind of information at any level of detail that is used as an input or output of business analysis work. Business analysis information becomes an input for this task when the need is discovered to communicate the information to additional stakeholders.
- **Stakeholder Engagement Approach**: describes stakeholder groups, roles, and general needs regarding communication of business analysis information.

Figure 4.4.1: Communicate Business Analysis Information Input/Output Diagram



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4.4.4 Elements

.1 Determine Objectives and Format of Communication

Business analysis information packages may be prepared for a number of reasons including—but not limited to—the following:

- communication of requirements and designs to stakeholders,
- early assessment of quality and planning,
- evaluation of possible alternatives,
- formal reviews and approvals,
- inputs to solution design,
- conformance to contractual and regulatory obligations, and
- maintenance for reuse.

The primary goal of developing a package is to convey information clearly and in usable format for continuing change activities. To help decide how to present requirements, business analysts ask the following types of questions:

- Who is the audience of the package?
- What will each type of stakeholder understand and need from the communication?
- What is each stakeholder's preferred style of communication or learning?
- What information is important to communicate?
- Are the presentation and format of the package, and the information contained in the package, appropriate for the type of audience?
- How does the package support other activities?
- Are there any regulatory or contractual constraints to conform to?

Possible forms for packages may include:

- **Formal Documentation**: is usually based on a template used by the organization and may include text, matrices, or diagrams. It provides a stable, easy to use, long-term record of the information.
- **Informal Documentation**: may include text, diagrams, or matrices that are used during a change but are not part of a formal organizational process.
- **Presentations**: deliver a high-level overview appropriate for understanding goals of a change, functions of a solution, or information to support decision making.

Consideration is given to the best way to combine and present the materials to convey a cohesive and effective message to one or more stakeholder groups. Packages can be stored in different online or offline repositories, including documents or tools.

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.2 Communicate Business Analysis Package

The purpose of communicating the business analysis package is to provide stakeholders with the appropriate level of detail about the change so they can understand the information it contains. Stakeholders are given the opportunity to review the package, ask questions about the information, and raise any concerns they may have.

Selecting the appropriate communication platform is also important. Common communication platforms include:

- **Group collaboration**: used to communicate the package to a group of relevant stakeholders at the same time. It allows immediate discussion about the information and related issues.
- **Individual collaboration**: used to communicate the package to a single stakeholder at a time. It can be used to gain individual understanding of the information when a group setting is not feasible, most productive, or going to yield the best results.
- **E-mail or other non-verbal methods**: used to communicate the package when there is a high maturity level of information that will need little or no verbal explanation to support it.

4.4.5 Guidelines and Tools

- **Business Analysis Approach**: describes how the various types of information will be disseminated rather than what will be disseminated. It describes the level of detail and formality required, frequency of the communications, and how communications could be affected by the number and geographic dispersion of stakeholders.
- **Information Management Approach**: helps determine how business analysis information will be packaged and communicated to stakeholders.

4.4.6 Techniques

- **Interviews**: used to individually communicate information to stakeholders.
- **Reviews**: used to provide stakeholders with an opportunity to express feedback, request required adjustments, understand required responses and actions, and agree or provide approvals. Reviews can be used during group or individual collaboration.
- **Workshops**: used to provide stakeholders with an opportunity to express feedback and to understand required adjustments, responses, and actions. They are also useful for gaining consensus and providing approvals. Typically used during group collaboration.

4.4.7 Stakeholders

- **End User**: needs to be communicated with frequently so they are aware of relevant business analysis information.
- **Customer**: needs to be communicated with frequently so they are aware of relevant business analysis information.

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- **Domain Subject Matter Expert**: needs to understand the business analysis information as part of confirming and validating it throughout the change initiative.
- **Implementation Subject Matter Expert**: needs to be aware of and understand the business analysis information, particularly requirements and designs, for implementation purposes.
- **Tester**: needs to be aware of and understand the business analysis information, particularly requirements and designs for testing purposes.
- **Any stakeholder**: all types of stakeholders will likely need to be communicated with at some point during the change initiative.

4.4.8 Outputs

- **Business Analysis Information (communicated)**: business analysis information is considered communicated when the target stakeholders have reached an understanding of its content and implications.

4.5 Manage Stakeholder Collaboration

4.5.1 Purpose

The purpose of Manage Stakeholder Collaboration is to encourage stakeholders to work towards a common goal.

4.5.2 Description

Business analysis work lends itself to many collaboration opportunities between groups of stakeholders on the business analysis work products. Stakeholders hold various degrees of influence and authority over the approval of work products, and are also an important source of needs, constraints, and assumptions. As the business analysis work progresses, the business analyst identifies stakeholders, confirms their roles, and communicates with them to ensure that the right stakeholders participate at the right times and in the appropriate roles.

Managing stakeholder collaboration is an ongoing activity. Although managing stakeholder collaboration begins once stakeholders have been identified and analyzed, new stakeholders may be identified at any point during an initiative. As new stakeholders are identified, their role, influence, and relationship to the initiative are analyzed. Each stakeholder's role, responsibility, influence, attitude, and authority may change over time.

The more significant the impact of the change or its visibility within the organization, the more attention is directed to managing stakeholder collaboration. Business analysts manage stakeholder collaboration to capitalize on positive reactions, and mitigate or avoid negative reactions. The business analyst should constantly monitor and assess each stakeholder’s attitude to determine if it might affect their involvement in the business analysis activities.

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Poor relationships with stakeholders can have many detrimental effects on business analysis, including:

- failure to provide quality information,
- strong negative reactions to setbacks and obstacles,
- resistance to change,
- lack of support for, and participation in, business analysis work, and
- business analysis information being ignored.

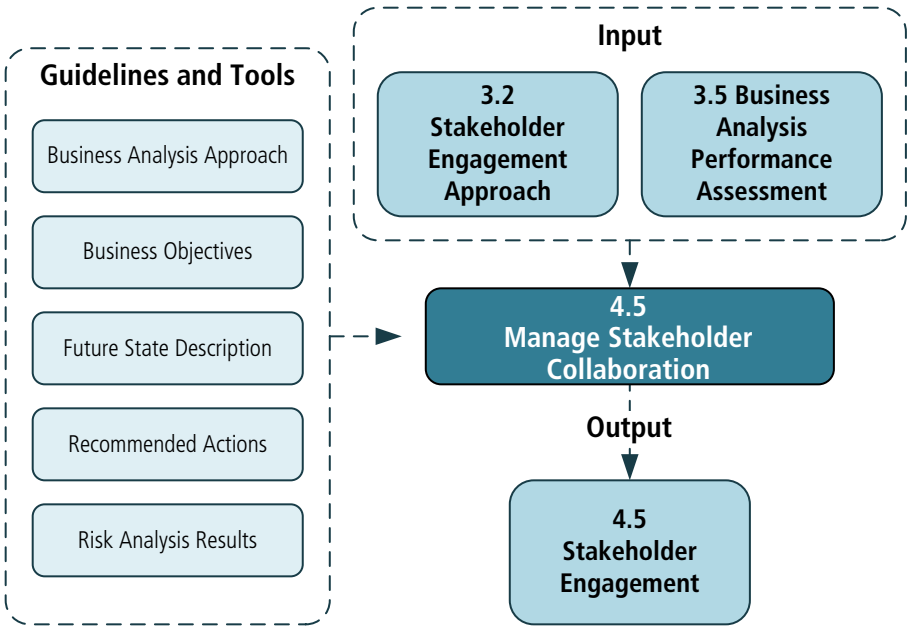
These effects can be modified in part through strong, positive, and trust-based relationships with stakeholders. Business analysts actively manage relationships with stakeholders who:

- provide services to the business analyst, including inputs to business analysis tasks and other support activities,
- depend on services provided by the business analyst, including outputs of business analysis tasks, and
- participate in the execution of business analysis tasks.

4.5.3 Inputs

- **Stakeholder Engagement Approach**: describes the types of expected engagement with stakeholders and how they might need to be managed.
- **Business Analysis Performance Assessment**: provides key information about the effectiveness of business analysis tasks being executed, including those focused on stakeholder engagement.

Figure 4.5.1: Manage Stakeholder Collaboration Input/Output Diagram



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4.5.4 Elements

.1 Gain Agreement on Commitments

Stakeholders participate in business analysis activities that may require time and resource commitments. The business analyst and stakeholders identify and agree upon these commitments as early in the initiative as possible. The specific details of the commitments can be communicated formally or informally, as long as there is explicit understanding of the expectations and desired outcomes of the commitment.

There may be dialogue and negotiation regarding the terms and conditions of the commitments. Effective negotiation, communication, and conflict resolution skills are important to effective stakeholder management (see Negotiation and Conflict Resolution (p. 210)).

.2 Monitor Stakeholder Engagement

Business analysts monitor the participation and performance of stakeholders to ensure that:

- the right subject matter experts (SMEs) and other stakeholders are participating effectively,
- stakeholder attitudes and interest are staying constant or improving,
- elicitation results are confirmed in a timely manner, and
- agreements and commitments are maintained.

Business analysts continually monitor for such risks as:

- stakeholders being diverted to other work,
- elicitation activities not providing the quality of business analysis information required, and
- delayed approvals.

.3 Collaboration

Stakeholders are more likely to support change if business analysts collaborate with them and encourage the free flow of information, ideas, and innovations. Genuine stakeholder engagement requires that all stakeholders involved feel that they are heard, their opinions matter, and their contributions are recognized. Collaboration involves regular, frequent, and bi-directional communication. Collaborative relationships help maintain the free flow of information when obstacles and setbacks occur, and promote a shared effort to resolve problems and achieve desired outcomes.

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4.5.5 Guidelines and Tools

- **Business Analysis Approach**: describes the nature and level of collaboration required from each stakeholder group to perform planned business analysis activities.
- **Business Objectives**: describe the desired direction needed to achieve the future state. They can be used to focus diverse stakeholders on a common vision of the desired business outcomes.
- **Future State Description**: defines the desired future state and the expected value it delivers which can be used to focus diverse stakeholders on the common goal.
- **Recommended Actions**: communicating what should be done to improve the value of a solution can help to galvanize support and focus stakeholders on a common goal.
- **Risk Analysis Results**: stakeholder-related risks will need to be addressed to ensure stakeholder collaboration activities are successful.

4.5.6 Techniques

- **Collaborative Games**: used to stimulate teamwork and collaboration by temporarily immersing participants in a safe and fun situation in which they can share their knowledge and experience on a given topic, identify hidden assumptions, and explore that knowledge in ways that may not occur during the course of normal interactions.
- **Lessons Learned**: used to understand stakeholders' satisfaction or dissatisfaction, and offer them an opportunity to help improve the working relationships.
- **Risk Analysis and Management**: used to identify and manage risks as they relate to stakeholder involvement, participation, and engagement.
- **Stakeholder List, Map, or Personas**: used to determine who is available to participate in the business analysis work, show the informal relationships between stakeholders, and understand which stakeholders should be consulted about different kinds of business analysis information.

4.5.7 Stakeholders

- **All stakeholders**: all types of stakeholders who might be involved in collaboration during change.

4.5.8 Outputs

- **Stakeholder Engagement**: willingness from stakeholders to engage in business analysis activities and interact with the business analyst when necessary.

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5 Requirements Life Cycle Management

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The Requirements Life Cycle Management knowledge area describes the tasks that business analysts perform in order to manage and maintain requirements and design information from inception to retirement. These tasks describe establishing meaningful relationships between related requirements and designs, assessing changes to requirements and designs when changes are proposed, and analyzing and gaining consensus on changes.

The purpose of requirements life cycle management is to ensure that business, stakeholder, and solution requirements and designs are aligned to one another and that the solution implements them. It involves a level of control over requirements and over how requirements will be implemented in the actual solution to be constructed and delivered. It also helps to ensure that business analysis information is available for future use.

The requirements life cycle:

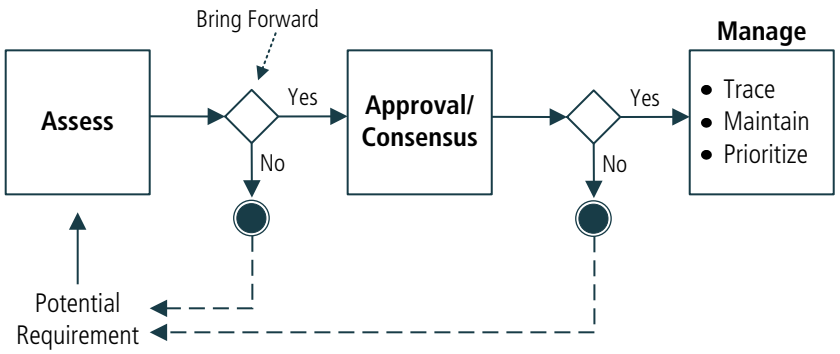
- begins with the representation of a business need as a requirement,
- continues through the development of a solution, and
- ends when a solution and the requirements that represent it are retired.

The management of requirements does not end once a solution is implemented. Throughout the life of a solution, requirements continue to provide value when they are managed appropriately.

Within the Requirements Life Cycle Management knowledge area, the concept of a life cycle is separate from a methodology or process used to govern business analysis work. Life cycle refers to the existence of various phases or states that requirements pass through as part of any change. Requirements may be in multiple states at one time.

The states listed here are not intended to be a comprehensive listing.

Figure 5.0.1: Requirements Life Cycle Management



The Requirements Life Cycle Management knowledge area includes the following tasks:

- **Trace Requirements**: analyzes and maintains the relationships between requirements, designs, solution components, and other work products for impact analysis, coverage, and allocation.
- **Maintain Requirements**: ensures that requirements and designs are accurate and current throughout the life cycle and facilitates reuse where appropriate.
- **Prioritize Requirements**: assesses the value, urgency, and risks associated with particular requirements and designs to ensure that analysis and/or delivery work is done on the most important ones at any given time.
- **Assess Requirements Changes**: evaluates new and changing stakeholder requirements to determine if they need to be acted on within the scope of a change.
- **Approve Requirements**: works with stakeholders involved in the governance process to reach approval and agreement on requirements and designs.

The Core Concept Model in Requirements Life Cycle Management

The *Business Analysis Core Concept Model*™ (*BACCM*™) describes the relationships among the six core concepts.

The following table describes the usage and application of each of the core concepts within the context of Requirements Life Cycle Management.

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Table 5.0.1: The Core Concept Model in Requirements Life Cycle Management

Core Concept	During Requirements Life Cycle Management, business analysts...
Change: the act of transformation in response to a need.	manage how proposed changes to requirements and designs are evaluated during an initiative.
Need: a problem or opportunity to be addressed.	trace, prioritize and maintain requirements to ensure that the need is met.
Solution: a specific way of satisfying one or more needs in a context.	trace requirements and designs to solution components to ensure that the solution satisfies the need.
Stakeholder: a group or individual with a relationship to the change, the need, or the solution.	work closely with key stakeholders to maintain understanding, agreement, and approval of requirements and designs.
Value: the worth, importance, or usefulness of something to a stakeholder within a context.	maintain requirements for reuse to extend value beyond the current initiative.
Context: the circumstances that influence, are influenced by, and provide understanding of the change.	analyze the context to support tracing and prioritization activities.

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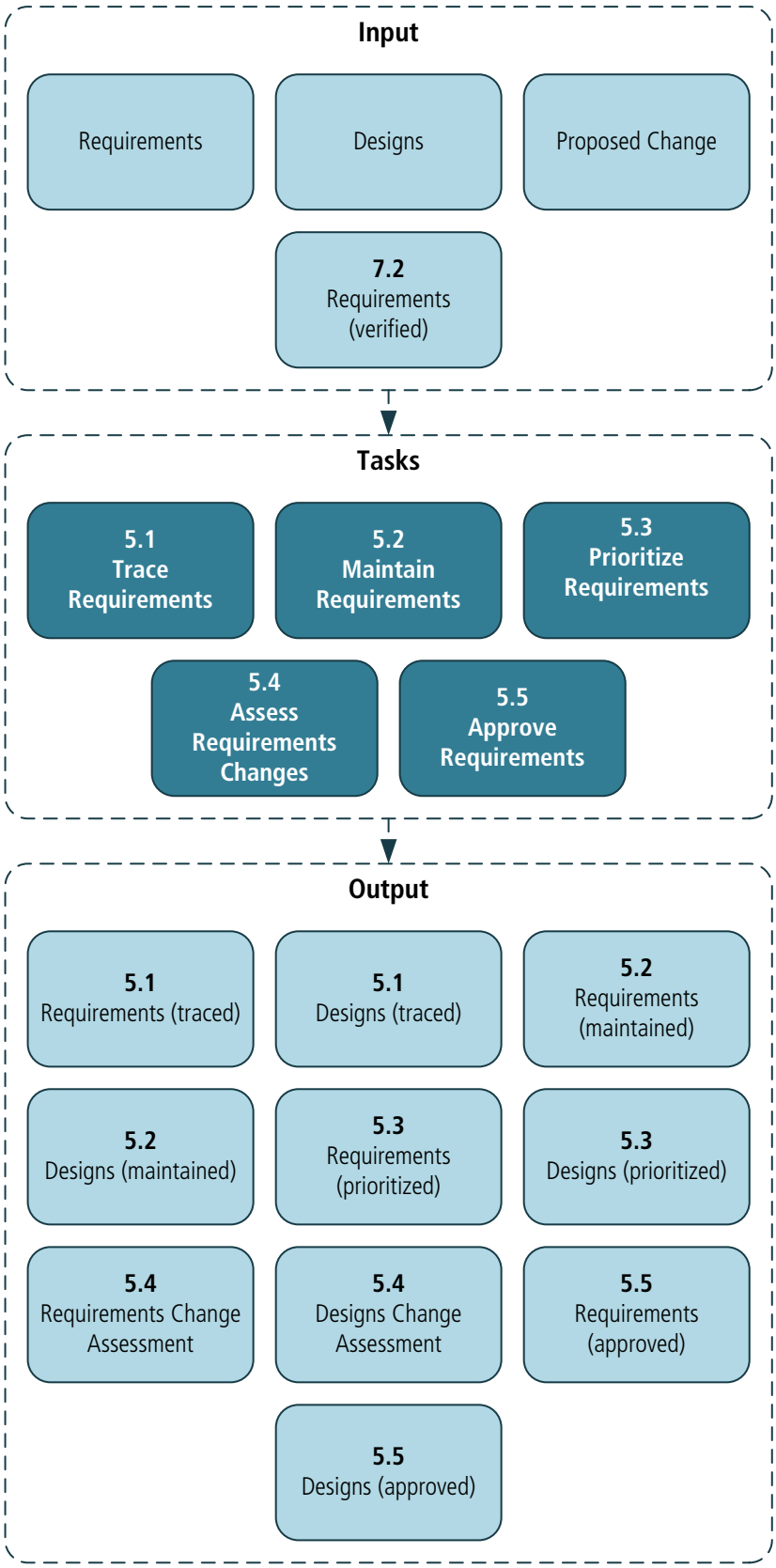
Figure 5.0.1: Requirements Life Cycle Management Input/Output Diagram



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5.1 Trace Requirements

5.1.1 Purpose

The purpose of Trace Requirements is to ensure that requirements and designs at different levels are aligned to one another, and to manage the effects of change to one level on related requirements.

5.1.2 Description

Requirements traceability identifies and documents the lineage of each requirement, including its backward traceability, its forward traceability, and its relationship to other requirements. Traceability is used to help ensure that the solution conforms to requirements and to assist in scope, change, risk, time, cost, and communication management. It is also used to detect missing functionality or to identify if there is implemented functionality that is not supported by any requirement.

Traceability enables:

- faster and simpler impact analysis,
- more reliable discovery of inconsistencies and gaps in requirements,
- deeper insights into the scope and complexity of a change, and
- reliable assessment of which requirements have been addressed and which have not.

It is often difficult to accurately represent needs and solutions without taking into account the relationships that exist between them. While traceability is valuable, the business analyst balances the number of relationship types with the benefit gained by representing them. Traceability also supports both requirements allocation and release planning by providing a direct line of sight from requirement to expressed need.

The following images show examples of visual representations of traceability for a process and for software requirements.

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Figure 5.1.1: Process Traceability

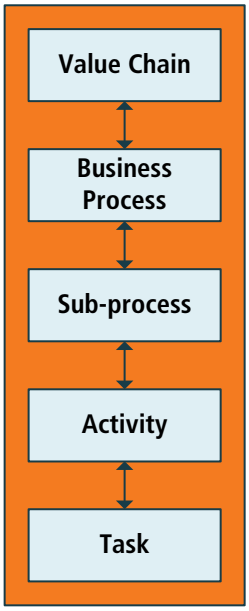
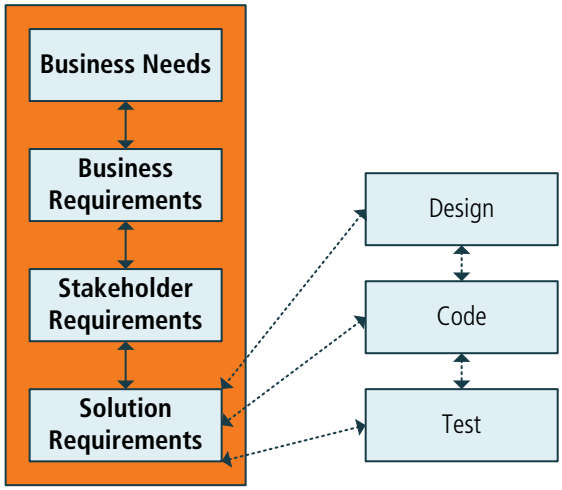


Figure 5.1.2: Software Requirements Traceability



5.1.3 Inputs

- **Requirements**: may be traced to other requirements (including goals, objectives, business requirements, stakeholder requirements, solution requirements, and transition requirements), solution components, visuals, business rules, and other work products.
- **Designs**: may be traced to other requirements, solution components, and other work products.

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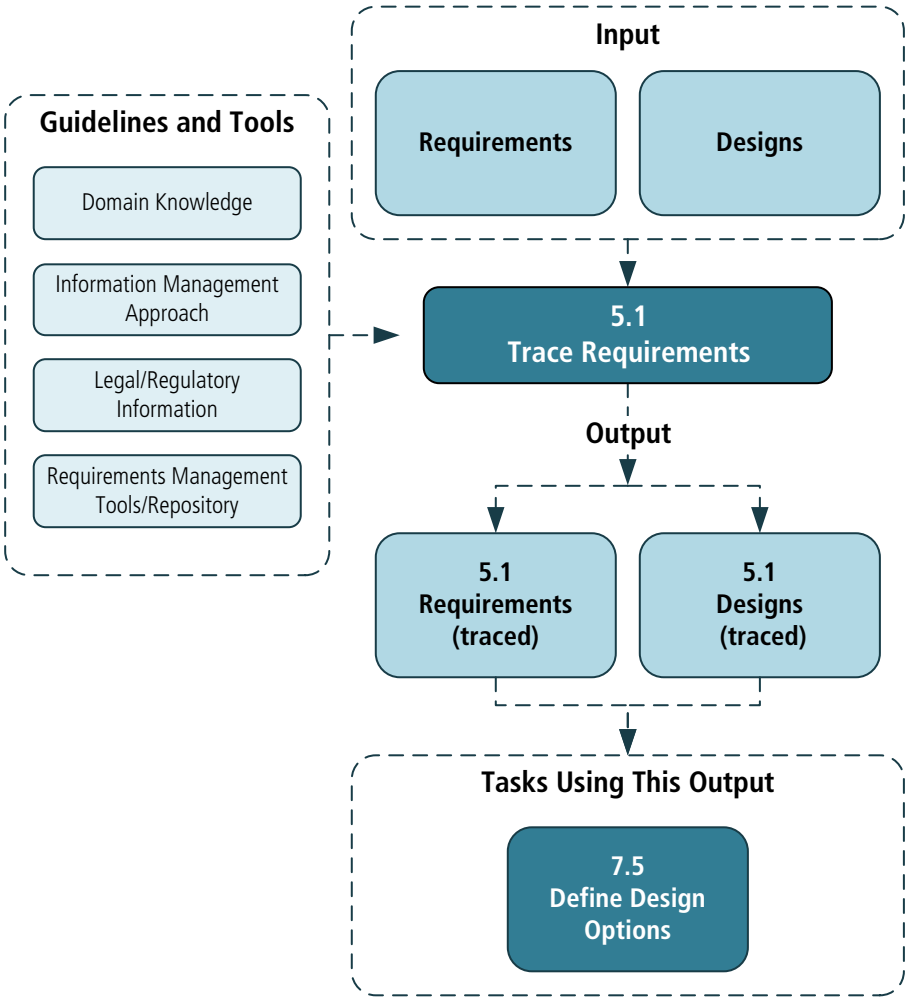
Figure 5.1.3: Trace Requirements Input/Output Diagram



5.1.4 Elements

.1 Level of Formality

When tracing requirements, business analysts consider the value that each link is supposed to deliver, as well as the nature and use of the specific relationships that are being created.

The effort to trace requirements grows significantly when the number of requirements or level of formality increases.

.2 Relationships

There are several types of relationships that the business analyst considers when defining the traceability approach:

- **Derive**: relationship between two requirements, used when a requirement is derived from another requirement. This type of relationship is appropriate to link the requirements on different levels of abstraction. For example, a solution requirement derived from a business or a stakeholder requirement.

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- **Depends**: relationship between two requirements, used when a requirement depends on another requirement. Types of dependency relationships include:
  - **Necessity**: when it only makes sense to implement a particular requirement if a related requirement is also implemented.
  - **Effort**: when a requirement is easier to implement if a related requirement is also implemented.
- **Satisfy**: relationship between an implementation element and the requirements it is satisfying. For example, the relationship between a functional requirement and a solution component that is implementing it.
- **Validate**: relationship between a requirement and a test case or other element that can determine whether a solution fulfills the requirement.

.3 Traceability Repository

Requirements traceability is documented and maintained in accordance with the methods identified by the business analysis approach. Requirements management tools can provide significant benefits when there is a need to trace a large number of requirements that may be deemed unmanageable with manual approaches.

5.1.5 Guidelines and Tools

- **Domain Knowledge**: knowledge of and expertise in the business domain needed to support traceability.
- **Information Management Approach**: provides decisions from planning activities concerning the traceability approach.
- **Legal/Regulatory Information**: describes legislative rules or regulations that must be followed. These may need to be considered when defining traceability rules.
- **Requirements Management Tools/Repository**: used to store and manage business analysis information. The tool may be as simple as a text document or as complex as a dedicated requirements management tool.

5.1.6 Techniques

- **Business Rules Analysis**: used to trace business rules to requirements that they support, or rules that support requirements.
- **Functional Decomposition**: used to break down solution scope into smaller components for allocation, as well as to trace high-level concepts to low-level concepts.
- **Process Modelling**: used to visually show the future state process, as well as tracing requirements to the future state process.
- **Scope Modelling**: used to visually depict scope, as well as trace requirements to the area of scope the requirement supports.

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5.1.7 Stakeholders

- **Customers**: are affected by how and when requirements are implemented, and may have to be consulted about, or agree to, the traceability relationships.
- **Domain Subject Matter Expert**: may have recommendations regarding the set of requirements to be linked to a solution component or to a release.
- **End User**: may require specific dependency relationships that allow certain requirements to be implemented at the same time or in a specific sequence.
- **Implementation Subject Matter Expert**: traceability ensures that the solution being developed meets the business need and brings awareness of dependencies between solution components during implementation.
- **Operational Support**: traceability documentation provides another reference source for help desk support.
- **Project Manager**: traceability supports project change and scope management.
- **Sponsor**: is required to approve the various relationships.
- **Suppliers**: are affected by how and when requirements are implemented.
- **Tester**: needs to understand how and where requirements are implemented when creating test plans and test cases, and may trace test cases to requirements.

5.1.8 Outputs

- **Requirements (traced)**: have clearly defined relationships to other requirements, solution components, or releases, phases, or iterations, within a solution scope, such that coverage and the effects of change are clearly identifiable.
- **Designs (traced)**: clearly defined relationships to other requirements, solution components, or releases, phases, or iterations, within a solution scope, such that coverage and the effects of change are clearly identifiable.

5.2 Maintain Requirements

5.2.1 Purpose

The purpose of Maintain Requirements is to retain requirement accuracy and consistency throughout and beyond the change during the entire requirements life cycle, and to support reuse of requirements in other solutions.

5.2.2 Description

A requirement that represents an ongoing need must be maintained to ensure that it remains valid over time.

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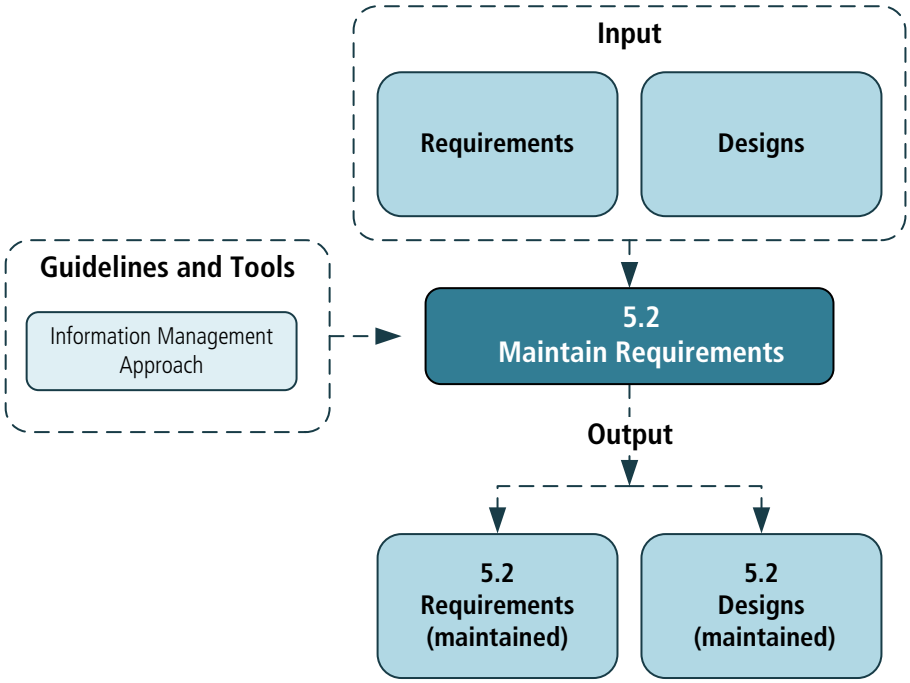
In order to maximize the benefits of maintaining and reusing requirements, the requirements should be:

- consistently represented,
- reviewed and approved for maintenance using a standardized process that defines proper access rights and ensures quality, and
- easily accessible and understandable.

5.2.3 Inputs

- **Requirements**: include goals, objectives, business requirements, stakeholder requirements, solution requirements, and transition requirements. These should be maintained throughout their life cycle.
- **Designs**: can be maintained throughout their life cycle, as needed.

Figure 5.2.1: Maintain Requirements Input/Output Diagram



5.2.4 Elements

.1 Maintain Requirements

Requirements are maintained so that they remain correct and current after an approved change. Business analysts are responsible for conducting maintenance to ensure this level of accuracy is retained. For requirements to be properly maintained they must be clearly named and defined, and easily available to stakeholders.

Business analysts also maintain the relationships among requirements, sets of requirements, and associated business analysis information to ensure the context and original intent of the requirement is preserved. Repositories with accepted

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taxonomies assist in establishing and maintaining links between maintained requirements, and facilitate requirements and designs traceability.

.2 Maintain Attributes

While eliciting requirements, business analysts elicit requirement attributes. Information such as the requirement's source, priority, and complexity aid in managing each requirement throughout the life cycle. Some attributes change as the business analyst uncovers more information and conducts further analysis. An attribute may change even though the requirement does not.

.3 Reusing Requirements

There are situations in which requirements can be reused.

Requirements that are candidates for long-term use by the organization are identified, clearly named, defined, and stored in a manner that makes them easily retrievable by other stakeholders. Depending on the level of abstraction and intended need being addressed, requirements can be reused:

- within the current initiative,
- within similar initiatives,
- within similar departments, and
- throughout the entire organization.

Requirements at high levels of abstraction may be written with limited reference to specific solutions. Requirements that are represented in a general manner, without direct ties to a particular tool or organizational structure, tend to be more reusable. These requirements are also less subject to revision during a change. As requirements are expressed in more detail, they become more tightly associated with a specific solution or solution option. Specific references to applications or departments limit the reuse of requirements and designs across an organization.

Requirements that are intended for reuse reflect the current state of the organization. Stakeholders validate the proposed requirements for reuse before they can be accepted into a change.

5.2.5 Guidelines and Tools

- **Information Management Approach**: indicates how requirements will be managed for reuse.

5.2.6 Techniques

- **Business Rules Analysis**: used to identify business rules that may be similar across the enterprise in order to facilitate reuse.
- **Data Flow Diagrams**: used to identify information flow that may be similar across the enterprise in order to facilitate reuse.
- **Data Modelling**: used to identify data structure that may be similar across the enterprise in order to facilitate reuse.

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- **Document Analysis**: used to analyze existing documentation about an enterprise that can serve as the basis for maintaining and reusing requirements.
- **Functional Decomposition**: used to identify requirements associated with the components and available for reuse.
- **Process Modelling**: used to identify requirements associated with the processes that may be available for reuse.
- **Use Cases and Scenarios**: used to identify a solution component that may be utilized by more than one solution.
- **User Stories**: used to identify requirements associated with the story that may be available for reuse.

5.2.7 Stakeholders

- **Domain Subject Matter Expert**: references maintained requirements on a regular basis to ensure they are accurately reflecting stated needs.
- **Implementation Subject Matter Expert**: utilizes maintained requirements when developing regression tests and conducting impact analysis for an enhancement.
- **Operational Support**: maintained requirements are likely to be referenced to confirm the current state.
- **Regulator**: maintained requirements are likely to be referenced to confirm compliance to standards.
- **Tester**: maintained requirements are used by testers to aid in test plan and test case creation.

5.2.8 Outputs

- **Requirements (maintained)**: defined once and available for long-term usage by the organization. They may become organizational process assets or be used in future initiatives. In some cases, a requirement that was not approved or implemented may be maintained for a possible future initiative.
- **Designs (maintained)**: may be reusable once defined. For example, as a self-contained component that can be made available for possible future use.

5.3 Prioritize Requirements

5.3.1 Purpose

The purpose of Prioritize Requirements is to rank requirements in the order of relative importance.

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5.3.2 Description

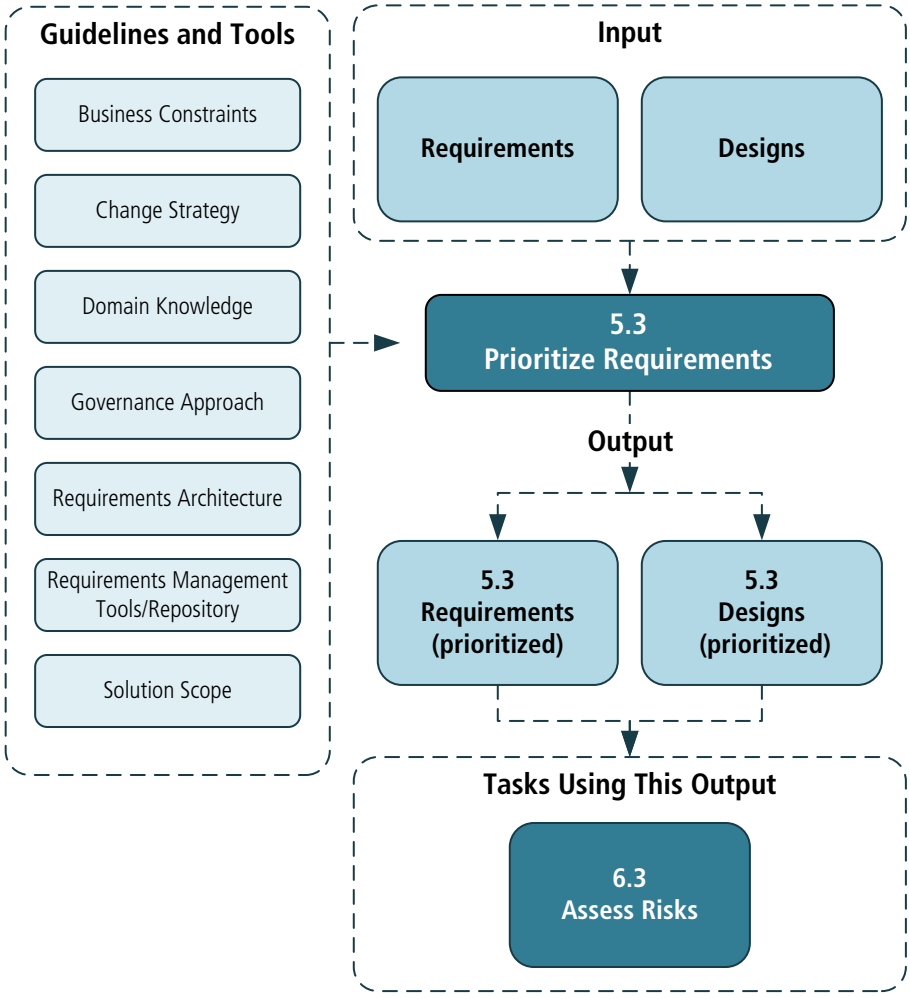
Prioritization is the act of ranking requirements to determine their relative importance to stakeholders. When a requirement is prioritized, it is given greater or lesser priority. Priority can refer to the relative value of a requirement, or to the sequence in which it will be implemented. Prioritization is an ongoing process, with priorities changing as the context changes.

Inter-dependencies between requirements are identified and may be used as the basis for prioritization. Prioritization is a critical exercise that seeks to ensure the maximum value is achieved.

5.3.3 Inputs

- **Requirements**: any requirements in the form of text, matrices, or diagrams that are ready to prioritize.
- **Designs**: any designs in the form of text, prototypes, or diagrams that are ready to prioritize.

Figure 5.3.1: Prioritize Requirements Input/Output Diagram



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5.3.4 Elements

.1 Basis for Prioritization

The basis on which requirements are prioritized is agreed upon by relevant stakeholders as defined in the Business Analysis Planning and Monitoring knowledge area.

Typical factors that influence prioritization include:

- **Benefit**: the advantage that accrues to stakeholders as a result of requirement implementation, as measured against the goals and objectives for the change. The benefit provided can refer to a specific functionality, desired quality, or strategic goal or business objective. If there are multiple stakeholders, each group may perceive benefits differently. Conflict resolution and negotiation may be employed to come to consensus on overall benefit.
- **Penalty**: the consequences that result from not implementing a given requirement. This includes prioritizing requirements in order to meet regulatory or policy demands imposed on the organization, which may take precedence over other stakeholder interests. Penalty may also refer to the negative consequence of not implementing a requirement that improves the experience of a customer.
- **Cost**: the effort and resources needed to implement the requirement. Information about cost typically comes from the implementation team or the vendor. Customers may change the priority of a requirement after learning the cost. Cost is often used in conjunction with other criteria, such as cost-benefit analysis.
- **Risk**: the chance that the requirement cannot deliver the potential value, or cannot be met at all. This may include many factors such as the difficulty of implementing a requirement, or the chance that stakeholders will not accept a solution component. If there is a risk that the solution is not technically feasible, the requirement that is most difficult to implement may be prioritized to the top of the list in order to minimize the resources that are spent before learning that a proposed solution cannot be delivered. A proof of concept may be developed to establish that high risk options are possible.
- **Dependencies**: relationships between requirements where one requirement cannot be fulfilled unless the other requirement is fulfilled. In some situations, it may be possible to achieve efficiencies by implementing related requirements at the same time. Dependencies may also be external to the initiative, including but not limited to other teams' decisions, funding commitments, and resource availability. Dependencies are identified as part of the task Trace Requirements (p. 79).
- **Time Sensitivity**: the 'best before' date of the requirement, after which the implementation of the requirement loses significant value. This includes time-to-market scenarios, in which the benefit derived will be exponentially

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greater if the functionality is delivered ahead of the competition. It can also refer to seasonal functionality that only has value at a specific time of year.

- **Stability**: the likelihood that the requirement will change, either because it requires further analysis or because stakeholders have not reached a consensus about it. If a requirement is not stable, it may have a lower priority in order to minimize unanticipated rework and wasted effort.
- **Regulatory or Policy Compliance**: requirements that must be implemented in order to meet regulatory or policy demands imposed on the organization, which may take precedence over other stakeholder interests.

.2 Challenges of Prioritization

Prioritization is an assessment of relative value. Each stakeholder may value something different. When this occurs, there may be conflict amongst stakeholders. Stakeholders may also have difficulty characterizing any requirement as a lower priority, and this may impact the ability to make necessary trade-offs. In addition, stakeholders may (intentionally or unintentionally) indicate priority to influence the result to their desired outcome.

Different types of requirements may not all respond to the criteria in the same way and may appear to conflict. There may be a need for stakeholders to make trade-offs in prioritization.

.3 Continual Prioritization

Priorities may shift as the context evolves and as more information becomes available. Initially, prioritization is done at a higher level of abstraction. As the requirements are further refined, prioritization is done at a more granular level and will incorporate additional bases for prioritization as they become appropriate. The basis for prioritization may be different at various stages of the change. For example, stakeholders may initially prioritize based on benefits. The implementation team may then re-prioritize the requirements based on the sequence in which they must be implemented due to technical constraints. Once the implementation team has provided the cost of each requirement, the stakeholders may re-prioritize yet again.

5.3.5 Guidelines and Tools

- **Business Constraints**: regulatory statutes, contractual obligations and business policies that may define priorities.
- **Change Strategy**: provides information on costs, timelines, and value realization which are used to determine priority of requirements.
- **Domain Knowledge**: knowledge and expertise of the business domain needed to support prioritization.
- **Governance Approach**: outlines the approach for prioritizing requirements.
- **Requirements Architecture**: utilized to understand the relationship with other requirements and work products.

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- **Requirements Management Tools/Repository**: including a requirements attribute for prioritization can help the business analyst to sort and access requirements by priority.
- **Solution Scope**: considered when prioritizing requirements to ensure scope is managed.

5.3.6 Techniques

- **Backlog Management**: used to compare requirements to be prioritized. The backlog can be the location where the prioritization is maintained.
- **Business Cases**: used to assess requirements against identified business goals and objectives to determine importance.
- **Decision Analysis**: used to identify high-value requirements.
- **Estimation**: used to produce estimates for the basis of prioritization.
- **Financial Analysis**: used to assess the financial value of a set of requirements and how the timing of delivery will affect that value.
- **Interviews**: used to gain an understanding of a single or small group of stakeholders' basis of prioritization or priorities.
- **Item Tracking**: used to track issues raised by stakeholders during prioritization.
- **Prioritization**: used to facilitate the process of prioritization.
- **Risk Analysis and Management**: used to understand the risks for the basis of prioritization.
- **Workshops**: used to gain an understanding of stakeholders' basis of prioritization or priorities in a facilitated group setting.

5.3.7 Stakeholders

- **Customer**: verifies that the prioritized requirements will deliver value from a customer or end-user perspective. The customer can also negotiate to have the prioritization changed based on relative value.
- **End User**: verifies that the prioritized requirements will deliver value from a customer or end-user perspective.
- **Implementation Subject Matter Expert**: provides input relating to technical dependencies and can negotiate to have the prioritization changed based on technical constraints.
- **Project Manager**: uses the prioritization as input into the project plan and into the allocation of requirements to releases.
- **Regulator**: can verify that the prioritization is consistent with legal and regulatory constraints.
- **Sponsor**: verifies that the prioritized requirements will deliver value from an organizational perspective.

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5.3.8 Outputs

- **Requirements (prioritized)**: prioritized or ranked requirements are available for additional work, ensuring that the highest valued requirements are addressed first.
- **Designs (prioritized)**: prioritized or ranked designs are available for additional work, ensuring that the highest valued designs are addressed first.

5.4 Assess Requirements Changes

5.4.1 Purpose

The purpose of Assess Requirements Changes is to evaluate the implications of proposed changes to requirements and designs.

5.4.2 Description

The Assess Requirements Changes task is performed as new needs or possible solutions are identified. These may or may not align to the change strategy and/or solution scope. Assessment must be performed to determine whether a proposed change will increase the value of the solution, and if so, what action should be taken.

Business analysts assess the potential effect of the change to solution value, and whether proposed changes introduce conflicts with other requirements or increase the level of risk. Business analysts also ensure each proposed change can be traced back to a need.

When assessing changes, business analysts consider if each proposed change:

- aligns with the overall strategy,
- affects value delivered to the business or stakeholder groups,
- impacts the time to deliver or the resources required to deliver the value, and
- alters any risks, opportunities, or constraints associated with the overall initiative.

The results of the assessment must support the decision making and change control approaches defined by the task Plan Business Analysis Governance (p. 37).

5.4.3 Inputs

- **Proposed Change**: can be identified at any time and impact any aspect of business analysis work or deliverables completed to date. There are many triggers for a proposed change including business strategy changes, stakeholders, legal requirements, or regulatory changes.

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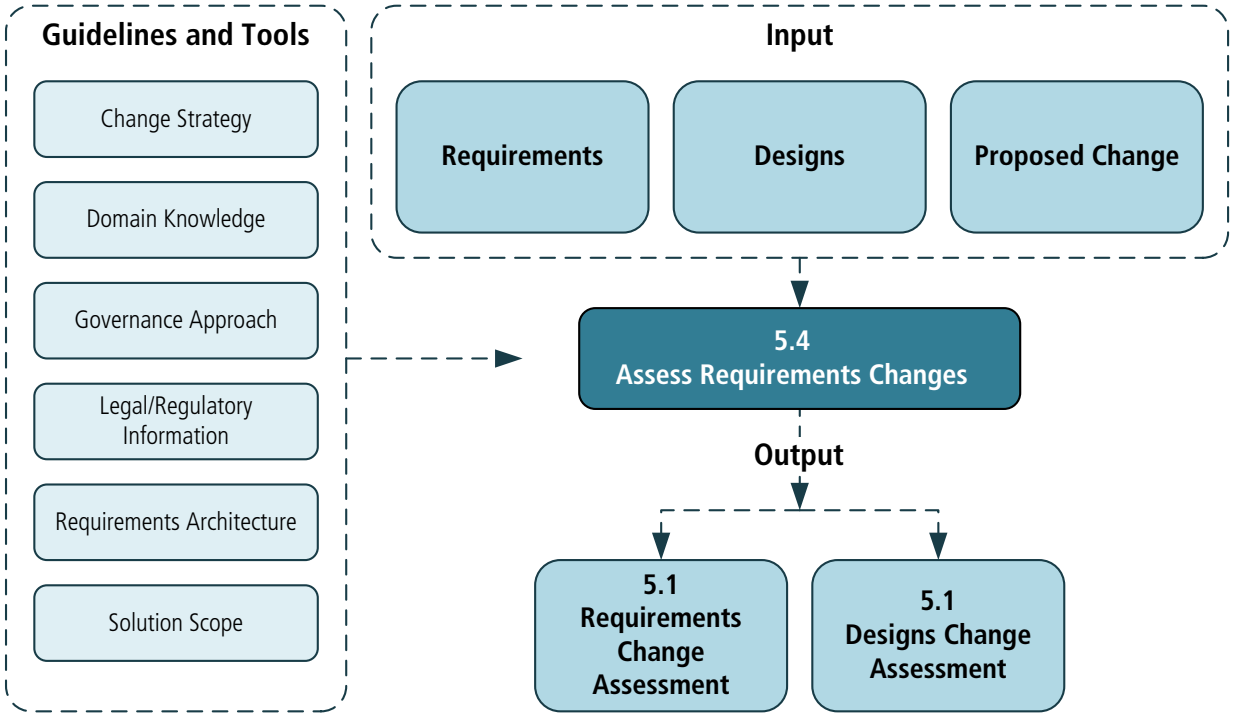
- **Requirements**: may need to be assessed to identify the impact of a proposed modification.
- **Designs**: may need to be assessed to identify the impact of a proposed modification.

Figure 5.4.1: Assess Requirements Changes Input/Output Diagram



5.4.4 Elements

.1 Assessment Formality

Business analysts will determine the formality of the assessment process based on the information available, the apparent importance of the change, and the governance process. Many proposed changes may be withdrawn from consideration or declined before any formal approval is required. A predictive approach may indicate a more formal assessment of proposed changes. In predictive approaches, the impact of each change can be disruptive; the change can potentially generate a substantial reworking of tasks and activities completed in previous activities. An adaptive approach may require less formality in the assessment of proposed changes. While there may be reworking needed as a result of each change, adaptive approaches try to minimize the impact of changes by utilizing iterative and incremental implementation techniques. This idea of continuous evolution may reduce the need for formal impact assessment.

.2 Impact Analysis

Impact analysis is performed to assess or evaluate the effect of a change. Traceability is a useful tool for performing impact analysis. When a requirement

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changes, its relationships to other requirements or solution components can be reviewed. Each related requirement or component may also require a change to support the new requirement.

When considering changes or additions to existing requirements, business analysts assess the impact of the proposed change by considering:

- **Benefit**: the benefit that will be gained by accepting the change.
- **Cost**: the total cost to implement the change including the cost to make the change, the cost of associated rework, and the opportunity costs such as the number of other features that may need to be sacrificed or deferred if the change is approved.
- **Impact**: the number of customers or business processes affected if the change is accepted.
- **Schedule**: the impact to the existing delivery commitments if the change is approved.
- **Urgency**: the level of importance including the factors which drive necessity such as regulator or safety issues.

.3 Impact Resolution

Depending on the planned approach, various stakeholders (including the business analyst) may be authorized to approve, deny, or defer the proposed change. All impacts and resolutions resulting from the change analysis are to be documented and communicated to all stakeholders. How decisions and changes will be made and communicated across an initiative is determined by the task Plan Business Analysis Governance (p. 37).

5.4.5 Guidelines and Tools

- **Change Strategy**: describes the purpose and direction for changes, establishes the context for the change, and identifies the critical components for change.
- **Domain Knowledge**: knowledge of and expertise in the business domain is needed to assess proposed requirements changes.
- **Governance Approach**: provides guidance regarding the change control and decision-making processes, as well as the roles of stakeholders within this process.
- **Legal/Regulatory Information**: describes legislative rules or regulations that must be followed. These may impact requirements and must be considered when making changes.
- **Requirements Architecture**: requirements may be related to each other, therefore the business analyst examines and analyzes the requirement relationships to determine which requirements will be impacted by a requested requirements change.
- **Solution Scope**: must be considered when assessing changes to fully understand the impact of a proposed change.

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5.4.6 Techniques

- **Business Cases**: used to justify a proposed change.
- **Business Rules Analysis**: used to assess changes to business policies and business rules, and develop revised guidance.
- **Decision Analysis**: used to facilitate the change assessment process.
- **Document Analysis**: used to analyze any existing documents that facilitate an understanding of the impact of the change.
- **Estimation**: used to determine the size of the change.
- **Financial Analysis**: used to estimate the financial consequences of a proposed change.
- **Interface Analysis**: used to help business analysts identify interfaces that can be affected by the change.
- **Interviews**: used to gain an understanding of the impact on the organization or its assets from a single or small group of stakeholders.
- **Item Tracking**: used to track any issues or conflicts discovered during impact analysis.
- **Risk Analysis and Management**: used to determine the level of risk associated with the change.
- **Workshops**: used to gain an understanding of the impact or to resolve changes in a group setting.

5.4.7 Stakeholders

- **Customer**: provides feedback concerning the impact the change will have on value.
- **Domain Subject Matter Expert**: has expertise in some aspect of the situation and can provide insight into how the change will impact the organization and value.
- **End User**: uses the solution or is a component of the solution, and can offer information about the impact of the change on their activities.
- **Operational Support**: provides information on both their ability to support the operation of the solution and their need to understand the nature of the change in the solution in order to be able to support it.
- **Project Manager**: reviews the requirements change assessment to determine if additional project work is required for a successful implementation of the solution.

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- **Regulator**: changes are likely to be referenced by auditors to confirm compliance to standards.
- **Sponsor**: accountable for the solution scope and can provide insight to be utilized when assessing change.
- **Tester**: consulted for establishing impact of the proposed changes.

5.4.8 Outputs

- **Requirements Change Assessment**: the recommendation to approve, modify, or deny a proposed change to requirements.
- **Designs Change Assessment**: the recommendation to approve, modify, or deny a proposed change to one or more design components.

5.5 Approve Requirements

5.5.1 Purpose

The purpose of Approve Requirements is to obtain agreement on and approval of requirements and designs for business analysis work to continue and/or solution construction to proceed.

5.5.2 Description

Business analysts are responsible for ensuring clear communication of requirements, designs, and other business analysis information to the key stakeholders responsible for approving that information.

Approval of requirements and designs may be formal or informal. Predictive approaches typically perform approvals at the end of the phase or during planned change control meetings. Adaptive approaches typically approve requirements only when construction and implementation of a solution meeting the requirement can begin. Business analysts work with key stakeholders to gain consensus on new and changed requirements, communicate the outcome of discussions, and track and manage the approval.

5.5.3 Inputs

- **Requirements (verified)**: a set of requirements that have been verified to be of sufficient quality to be used as a reliable body of work for further specification and development.
- **Designs**: a set of designs that have been determined as ready to be used for further specification and development.

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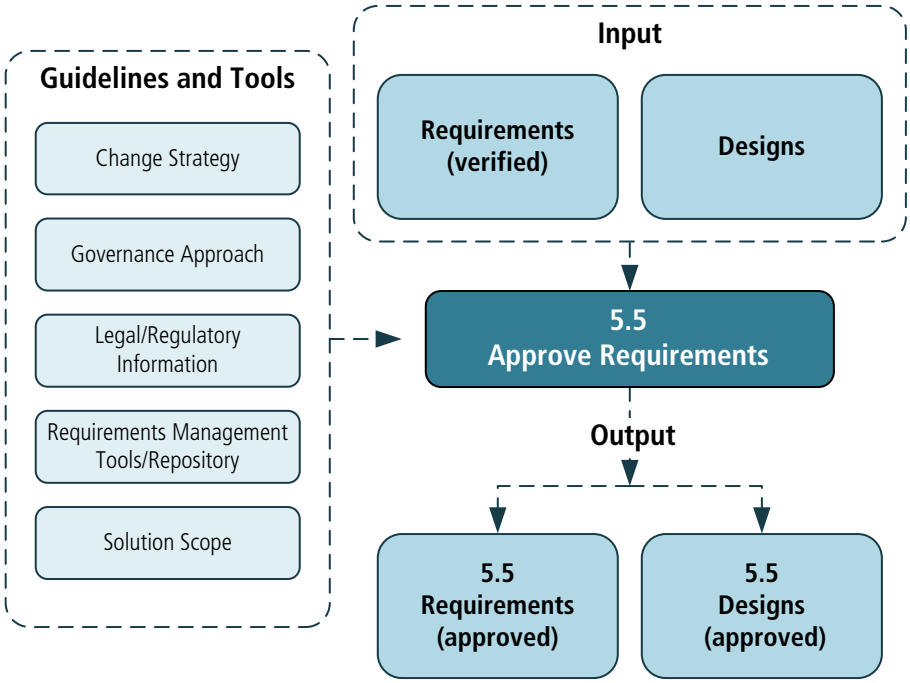
Figure 5.5.1: Approve Requirements Input/Output Diagram



5.5.4 Elements

.1 Understand Stakeholder Roles

The approval process is defined by the task Plan Business Analysis Governance (p. 37). Part of defining the approval process is understanding stakeholder roles and authority levels. Business analysts are responsible for obtaining stakeholder approvals and are required to understand who holds decision-making responsibility and who possesses authority for sign-off across the initiative. Business analysts also consider any influential stakeholders who should be consulted or informed about the requirements. Few stakeholders may have the authority to approve or deny changes, but many stakeholders may be able to influence these decisions.

.2 Conflict and Issue Management

To maintain stakeholder support for the solution, consensus among stakeholders is usually sought prior to requesting approval of requirements. The approach for determining how to secure decisions and resolve conflicts across an initiative is planned for in the task Plan Business Analysis Governance (p. 37).

Stakeholder groups frequently have varying points of view and conflicting priorities. A conflict may arise among stakeholders as a result of different interpretations of requirements or designs and conflicting values placed on them. The business analyst facilitates communication between stakeholders in areas of conflict so that each group has an improved appreciation for the needs of the others. Conflict resolution and issue management may occur quite often, as the business analyst is reviewing requirements and designs, and aiming to secure sign-off.

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.3 Gain Consensus

Business analysts are responsible for ensuring that the stakeholders with approval authority understand and accept the requirements. Approval may confirm that stakeholders believe that sufficient value will be created for the organization to justify investment in a solution. Business analysts obtain approval by reviewing the requirements or changes to requirements with the accountable individuals or groups and requesting that they approve, indicating their agreement with the solution or designs described.

Using the methods and means established in the tasks Plan Business Analysis Governance (p. 37) and Communicate Business Analysis Information (p. 67) business analysts present the requirements to stakeholders for approval. Business analysts facilitate this approval process by addressing any questions or providing additional information when requested.

Complete agreement may not be necessary for a successful change, but if there is a lack of agreement, the associated risks are to be identified and managed accordingly.

.4 Track and Communicate Approval

The business analyst records approval decisions, possibly in requirements maintenance and tracking tools. In order to communicate the status of requirements, it is necessary to keep accurate records of current approval status. Stakeholders must be able to determine what requirements and designs are currently approved and in line for implementation. There may be value in maintaining an audit history of changes to requirements: what was changed, who made the change, the reason for the change, and when it was made.

5.5.5 Guidelines and Tools

- **Change Strategy**: provides information which assists in managing stakeholder consensus regarding the needs of all stakeholders.
- **Governance Approach**: identifies the stakeholders who have the authority and responsibility to approve business analysis information, and explains when such approvals will take place and how they will align to organizational policies.
- **Legal/Regulatory Information**: describes legislative rules or regulations that must be followed. They may impact the requirements and designs approval process.
- **Requirement Management Tools/Repository**: tool to record requirements approvals.
- **Solution Scope**: must be considered when approving requirements to accurately assess alignment and completeness.

5.5.6 Techniques

- **Acceptance and Evaluation Criteria**: used to define approval criteria.

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- **Decision Analysis**: used to resolve issues and gain agreement.
- **Item Tracking**: used to track issues identified during the agreement process.
- **Reviews**: used to evaluate requirements.
- **Workshops**: used to facilitate obtaining approval.

5.5.7 Stakeholders

- **Customer**: may play an active role in reviewing and approving requirements and designs to ensure needs are met.
- **Domain Subject Matter Expert**: may be involved in the review and approval of requirements and designs as defined by stakeholder roles and responsibilities designation.
- **End User**: people who use the solution, or who are a solution component, and may be involved in the review, validation, and prioritization of requirements and designs as defined by the stakeholder roles and responsibilities designation.
- **Operational Support**: responsible for ensuring that requirements and designs are supportable within the constraints imposed by technology standards and organizational capability plans. Operational support personnel may have a role in reviewing and approving requirements.
- **Project Manager**: responsible for identifying and managing risks associated with solution design, development, delivery, implementation, operation and sustainment. The project manager may manage the project plan activities pertaining to review and/or approval.
- **Regulator**: external or internal party who is responsible for providing opinions on the relationship between stated requirements and specific regulations, either formally in an audit, or informally as inputs to requirements life cycle management tasks.
- **Sponsor**: responsible to review and approve the business case, solution or product scope, and all requirements and designs.
- **Tester**: responsible for ensuring quality assurance standards are feasible within the business analysis information. For example, requirements have the testable characteristic.

5.5.8 Outputs

- **Requirements (approved)**: requirements which are agreed to by stakeholders and are ready for use in subsequent business analysis efforts.
- **Designs (approved)**: designs which are agreed to by stakeholders and are ready for use in subsequent business analysis or solution development efforts.

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6 Strategy Analysis

Strategy defines the most effective way to apply the capabilities of an enterprise in order to reach a desired set of goals and objectives. Strategies may exist for the entire enterprise, for a division, department or region, and for a product, project, or iteration.

The Strategy Analysis knowledge area describes the business analysis work that must be performed to collaborate with stakeholders in order to identify a need of strategic or tactical importance (the *business need*), enable the enterprise to address that need, and align the resulting strategy for the change with higher- and lower-level strategies.

Strategy analysis focuses on defining the future and transition states needed to address the business need, and the work required is defined both by that need and the scope of the solution space. It covers strategic thinking in business analysis, as well as the discovery or imagining of possible solutions that will enable the enterprise to create greater value for stakeholders, and/or capture more value for itself.

Strategy analysis provides context to requirements analysis and design definition for a given change. Strategy analysis should be performed as a business need is identified. This allows stakeholders to make the determination of whether to address that need or not. Strategy analysis is an ongoing activity that assesses any changes in that need, in its context, or any new information that may indicate that an adjustment to the change strategy may be required.

The following image illustrates the spectrum of value as business analysis activities progress from delivering potential value to actual value.

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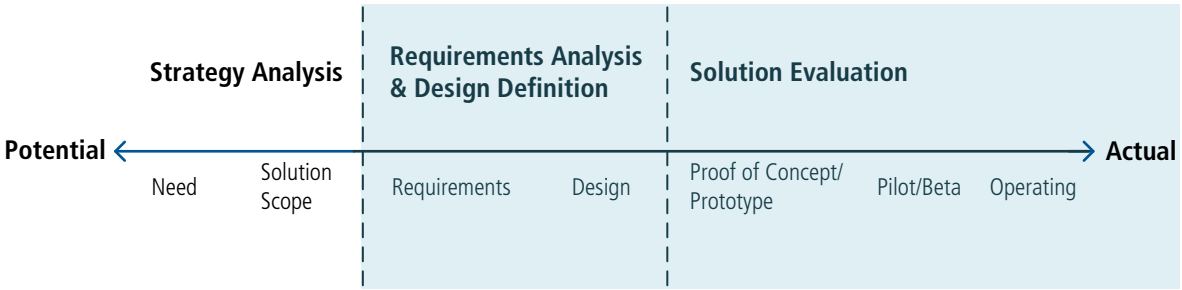
Figure 6.0.1: Business Analysis Value Spectrum



When performing strategy analysis, business analysts must consider the context in which they are working, and how predictable the range of possible outcomes is. When a change will have a predictable outcome, the future state and possible transition states can typically be clearly defined, and a clear strategy can be planned out. If the outcome of a change is difficult to predict, the strategy may need to focus more on mitigating risk, testing assumptions, and changing course until a strategy that will succeed in reaching the business goals can be identified or until the initiative has ended. These tasks may be performed in any order, though they are often performed concurrently, as strategy must be shaped by what is actually achievable.

A strategy may be captured in a strategic plan, product vision, business case, product roadmap, or other artifacts.

The Strategy Analysis knowledge area includes the following tasks:

- **Analyze Current State**: understands the business need and how it relates to the way the enterprise functions today. Sets a baseline and context for change.
- **Define Future State**: defines goals and objectives that will demonstrate that the business need has been satisfied and defines what parts of the enterprise need to change in order to meet those goals and objectives.
- **Assess Risks**: understands the uncertainties around the change, considers the effect those uncertainties may have on the ability to deliver value through a change, and recommends actions to address risks where appropriate.
- **Define Change Strategy**: performs a gap analysis between current and future state, assesses options for achieving the future state, and recommends the highest value approach for reaching the future state including any transition states that may be required along the way.

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The Core Concept Model in Strategy Analysis

The *Business Analysis Core Concept Model*™ (*BACCM*™) describes the relationships among the six core concepts. The following table describes the usage and application of each of the core concepts within the context of Strategy Analysis.

Table 6.0.1: The Core Concept Model in Strategy Analysis

Core Concept	During Strategy Analysis, business analysts...
Change: the act of transformation in response to a need.	define the future state and develop a change strategy to achieve the future state.
Need: a problem or opportunity to be addressed.	identify needs within the current state and prioritize needs to determine the desired future state.
Solution: a specific way of satisfying one or more needs in a context.	define the scope of a solution as part of developing a change strategy.
Stakeholder: a group or individual with a relationship to the change, the need, or the solution.	collaborate with stakeholders to understand the business need and to develop a change strategy and future state that will meet those needs.
Value: the worth, importance, or usefulness of something to a stakeholder within a context.	examine the potential value of the solution to determine if a change is justified.
Context: the circumstances that influence, are influenced by, and provide understanding of the change.	consider the context of the enterprise in developing a change strategy.

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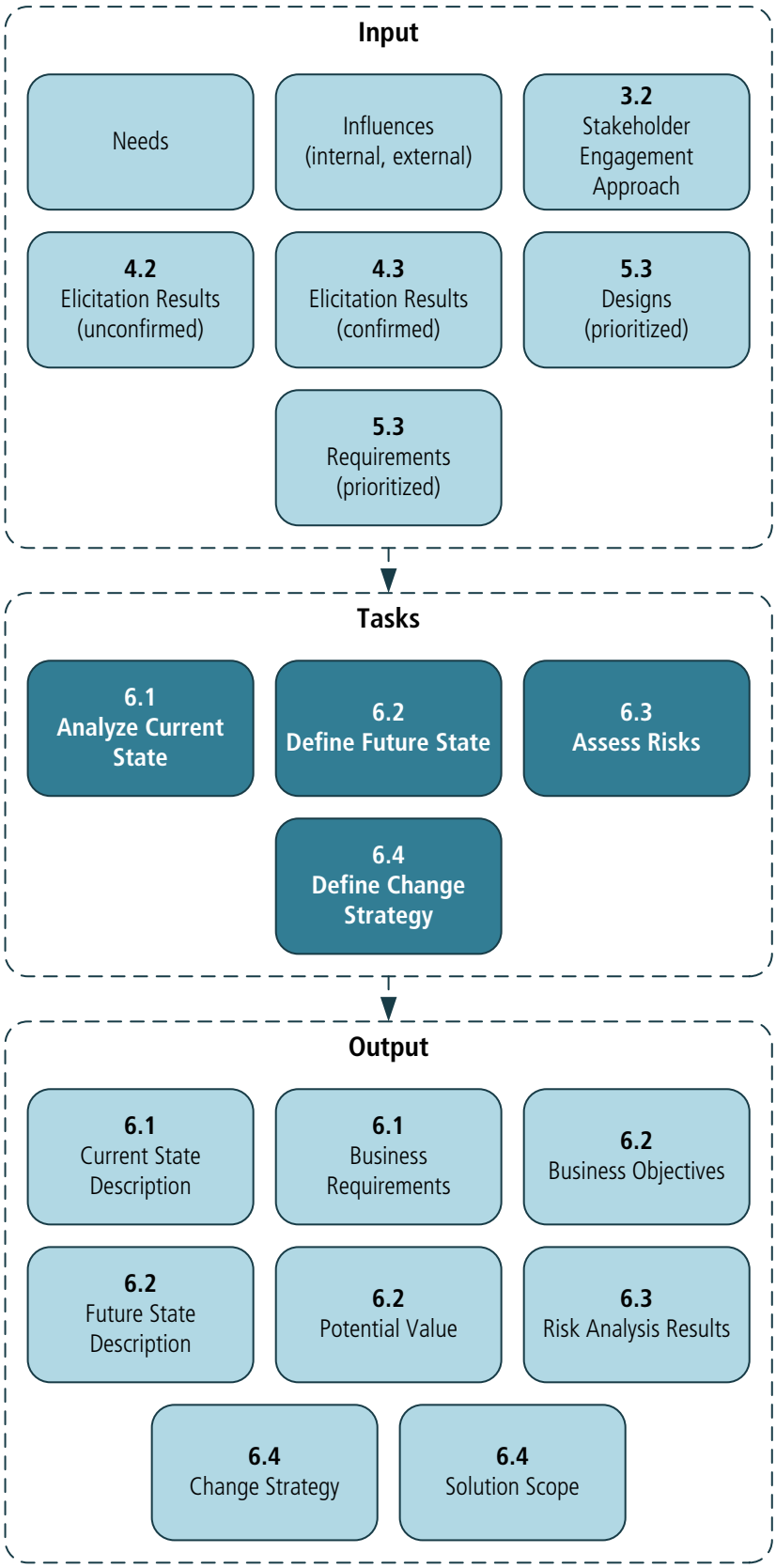
Figure 6.0.1: Strategy Analysis Input/Output Diagram



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6.1 Analyze Current State

6.1.1 Purpose

The purpose of Analyze Current State is to understand the reasons why an enterprise needs to change some aspect of how it operates and what would be directly or indirectly affected by the change.

6.1.2 Description

The starting point for any change is an understanding of *why* the change is needed. Potential change is triggered by problems or opportunities that cannot be addressed without altering the current state. Business analysts work to help stakeholders enable change by exploring and articulating the business needs that drive the desire to change. Without clearly understood business needs, it is impossible to develop a coherent strategy, and the resulting change initiative is almost certain to be driven by a mix of conflicting stakeholder demands.

Change always occurs in a context of existing stakeholders, processes, technology, and policies which constitute the current state of the enterprise. Business analysts examine the current state in the context of the business need to understand what may influence proposed changes, and what will be affected by them. The current state is explored in just enough detail to validate the need for a change and/or the change strategy. Understanding the current state of the enterprise prior to the change is necessary to identify what will need to change to achieve a desired future state and how the effect of the change will be assessed.

The scope of the current state describes the important existing characteristics of the environment. The boundaries of the current state scope are determined by the components of the enterprise and its environment as they relate to the needs. The current state can be described on different levels, ranging from the entire enterprise to small components of a solution. Creating a model of the current state might require collaboration throughout or outside the enterprise. For small efforts, the scope might be only a small component of an enterprise.

The current state of an enterprise is rarely static while a change is being developed and implemented. Internal and external influencers, as well as other organizational changes, can affect the current state in ways that force alterations in the desired future state, change strategy, or requirements and designs.

6.1.3 Inputs

- **Elicitation Results**: used to define and understand the current state.
- **Needs**: the problem or opportunity faced by an enterprise or organization often launches business analysis work to better understand these needs.

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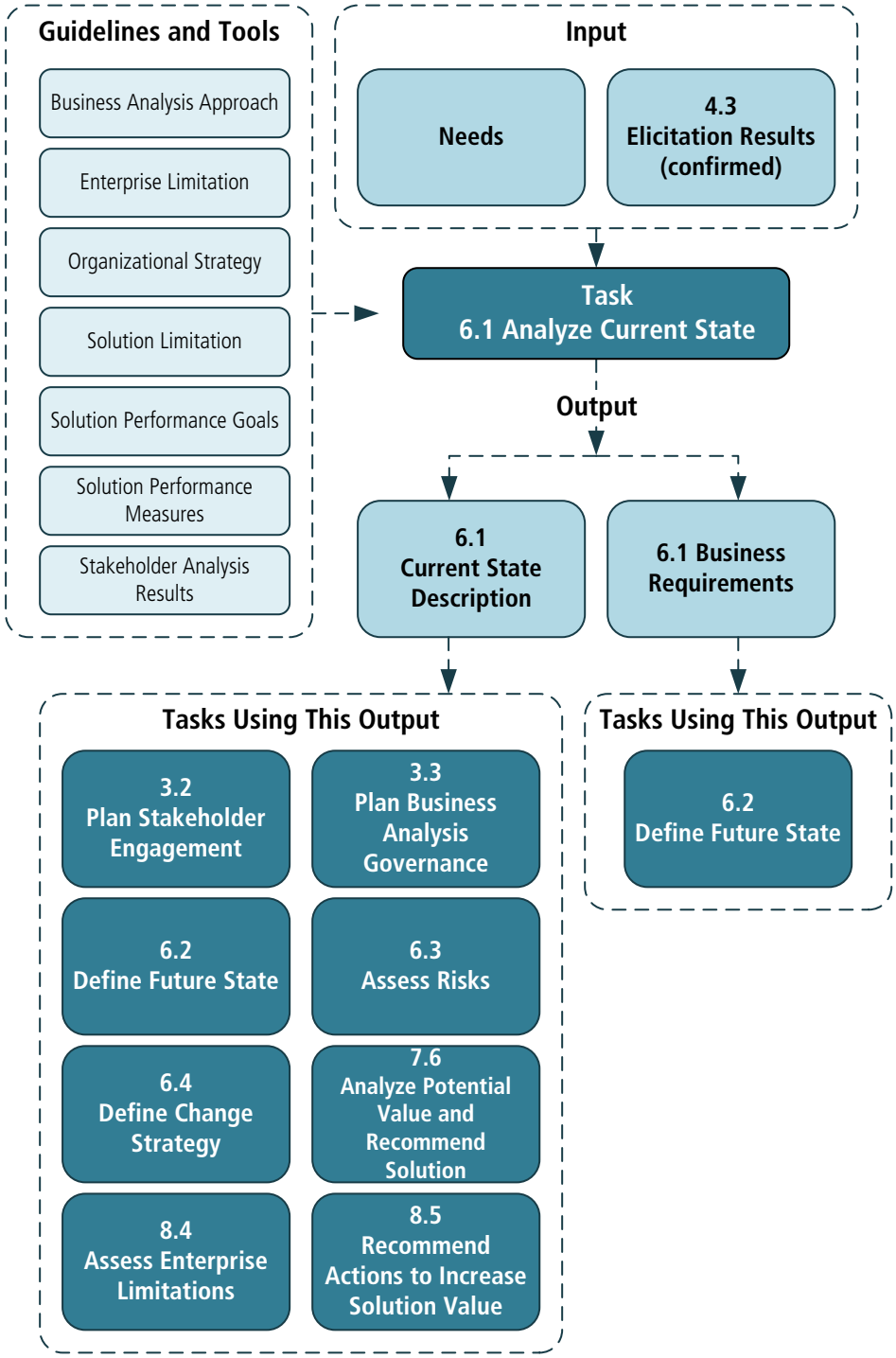
Figure 6.1.1: Analyze Current State Input/Output Diagram



6.1.4 Elements

.1 Business Needs

Business needs are the problems and opportunities of strategic importance faced by the enterprise. An issue encountered in the organization, such as a customer complaint, a loss of revenue, or a new market opportunity, usually triggers the evaluation of a business need.

A business need may be identified at many different levels of the enterprise:

- **From the top-down**: a strategic goal that needs to be achieved.
- **From the bottom-up**: a problem with the current state of a process, function or system.
- **From middle management**: a manager needs additional information to make sound decisions or must perform additional functions to meet business objectives.
- **From external drivers**: customer demand or business competition in the marketplace.

The definition of business needs is frequently the most critical step in any business analysis effort. A solution must satisfy the business needs to be considered successful. The way the need is defined determines which alternative solutions will be considered, which stakeholders will be consulted, and which solution approaches will be evaluated. Business needs are always expressed from the perspective of the enterprise, and not that of any particular stakeholder.

Business needs are often identified or expressed along with a presumed solution. The business analyst should question the assumptions and constraints that are generally buried in the statement of the issue to ensure that the correct problem is being solved and the widest possible range of alternative solutions are considered.

A solution to a set of business needs must have the potential to generate benefits for the enterprise or its stakeholders, or avoid losses that would otherwise occur. Factors the business analyst may consider include:

- adverse impacts the problem is causing within the organization and quantify those impacts (for example, potential lost revenue, inefficiencies, dissatisfied customers, low employee morale),
- expected benefits from any potential solution (for example, increased revenue, reduced costs, increased market share),
- how quickly the problem could potentially be resolved or the opportunity could be taken, and the cost of doing nothing, and
- the underlying source of the problem.

Business needs will drive the overall analysis of the current state. Although it isn't necessary to fully detail all aspects of the current state before further developing the change strategy, this exploration will often uncover deeper underlying causes of the problem or the opportunity that triggered the investigation (which then become additional business needs).

.2 Organizational Structure and Culture

Organizational structure defines the formal relationships between people working in the enterprise. While communication channels and relationships are not limited to that structure, they are heavily influenced by it, and the reporting structure may aid or limit a potential change.

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Organizational culture is the beliefs, values, and norms shared by the members of an organization. These beliefs drive the actions taken by an organization. Business analysts perform a cultural assessment to:

- identify if cultural changes are required to better achieve the goals,
- identify whether stakeholders understand the rationale for the current state of the enterprise and the value delivered by it, and
- ascertain whether the stakeholders view the current state as satisfactory or if change is needed.

.3 Capabilities and Processes

Capabilities and processes describe the activities an enterprise performs. They also include the knowledge the enterprise has, the products and services it provides, the functions it supports, and the methods it uses to make decisions. Core capabilities or processes describe the essential functions of the enterprise that differentiate it from others. They are measured by performance indicators that can be used to assess the benefits of a change.

Business analysts may use:

- A capability-centric view of the enterprise when looking for innovative solutions that combine existing capabilities to produce a new outcome. A capability-based view is useful in this situation because capabilities are generally organized in a functional hierarchy with relationships to other capabilities, making it easier to identify any gaps.
- A process-centric view of the enterprise when looking for ways to improve the performance of current activities. A process-based view is useful in this situation because processes are organized in an end-to-end fashion across the enterprise to deliver value to its customers, making it easier to ensure that a change does in fact increase performance.

.4 Technology and Infrastructure

Information systems used by the enterprise support people in executing processes, making decisions, and in interactions with suppliers and customers. The infrastructure describes the enterprise's environment with respect to physical components and capabilities. The infrastructure can include components such as computer hardware, physical plants, and logistics, as well as their operation and upkeep.

.5 Policies

Policies define the scope of decision making at different levels of an enterprise. They generally address routine operations rather than strategic change. They ensure that decisions are made correctly, provide guidance to staff on permitted and appropriate behaviour and actions, support governance, and determine when and how new resources can be acquired. Identification of relevant policies may shape the scope of the solution space and may be a constraint on the types

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of action that can be pursued.

.6 Business Architecture

No part of the current state should be assessed in complete isolation from the rest. Business analysts must understand how all of these elements of the current state fit together and support one another in order to recommend changes that will be effective. The existing business architecture typically meets an assortment of business and stakeholder needs. If those needs are not recognized or do not continue to be met by a proposed transition or future state, changes are likely to result in a loss of value.

.7 Internal Assets

Business analysts identify enterprise assets used in the current state. Resources can be tangible or intangible, such as financial resources, patents, reputation, and brand names.

.8 External Influencers

There are external influences on the enterprise that do not participate in a change but might present constraints, dependencies, or drivers on the current state.

Sources of external influence include:

- **Industry Structure**: individual industries have distinct ways in which value is created within that industry. This is a particularly important influencer if a proposed change involves entering a new industry.
- **Competitors**: the nature and intensity of competitors between enterprises within an industry can be significant. The entry of a new competitor may also change the nature of the industry or increase competition.
- **Customers**: the size and nature of existing and potential customer segments can provide influences such as negotiating power and a degree of price sensitivity. Alternatively, the emergence of new alternative ways that customers can meet their needs may drive the enterprise to deliver greater value.
- **Suppliers**: the variety and diversity of suppliers might be an influencer, as can the power that suppliers have over their customers.
- **Political and Regulatory Environment**: there is often influence from the current and potential impact of laws and regulations upon the industry.
- **Technology**: the productivity enhancing potential of recent and expected technological innovations might influence the need.
- **Macroeconomic Factors**: the constraints and opportunities that exist within the existing and expected macroeconomic environment (for example, trade, unemployment, or inflation) might influence the need.

Some of these sources might use different terminology, based on whether the enterprise is a for-profit corporation, a non-profit enterprise, or a government agency. For example, a country does not have customers; it has citizens.

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6.1.5 Guidelines and Tools

- **Business Analysis Approach**: guides how the business analyst undertakes an analysis of the current state.
- **Enterprise Limitation**: used to understand the challenges that exist within the enterprise.
- **Organizational Strategy**: an organization will have a set of goals and objectives which guides operations, establishes direction, and provides a vision for the future state. This can be implicitly or explicitly stated.
- **Solution Limitation**: used to understand the current state and the challenges of existing solutions.
- **Solution Performance Goals**: measure the current performance of an enterprise or solution, and serve as a baseline for setting future state goals and measuring improvement.
- **Solution Performance Measures**: describe the actual performance of existing solutions.
- **Stakeholder Analysis Results**: stakeholders from across the organization will contribute to an understanding and analysis of the current state.

6.1.6 Techniques

- **Benchmarking and Market Analysis**: provides an understanding of where there are opportunities for improvement in the current state. Specific frameworks that may be useful include 5 Forces analysis, PEST, STEEP, CATWOE, and others.
- **Business Capability Analysis**: identifies gaps and prioritizes them in relation to value and risk.
- **Business Model Canvas**: provides an understanding of the value proposition that the enterprise satisfies for its customers, the critical factors in delivering that value, and the resulting cost and revenue streams. Helpful for understanding the context for any change and identifying the problems and opportunities that may have the most significant impact.
- **Business Cases**: used to capture information regarding the business need and opportunity.
- **Concept Modelling**: used to capture key terms and concepts in the business domain and define the relationships between them.
- **Data Mining**: used to obtain information on the performance of the enterprise.
- **Document Analysis**: analyzes any existing documentation about the current state, including (but not limited to) documents created during the implementation of a solution, training manuals, issue reports, competitor information, supplier agreements, published industry benchmarks, published technology trends, and performance metrics.

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- **Financial Analysis**: used to understand the profitability of the current state and the financial capability to deliver change.
- **Focus Groups**: solicits feedback from customers or end users about the current state.
- **Functional Decomposition**: breaks down complex systems or relationships in the current state.
- **Interviews**: facilitate dialogue with stakeholders to understand the current state and any needs evolving from the current state.
- **Item Tracking**: tracks and manages issues discovered about the current state.
- **Lessons Learned**: enables the assessment of failures and opportunities for improvement in past initiatives, which may drive a business need for process improvement.
- **Metrics and Key Performance Indicators (KPIs)**: assesses performance of the current state of an enterprise.
- **Mind Mapping**: used to explore relevant aspects of the current state and better understand relevant factors affecting the business need.
- **Observation**: may provide opportunities for insights into needs within the current state that have not been identified previously by a stakeholder.
- **Organizational Modelling**: describes the roles, responsibilities, and reporting structures that exist within the current state organization.
- **Process Analysis**: identifies opportunities to improve the current state.
- **Process Modelling**: describes how work occurs within the current solution.
- **Risk Analysis and Management**: identifies risks to the current state.
- **Root Cause Analysis**: provides an understanding of the underlying causes of any problems in the current state in order to further clarify a need.
- **Scope Modelling**: helps define the boundaries on the current state description.
- **Survey or Questionnaire**: helps to gain an understanding of the current state from a large, varied, or disparate group of stakeholders.
- **SWOT Analysis**: evaluates the strengths, weaknesses, opportunities, and threats to the current state enterprise.
- **Vendor Assessment**: determines whether any vendors that are part of the current state are adequately meeting commitments, or if any changes are needed.
- **Workshops**: engage stakeholders to collaboratively describe the current state and their needs.

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6.1.7 Stakeholders

- **Customer**: makes use of the existing solution and might have input about issues with a current solution.
- **Domain Subject Matter Expert**: has expertise in some aspect of the current state.
- **End User**: directly uses a solution and might have input about issues with a current solution.
- **Implementation Subject Matter Expert**: has expertise in some aspect of the current state.
- **Operational Support**: directly involved in supporting the operations of the organization and provides information on their ability to support the operation of an existing solution, as well as any known issues.
- **Project Manager**: may use information on current state as input to planning.
- **Regulator**: can inform interpretations of relevant regulations that apply to the current state in the form of business policies, business rules, procedures, or role responsibilities. The regulator might have unique input to the operational assessment, as there might be new laws and regulations with which to comply.
- **Sponsor**: might have context for performance of existing solutions.
- **Supplier**: might be an external influencer of the current state.
- **Tester**: able to provide information about issues with any existing solutions.

6.1.8 Outputs

- **Current State Description**: the context of the enterprise's scope, capabilities, resources, performance, culture, dependencies, infrastructure, external influences, and significant relationships between these elements.
- **Business Requirements**: the problem, opportunity, or constraint which is defined based on an understanding of the current state.

6.2 Define Future State

6.2.1 Purpose

The purpose of Define Future State is to determine the set of necessary conditions to meet the business need.

6.2.2 Description

All purposeful change must include a definition of success. Business analysts work to ensure that the future state of the enterprise is well defined, that it is achievable with the resources available, and that key stakeholders have a shared

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consensus vision of the outcome. As with current state analysis, the purpose of future state analysis is not to create a comprehensive description of the outcome at a level of detail that will directly support implementation. The future state will be defined at a level of detail that:

- allows for competing strategies to achieve the future state to be identified and assessed,
- provides a clear definition of the outcomes that will satisfy the business needs,
- details the scope of the solution space,
- allows for value associated with the future state to be assessed, and
- enables consensus to be achieved among key stakeholders.

The future state description can include any context about the proposed future state. It describes the new, removed, and modified components of the enterprise. It can include changes to the boundaries of the organization itself, such as entering a new market or performing a merger or acquisition. The future state can also be simple changes to existing components of an organization, such as changing a step in a process or removing a feature from an existing application. Change may be needed to any component of the enterprise, including (but not limited to):

- business processes,
- functions,
- lines of business,
- organization structures,
- staff competencies,
- knowledge and skills,
- training,
- facilities,
- desktop tools,
- organization locations,
- data and information,
- application systems, and/or
- technology infrastructure.

Descriptions may include visual models and text to clearly show the scope boundaries and details. Relevant relationships between entities are identified and described. The effort required to describe the future state varies depending on the nature of the change. The expected outcomes from a change might include specific metrics or loosely defined results. Describing the future state allows stakeholders to understand the potential value that can be realized from a solution, which can be used as part of the decision-making process regarding the change strategy. In environments where changes result in predictable outcomes and predictable delivery of value, and where there are a large number of possible changes that can increase value, the purpose of future state analysis is to gather sufficient information to make the best possible choices among potential options. In cases where it is difficult to predict the value realized by a change, the future state may be defined by identification of appropriate performance measures (to produce an agreed-upon set of measures for business value), and the change strategy will support exploration of multiple options.

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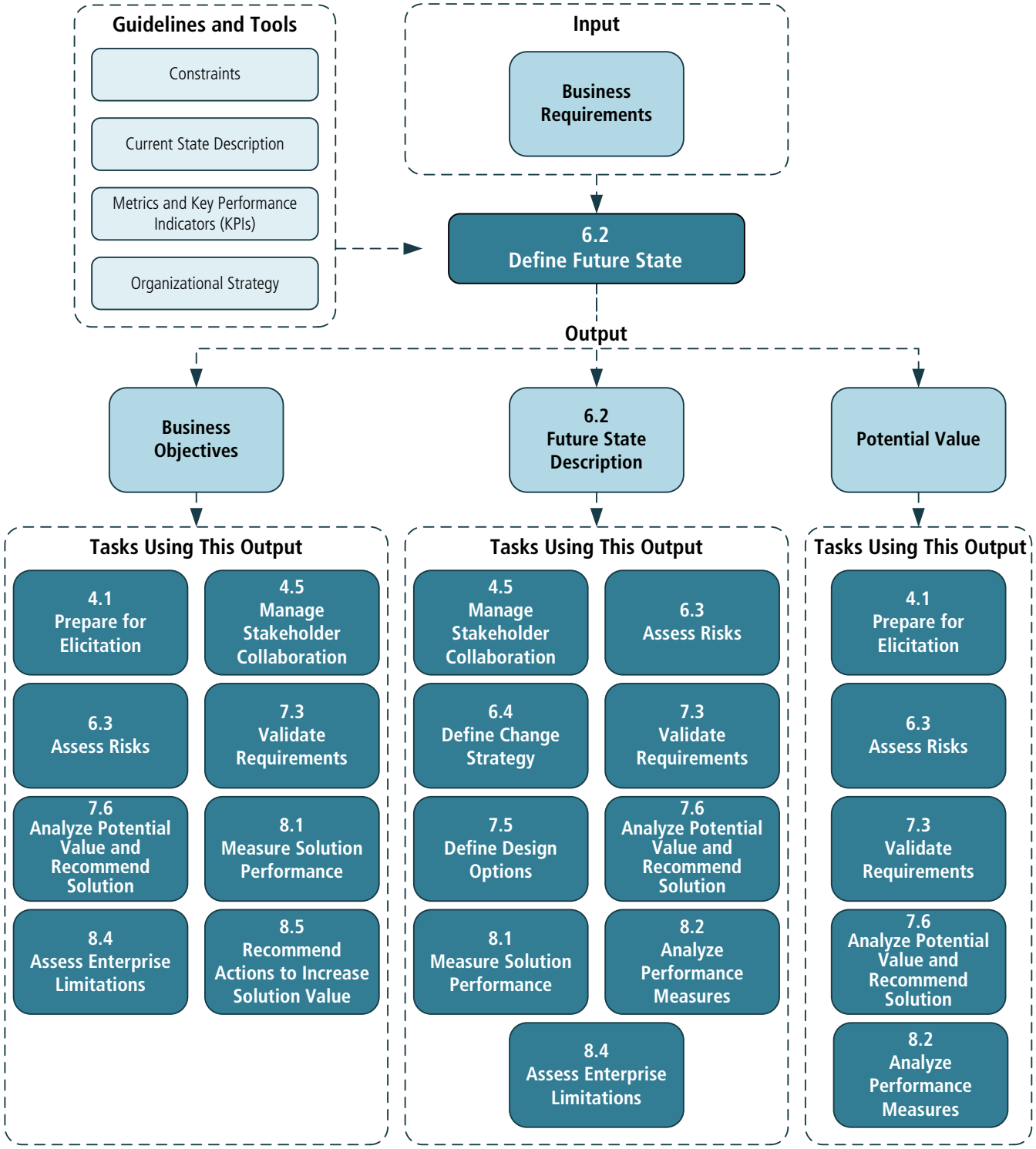
6.2.3 Inputs

- **Business Requirements**: the problems, opportunities, or constraints that the future state will address.

Figure 6.2.1: Define Future State Input/Output Diagram



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6.2.4 Elements

.1 Business Goals and Objectives

A future state can be described in terms of business objectives or goals in order to guide the development of the change strategy and identify potential value. Business goals and objectives describe the ends that the organization is seeking to achieve. Goals and objectives can relate to changes that the organization wants to accomplish, or current conditions that it wants to maintain.

Goals are longer term, ongoing, and qualitative statements of a state or condition that the organization is seeking to establish and maintain. Examples of business goals include:

- Create a new capability such as a new product or service, address a competitive disadvantage, or create a new competitive advantage.
- Improve revenue by increasing sales or reducing cost.
- Increase customer satisfaction.
- Increase employee satisfaction.
- Comply with new regulations.
- Improve safety.
- Reduce time to deliver a product or service.

High-level goals can be decomposed to break down the general strategy into areas that may lead to desired results, such as increased customer satisfaction, operational excellence, and/or business growth. For example, a goal may be to "increase number of high-revenue customers" and then be further refined into a goal to "increase number of high revenue customers in the 30-45 age bracket by 30% within 6 months".

As goals are analyzed they are converted into more descriptive, granular and specific objectives, and linked to measures that make it possible to objectively assess if the objective has been achieved. Objectives that are measurable enable teams to know if needs were addressed and whether a change was effective. Defining measurable objectives is often critical to justify completing the change and might be a key component to a business case for the change. A common test for assessing objectives is to ensure that they are SMART:

- **S**pecific: describing something that has an observable outcome,
- **M**easurable: tracking and measuring the outcome,
- **A**chievable: testing the feasibility of the effort,
- **R**elevant: aligning with the enterprise's vision, mission, and goals, and
- **T**ime-bounded: defining a time frame that is consistent with the need.

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.2 Scope of Solution Space

Decisions must be made about the range of solutions that will be considered to meet the business goals and objectives. The scope of the solution space defines which kinds of options will be considered when investigating possible solutions, including changes to the organizational structure or culture, capabilities and processes, technology and infrastructure, policies, products, or services, or even creating or changing relationships with organizations currently outside the scope of the extended enterprise. Solutions in each of these areas generally require specific expertise from both the business analysis and the delivery team. The analysis for this might happen on different levels in the enterprise, and the scope of the solution space is not necessarily related to the size of the change. Even a small change might require looking at the enterprise-level business objectives to ensure alignment.

If multiple future states can meet the business needs, goals and objectives, it will be necessary to determine which ones will be considered. This decision is typically based on the value to be delivered to stakeholders and requires an understanding of possible change strategies. The critical considerations for the decision are dependent on the overall objectives of the enterprise, but will involve an understanding of the quantitative and qualitative value of each option, the time needed to achieve each future state, and the opportunity cost to the enterprise.

.3 Constraints

Constraints describe aspects of the current state, aspects of the planned future state that may not be changed by the solution, or mandatory elements of the design. They must be carefully examined to ensure that they are accurate and justified.

Constraints may reflect any of the following:

- budgetary restrictions,
- time restrictions,
- technology,
- infrastructure,
- policies,
- limits on the number of resources available,
- restrictions based on the skills of the team and stakeholders,
- a requirement that certain stakeholders not be affected by the implementation of the solution,
- compliance with regulations, and
- any other restriction.

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.4 Organizational Structure and Culture

The formal and informal working relationships that exist within the enterprise may need to change to facilitate the desired future state. Changes to reporting lines can encourage teams to work more closely together and facilitate alignment of goals and objectives. Elements of the organizational structure and culture may need to change to support the future state. Describing the components of the future state provides insight into potential conflicts, impact, and limits.

.5 Capabilities and Processes

Identify new kinds of activities or changes in the way activities will be performed to realize the future state. New or changed capabilities and processes will be needed to deliver new products or services, to comply with new regulations, or to improve the performance of the enterprise.

.6 Technology and Infrastructure

If current technology and infrastructure are insufficient to meet the business need, the business analyst identifies the changes necessary for the desired future state.

The existing technology may impose technical constraints on the design of the solution. These may include development languages, hardware and software platforms, and application software that must be used. Technical constraints may also describe restrictions such as resource utilization, message size and timing, software size, maximum number of and size of files, records, and data elements. Technical constraints include any IT architecture standards that must be followed.

.7 Policies

If current polices are insufficient to meet the business need, the business analyst identifies the changes necessary for the desired future state.

Policies are a common source of constraints on a solution or on the solution space. Business policies may mandate what solutions can be implemented given certain levels of approval, the process for obtaining approval, and the necessary criteria a proposed solution must meet in order to receive funding. In some instances, a change to an existing policy may open up alternative solutions that would not otherwise be considered.

.8 Business Architecture

The elements of any future state must effectively support one another and all contribute to meeting the business goals and objectives. In addition, they should be integrated into the overall desired future state of the enterprise as a whole, and support *that* future state.

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.9 Internal Assets

The analysis of resources might indicate that existing resources need to be increased or require increased capabilities, or that new resources need to be developed. When analyzing resources, business analysts examine the resources needed to maintain the current state and implement the change strategy, and determine what resources can be used as part of a desired future state. The assessment of existing and needed resources is considered when performing a feasibility analysis on possible solution approaches for the change strategy.

.10 Identify Assumptions

Most strategies are predicated on a set of assumptions that will determine whether or not the strategy can succeed, particularly when operating in a highly uncertain environment. It will often be difficult or impossible to prove that the delivery of a new capability will meet a business need, even in cases where it appears reasonable to assume that the new capability will have the desired effect. These assumptions must be identified and clearly understood, so that appropriate decisions can be made if the assumption later proves invalid. Change strategies in uncertain environments can be structured in order to test these assumptions as early as possible to support a redirection or termination of the initiative.

.11 Potential Value

Meeting the business objectives alone does not justify the transition to a future state; the potential value must be evaluated to see if it is sufficient to justify a change.

When defining the future state, business analysts identify the potential value of the solution. The potential value of the future state is the net benefit of the solution after operating costs are accounted for. A change must result in greater value for the enterprise than would be achieved if no action was taken. However, it is possible that the future state will represent a decrease in value from the current state for some stakeholders or even for the enterprise as a whole. New regulations or increased competition, for example, might need to be addressed for the enterprise to remain operating but could still decrease the overall value captured.

While determining the future state, business analysts consider increased or decreased potential value from:

- external opportunities revealed in assessing external influences,
- unknown strengths of new partners,
- new technologies or knowledge,
- potential loss of a competitor in the market, and
- mandated adoption of a change component.

Business analysts identify the specific opportunities for potential alterations in value, as well as the probability of those increases for the individual components

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of the proposed change. Business analysts estimate a total potential value by aggregating across all opportunities.

The potential value, including the details of the expected benefit and costs and the likely result if no change is made, is a key component to making a business case for the change. Relating descriptions of potential value to measures of actual value currently being achieved enables stakeholders to understand the expected change in value. In most cases, the future state will not address all of the opportunities for improvement. Any unaddressed opportunities might remain valid after the solution is implemented and should be noted for future analysis in other changes.

In addition to the potential value of the future state, this analysis should consider the acceptable level of investment to reach the future state. While the actual investment will depend on the change strategy, this information guides the selection of possible strategies.

6.2.5 Guidelines and Tools

- **Current State Description**: provides the context within which the work needs to be completed. It is often used as a starting point for the future state.
- **Metrics and Key Performance Indicators (KPIs)**: the key performance indicators and metrics which will be used to determine whether the desired future state has been achieved.
- **Organizational Strategy**: describes the path, method, or approach an enterprise or organization will take to achieve its desired future state. This can be implicitly or explicitly stated.

6.2.6 Techniques

- **Acceptance and Evaluation Criteria**: used to identify what may make the future state acceptable and/or how options may be evaluated.
- **Balanced Scorecard**: used to set targets for measuring the future state.
- **Benchmarking and Market Analysis**: used to make decisions about future state business objectives.
- **Brainstorming**: used to collaboratively come up with ideas for the future state.
- **Business Capability Analysis**: used to prioritize capability gaps in relation to value and risk.
- **Business Cases**: used to capture the desired outcomes of the change initiative.
- **Business Model Canvas**: used to plan strategy for the enterprise by mapping out the needed infrastructure, target customer base, financial cost structure, and revenue streams required to fulfill the value proposition to customers in the desired future state.
- **Decision Analysis**: used to compare the different future state options and understand which is the best choice.

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- **Decision Modelling**: used to model complex decisions regarding future state options.
- **Financial Analysis**: used to estimate the potential financial returns to be delivered by a proposed future state.
- **Functional Decomposition**: used to break down complex systems within the future state for better understanding.
- **Interviews**: used to talk to stakeholders to understand their desired future state, which needs they want to address, and what desired business objectives they want to meet.
- **Lessons Learned**: used to determine which opportunities for improvement will be addressed and how the current state can be improved upon.
- **Metrics and Key Performance Indicators (KPIs)**: used to determine when the organization has succeeded in achieving the business objectives.
- **Mind Mapping**: used to develop ideas for the future state and understand relationships between them.
- **Organizational Modelling**: used to describe the roles, responsibilities, and reporting structures that would exist within the future state organization.
- **Process Modelling**: used to describe how work would occur in the future state.
- **Prototyping**: used to model future state options and could also help determine potential value.
- **Scope Modelling**: used to define the boundaries of the enterprise in the future state.
- **Survey or Questionnaire**: used to understand stakeholders' desired future state, which needs they want to address, and what desired business objectives they want to meet.
- **SWOT Analysis**: used to evaluate the strengths, weaknesses, opportunities, and threats that may be exploited or mitigated by the future state.
- **Vendor Assessment**: used to assess potential value provided by vendor solution options.
- **Workshops**: used to work with stakeholders to collaboratively describe the future state.

6.2.7 Stakeholders

- **Customer**: might be targeted purchasers or consumers in a future state who might or might not be ready or able to consume a new state.
- **Domain Subject Matter Expert**: provides insight into current state and potential future states.
- **End User**: expected to use, or be a component of, a solution that implements the future state.

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- **Implementation Subject Matter Expert**: provides information regarding the feasibility of achieving the future state.
- **Operational Support**: directly involved in supporting the operations of the enterprise and provides information on their ability to support the operation of a proposed future state.
- **Project Manager**: might have input on what is a reasonable and manageable desired future state.
- **Regulator**: ensures that laws, regulations, or rules are adhered to in the desired future state. Interpretations of relevant regulations must be included in the future state description in the form of business policies, business rules, procedures, or role responsibilities.
- **Sponsor**: helps determine which business needs to address and sets the business objectives that a future state will achieve. Authorizes and ensures funding to support moving towards the future state.
- **Supplier**: might help define the future state if they are supporting delivery of the change or deliver any part of the future state operation.
- **Tester**: responsible for ensuring an envisioned future state can be sufficiently tested and can help set an appropriate level of quality to target.

6.2.8 Outputs

- **Business Objectives**: the desired direction that the business wishes to pursue in order to achieve the future state.
- **Future State Description**: the future state description includes boundaries of the proposed new, removed, and modified components of the enterprise and the potential value expected from the future state. The description might include the desired future capabilities, policies, resources, dependencies, infrastructure, external influences, and relationships between each element.
- **Potential Value**: the value that may be realized by implementing the proposed future state.

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6.3 Assess Risks

6.3.1 Purpose

The purpose of Assess Risks is to understand the undesirable consequences of internal and external forces on the enterprise during a transition to, or once in, the future state. An understanding of the potential impact of those forces can be used to make a recommendation about a course of action.

6.3.2 Description

Assessing risks includes analyzing and managing them. Risks might be related to the current state, a desired future state, a change itself, a change strategy, or any tasks being performed by the enterprise.

The risks are analyzed for the:

- possible consequences if the risk occurs,
- impact of those consequences,
- likelihood of the risk, and
- potential time frame when the risk might occur.

The collection of risks is used as an input for selecting or coordinating a change strategy. A risk assessment can include choosing to accept a risk if either the effort required to modify the risk or the level of risk outweighs the probable loss. If the risks are understood and the change proceeds, then the risks can be managed to minimize their overall impact to value.

Important A number of methods include 'positive risk' as a way of managing opportunities. Although the formal definition of risk in the *BABOK® Guide* doesn't preclude this usage, 'opportunities' are captured as needs (and managed accordingly), and risk is used for uncertain events that can produce negative outcomes.

6.3.3 Inputs

- **Business Objectives**: describing the desired direction needed to achieve the future state can be used to identify and discuss potential risks.
- **Elicitation Results (confirmed)**: an understanding of what the various stakeholders perceive as risks to the realization of the desired future state.
- **Influences**: factors inside of the enterprise (internal) and factors outside of the enterprise (external) which will impact the realization of the desired future state.
- **Potential Value**: describing the value to be realized by implementing the proposed future state provides a benchmark against which risks can be assessed.
- **Requirements (prioritized)**: depending on their priority, requirements will influence the risks to be defined and understood as part of solution realization.

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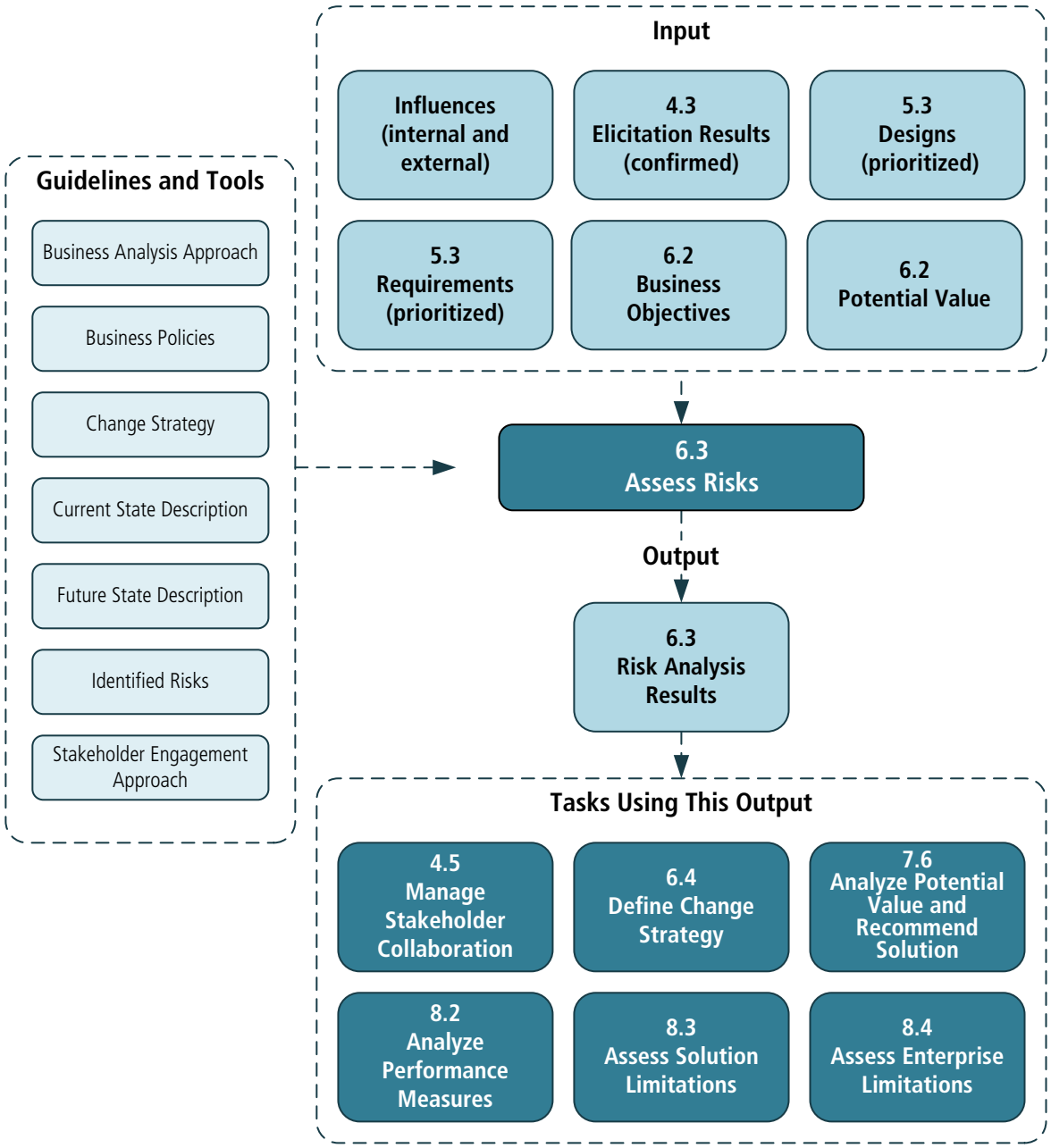
Figure 6.3.1: Assess Risks Input/Output Diagram



6.3.4 Elements

.1 Unknowns

When assessing a risk, there will be uncertainty in the likelihood of it occurring, and the impact if it does occur. Business analysts collaborate with stakeholders to assess risks based on current understanding. Even when it is not possible to know all that will occur as a result of a particular change strategy, it is still possible to estimate the impact of unknown or uncertain events or conditions occurring. Business analysts consider other historical contexts from similar situations to assess risks. The lessons learned from past changes and expert judgment from

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stakeholders assist business analysts in guiding the team in deciding the impact and likelihood of risks for the current change.

.2 Constraints, Assumptions, and Dependencies

Constraints, assumptions, and dependencies can be analyzed for risks and sometimes should be managed as risks themselves. If the constraint, assumption, or dependency is related to an aspect of a change, it can be restated as a risk by identifying the event or condition and consequences that could occur because of the constraint, assumption, or dependency.

.3 Negative Impact to Value

Risks are expressed as conditions that increase the likelihood or severity of a negative impact to value. Business analysts clearly identify and express each risk and estimate its likelihood and impact to determine the level of risk. Business analysts estimate a total risk level from the aggregated set of risks, indicating the overall potential impact for the risks being assessed. In some cases overall risk level can be quantified in financial terms, or in an amount of time, effort, or other measures.

.4 Risk Tolerance

How much uncertainty a stakeholder or an enterprise is willing to take on in exchange for potential value is referred to as risk tolerance.

In general, there are three broad ways of describing attitude toward risk:

- **Risk-aversion**: An unwillingness to accept much uncertainty; there may be a preference to either avoid a course of action which carries too high a level of risk, or to invest more (and therefore accept a lower potential value) to reduce the risks.
- **Neutrality**: some level of risk is acceptable, provided the course of action does not result in a loss even if the risks occur.
- **Risk-seeking**: A willingness to accept or even take on more risk in return for a higher potential value.

An individual or organization may exhibit different risk tolerances at different times. If there is low tolerance for risk, there may be more effort on avoidance, transfer or mitigation strategies. If the tolerance for risk is high, more risks are likely to be accepted. Typically, the highest level risks are dealt with no matter what the risk tolerance level.

.5 Recommendation

Based on the analysis of risks, business analysts recommend a course of action. Business analysts work with stakeholders to understand the overall risk level and their tolerance for risk.

The recommendation usually falls into one of the following categories:

- pursue the benefits of a change regardless of the risk,

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- pursue the benefits of a change while investing in reducing risk (likelihood and/or impact),
- seek out ways to increase the benefits of a change to outweigh the risk,
- identify ways to manage and optimize opportunities, and
- do not pursue the benefits of a change.

If the change proceeds with risks, stakeholders should be identified to monitor the risks and consequences if the risk event occurs. The risk may alter the current state of the enterprise and require revision of the change strategy. A plan of action in this case may be developed before the risk materializes.

6.3.5 Guidelines and Tools

- **Business Analysis Approach**: guides how the business analyst analyzes risks.
- **Business Policies**: define the limits within which decisions must be made. These may mandate or govern aspects of risk management.
- **Change Strategy**: provides the plan to transition from the current state to the future state and achieve the desired business outcomes. This approach must be assessed to understand risks associated with the change.
- **Current State Description**: provides the context within which the work needs to be completed. It can be used to determine risks associated with the current state.
- **Future State Description**: determines risks associated with the future state.
- **Identified Risks**: can be used as a starting point for more thorough risk assessment. These can come from Risk Analysis Results, from elicitation activities, from previous business analysis experience, or based on expert opinion.
- **Stakeholder Engagement Approach**: understanding stakeholders and stakeholder groups helps identify and assess the potential impact of internal and external forces.

6.3.6 Techniques

- **Brainstorming**: used to collaboratively identify potential risks for assessment.
- **Business Cases**: used to capture risks associated with alternative change strategies.
- **Decision Analysis**: used to assess problems.
- **Document Analysis**: used to analyze existing documents for potential risks, constraints, assumptions, and dependencies.
- **Financial Analysis**: used to understand the potential effect of risks on the financial value of the solution.
- **Interviews**: used to understand what stakeholders think might be risks and the various factors of those risks.
- **Lessons Learned**: used as a foundation of past issues that might be risks.

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- **Mind Mapping**: used to identify and categorize potential risks and understand their relationships.
- **Risk Analysis and Management**: used to identify and manage risks.
- **Root Cause Analysis**: used to identify and address the underlying problem creating a risk.
- **Survey or Questionnaire**: used to understand what stakeholders think might be risks and the various factors of those risks.
- **Workshops**: used to understand what stakeholders think might be risks and the various factors of those risks.

6.3.7 Stakeholders

- **Domain Subject Matter Expert**: provides input to the risk assessment based on their knowledge of preparation required in their area of expertise.
- **Implementation Subject Matter Expert**: provides input to the risk assessment based on their knowledge of preparation required in their area of expertise.
- **Operational Support**: supports the operations of the enterprise and can identify likely risks and their impact.
- **Project Manager**: helps to assess risk and is primarily responsible for managing and mitigating risk to the project.
- **Regulator**: identifies any risks associated with adherence to laws, regulations, or rules.
- **Sponsor**: needs to understand risks as part of authorizing and funding change.
- **Supplier**: there might be risk associated with using a supplier.
- **Tester**: identifies risks in the change strategy, from a validation or verification perspective.

6.3.8 Outputs

Risk Analysis Results: an understanding of the risks associated with achieving the future state, and the mitigation strategies which will be used to prevent those risks, reduce the impact of the risk, or reduce the likelihood of the risk occurring.

6.4 Define Change Strategy

6.4.1 Purpose

The purpose of Define Change Strategy is to develop and assess alternative approaches to the change, and then select the recommended approach.

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6.4.2 Description

Developing a change strategy is simpler when the current state and the future state are already defined because they provide some context for the change.

The change strategy clearly describes the nature of the change in terms of:

- context of the change,
- identified alternative change strategies,
- justification for why a particular change strategy is the best approach,
- investment and resources required to work toward the future state,
- how the enterprise will realize value after the solution is delivered,
- key stakeholders in the change, and
- transition states along the way.

The appropriate representation of a change strategy depends on the perspective of the change team and their stakeholders. The change strategy might be presented as part of a business case, Statement of Work (SOW), an enterprise's strategic plan, or in other formats.

Defining a change strategy usually involves identifying several strategies and ultimately selecting the strategy that is most appropriate for the situation. Change strategies can entail attaining only parts of a future state initially, and therefore include only some components of a complete solution. For each transition state along the path to reaching the future state, the change strategy should clarify which parts of the solution are completed and which are not, as well as which parts of the value can be realized and which cannot.

6.4.3 Inputs

- **Current State Description**: provides context about the current state, and includes assessments of internal and external influences to the enterprise under consideration.
- **Future State Description**: provides context about the desired future state.
- **Risk Analysis Results**: describe identified risks and exposure of each risk.
- **Stakeholder Engagement Approach**: understanding stakeholders' communication and collaboration needs can help identify change-related activities that need to be included as part of the change strategy.

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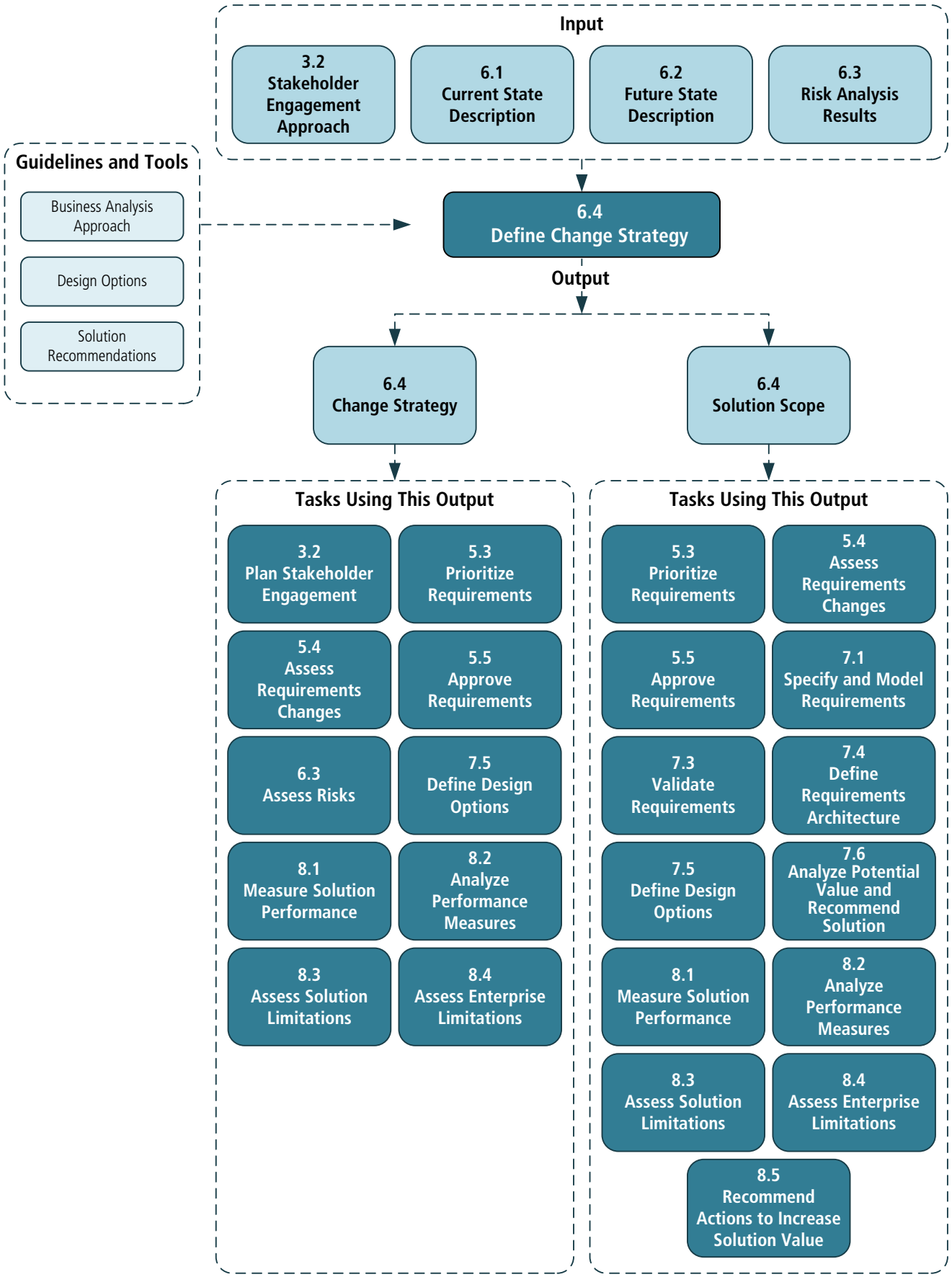
Figure 6.4.1: Define Change Strategy Input/Output Diagram



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6.4.4 Elements

.1 Solution Scope

The solution is the outcome of a change that allows an enterprise to satisfy a need. Multiple solution options might be evaluated and, as part of a change strategy, the best solution approach is justified and selected. The solution scope defines the boundaries of the solution, and is described in enough detail to enable stakeholders to understand which new capabilities the change will deliver. It also describes how the proposed solution enables the future state's goals. The solution scope might evolve throughout an initiative as more information is discovered.

The solution scope might be described in different ways, including the use of:

- capabilities,
- technology,
- business rules,
- business decisions,
- data,
- processes,
- resources,
- knowledge and skills,
- models and descriptions of markets,
- functions,
- locations,
- networks,
- organizational structures,
- workflows,
- events,
- sequence,
- motivations, or
- business logic.

The solution scope can also include descriptions of out-of-scope solution components to provide clarity.

.2 Gap Analysis

A gap analysis identifies the difference between current state and future state capabilities. To perform gap analysis, both current state and future state should be defined. Using the same techniques to describe both current and future states assists in gap analysis, as it simplifies the comparison.

Gap analysis can help identify the gaps that prevent the enterprise from meeting needs and achieving goals. It can be used to determine if the enterprise can meet its needs using its existing structure, resources, capabilities, and technology. If the enterprise can meet the need with the current state capabilities, then the change will likely be relatively small, or there may be no change at all. In any other case, a change strategy is needed to create the missing capabilities or improve the existing ones. The capabilities analyzed in a gap analysis can include:

- processes,
- functions,
- lines of business,
- organizational structures,
- staff competencies,
- knowledge and skills,
- training,
- facilities,

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- locations,
- data and information,
- application systems, and
- technology infrastructure.

The gaps will need to be addressed in the transition and future states.

.3 Enterprise Readiness Assessment

Business analysts analyze the enterprise to assess its capacity to make the change and to sustain the change in the future state. The readiness assessment considers the enterprise's capacity not only to make the change, but to use and sustain the solution, and realize value from the solution. The assessment also factors in the cultural readiness of the stakeholders and operational readiness in making the change, the timeline from when the change is implemented to when value can be realized, and the resources available to support the change effort.

.4 Change Strategy

A change strategy is a high-level plan of key activities and events that will be used to transform the enterprise from the current state to the future state. Change strategies may be a singular initiative composed of smaller changes which might be structured as a set or sequence of projects, or as various continuous improvement efforts. Each element of change might not completely address the need, so multiple changes might be necessary.

During the course of the development of a change strategy, several options are identified, explored, and described in enough detail to determine which options are feasible. Alternatives can be identified through brainstorming and consulting subject matter experts (SMEs). Sources of ideas can include historical ideas, historical changes, other markets' strategies, and competitors' approaches.

A preferred change strategy is selected from this set of options and developed in more detail. The preferred change strategy should be selected considering:

- organizational readiness to make the change,
- major costs and investments needed to make the change,
- timelines to make the change,
- alignment to the business objectives,
- timelines for value realization, and
- opportunity costs of the change strategy.

Business analysts may develop a business case for each potential change strategy to support decision making. The opportunity cost of each change strategy also needs to be considered. Opportunity cost refers to the benefits that could have been achieved by selecting an alternative change strategy. The options considered and rejected are an important component of the final strategy, providing stakeholders with an understanding of the pros and cons of various approaches to making the change.

When defining the change strategy, the investment to make the change to the future state is also considered. The net benefits of a future state may be very high,

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but if the investment is unbearable ("they just can't afford the change") the enterprise may pass on the opportunity, and invest in something else.

The potential value, including the details of the expected benefit and costs, are key components to making a business case for the change. Relating descriptions of potential value to measures of actual value currently being achieved enables stakeholders to understand the expected change in value. While every change facilitated by business analysts is intended to increase value, some changes decrease value in parts of an enterprise while increasing it in others.

.5 Transition States and Release Planning

In many cases, the future state will need to be achieved over time rather than through a single change, meaning that the enterprise will have to operate in one or more transition states. Release planning is concerned with determining which requirements to include in each release, phase, or iteration of the change. Business analysts help facilitate release planning discussions to help stakeholders reach decisions. There are many factors that guide these decisions, such as the overall budget, deadlines or time constraints, resource constraints, training schedules, and the ability of the business to absorb changes within a defined time frame. There may be organizational restraints or policies that must be adhered to in any implementation. Business analysts assist in planning the timing of the implementation in order to cause minimal disruption to business activities, and to ensure all parties understand the impact to the organization.

6.4.5 Guidelines and Tools

- **Business Analysis Approach**: guides how the business analyst defines a change strategy.
- **Design Options**: describe various ways to satisfy the business needs. Each option will come with its own set of change challenges and the change strategy will be impacted by the option selected as well as the specific change approach that will be used.
- **Solution Recommendations**: identifying the possible solutions which can be pursued in order to achieve the future state, which includes the recommendations of various subject matter experts (SMEs), helps the business analyst determine the types of changes to the organization.

6.4.6 Techniques

- **Balanced Scorecard**: used to define the metrics that will be used to evaluate the effectiveness of the change strategy.
- **Benchmarking and Market Analysis**: used to make decisions about which change strategy is appropriate.
- **Brainstorming**: used to collaboratively come up with ideas for change strategies.
- **Business Capability Analysis**: used to prioritize capability gaps in relation to value and risk.

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- **Business Cases**: used to capture information about the recommended change strategy and other potential strategies that were assessed but not recommended.
- **Business Model Canvas**: used to define the changes needed in the current infrastructure, customer base, and financial structure of the organization in order to achieve the potential value.
- **Decision Analysis**: used to compare different change strategies and choose which is most appropriate.
- **Estimation**: used to determine timelines for activities within the change strategy.
- **Financial Analysis**: used to understand the potential value associated with a change strategy, and evaluate strategies against targets set for return on investments.
- **Focus Groups**: used to bring customers or end users together to solicit their input on the solution and change strategy.
- **Functional Decomposition**: used to break down the components of the solution into parts when developing a change strategy.
- **Interviews**: used to talk to stakeholders in order to fully describe the solution scope and change scope, and to understand their suggestions for a change strategy.
- **Lessons Learned**: used to understand what went wrong in past changes in order to improve this change strategy.
- **Mind Mapping**: used to develop and explore ideas for change strategies.
- **Organizational Modelling**: used to describe the roles, responsibilities, and reporting structures that are necessary during the change and are part of the solution scope.
- **Process Modelling**: used to describe how work would occur in the solution scope or during the change.
- **Scope Modelling**: used to define the boundaries on the solution scope and change scope descriptions.
- **SWOT Analysis**: used to make decisions about which change strategy is appropriate.
- **Vendor Assessment**: used to determine whether any vendors are part of the change strategy, either to implement the change or to be part of the solution.
- **Workshops**: used in work with stakeholders to collaboratively develop change strategies.

6.4.7 Stakeholders

- **Customer**: might be purchasing or consuming the solution that results from the change. Customers can also be involved in a change as testers or focus

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group members, whose input is considered in the enterprise readiness assessment.

- **Domain Subject Matter Expert**: have expertise in some aspect of the change.
- **End User**: uses a solution, is a component of the solution, or is a user temporarily during the change. End users could be customers or people who work within the enterprise experiencing a change. Users might be involved in a change as testers or focus group members, whose input is considered in the enterprise readiness assessment.
- **Implementation Subject Matter Expert**: have expertise in some aspect of the change.
- **Operational Support**: directly involved in supporting the operations of the enterprise, and provide information on their ability to support the operation of a solution during and after a change.
- **Project Manager**: responsible for managing change and planning the detailed activities to complete a change. In a project, the project manager is responsible for the project scope, which covers all the work to be performed by the project team.
- **Regulator**: ensures adherence to laws, regulations, or rules during and at the completion of the change. The regulator might have unique input to the enterprise readiness assessment, as there might be laws and regulations that must be complied with prior to or as a result of a planned or completed change.
- **Sponsor**: authorizes and ensures funding for solution delivery, and champions the change.
- **Supplier**: might help implement the change or be part of the solution once the change is completed.
- **Tester**: responsible for ensuring that the change will function within acceptable parameters, accomplish the desired result, and deliver solutions that meet an appropriate level of quality. The tester is often involved in validation of components of a solution for which the results will be included in an enterprise readiness assessment.

6.4.8 Outputs

- **Change Strategy**: the approach that the organization will follow to guide change.
- **Solution Scope**: the solution scope that will be achieved through execution of the change strategy.

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7 Requirements Analysis and Design Definition

The Requirements Analysis and Design Definition knowledge area describes the tasks that business analysts perform to structure and organize requirements discovered during elicitation activities, specify and model requirements and designs, validate and verify information, identify solution options that meet business needs, and estimate the potential value that could be realized for each solution option. This knowledge area covers the incremental and iterative activities ranging from the initial concept and exploration of the need through the transformation of those needs into a particular recommended solution.

Both requirements and designs are important tools used by business analysts to define and guide change. The main difference between requirements and designs is in how they are used and by whom. One person's designs may be another person's requirements. Requirements and designs may be either high-level or very detailed based upon what is appropriate to those consuming the information.

The business analyst's role in modelling needs, requirements, designs, and solutions is instrumental in conducting thorough analysis and communicating with other stakeholders. The form, level of detail, and what is being modelled are all dependent on the context, audience, and purpose.

Business analysts analyze the potential value of both requirements and designs. In collaboration with implementation subject matter experts, business analysts define solution options that can be evaluated in order to recommend the best solution option that meets the need and brings the most value.

The following image illustrates the spectrum of value as business analysis activities progress from delivering potential value to actual value.

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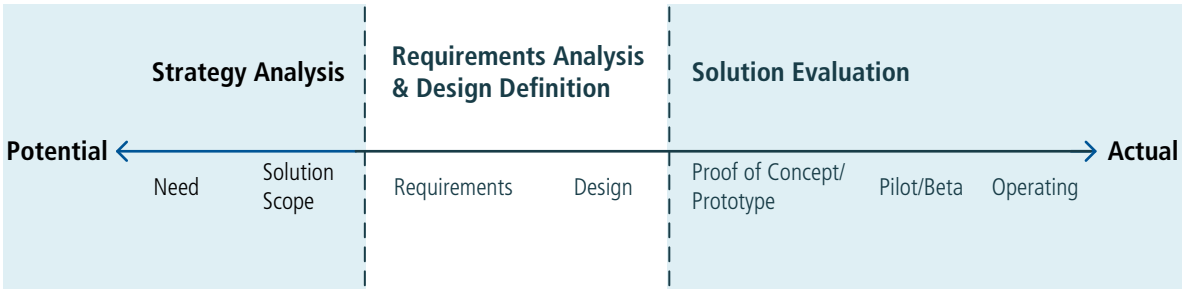
Figure 7.0.1: Business Analysis Value Spectrum



The Requirements Analysis and Design Definition knowledge area includes the following tasks:

- **Specify and Model Requirements**: describes a set of requirements or designs in detail using analytical techniques.
- **Verify Requirements**: ensures that a set of requirements or designs has been developed in enough detail to be usable by a particular stakeholder, is internally consistent, and is of high quality.
- **Validate Requirements**: ensures that a set of requirements or designs delivers business value and supports the organization's goals and objectives.
- **Define Requirements Architecture**: structures all requirements and designs so that they support the overall business purpose for a change and that they work effectively as a cohesive whole.
- **Define Solution Options**: identifies, explores and describes different possible ways of meeting the need.
- **Analyze Potential Value and Recommend Solution**: assesses the business value associated with a potential solution and compares different options, including trade-offs, to identify and recommend the solution option that delivers the greatest overall value.

The Core Concept Model in Requirements Analysis and Design Definition

The *Business Analysis Core Concept Model*™ (*BACCM*™) describes the relationships among the six core concepts. The following table describes the usage and application of each of the core concepts within the context of Requirements Analysis and Design Definition.

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Table 7.0.1: The Core Concept Model in Requirements Analysis and Design Definition

Core Concept	During Requirements Analysis and Design Definition, business analysts...
Change: the act of transformation in response to a need.	transform elicitation results into requirements and designs in order to define the change.
Need: a problem or opportunity to be addressed.	analyze the needs in order to recommend a solution that meets the needs.
Solution: a specific way of satisfying one or more needs within a context.	define solution options and recommend the one that is most likely to address the need and has the most value.
Stakeholder: a group or individual with a relationship to the change, the need, or the solution.	tailor the requirements and designs so that they are understandable and usable by each stakeholder group.
Value: the worth, importance, or usefulness of something to a stakeholder within a context.	analyze and quantify the potential value of the solution options.
Context: the circumstances that influence, are influenced by, and provide understanding of the change.	model and describe the context in formats that are understandable and usable by all stakeholders.

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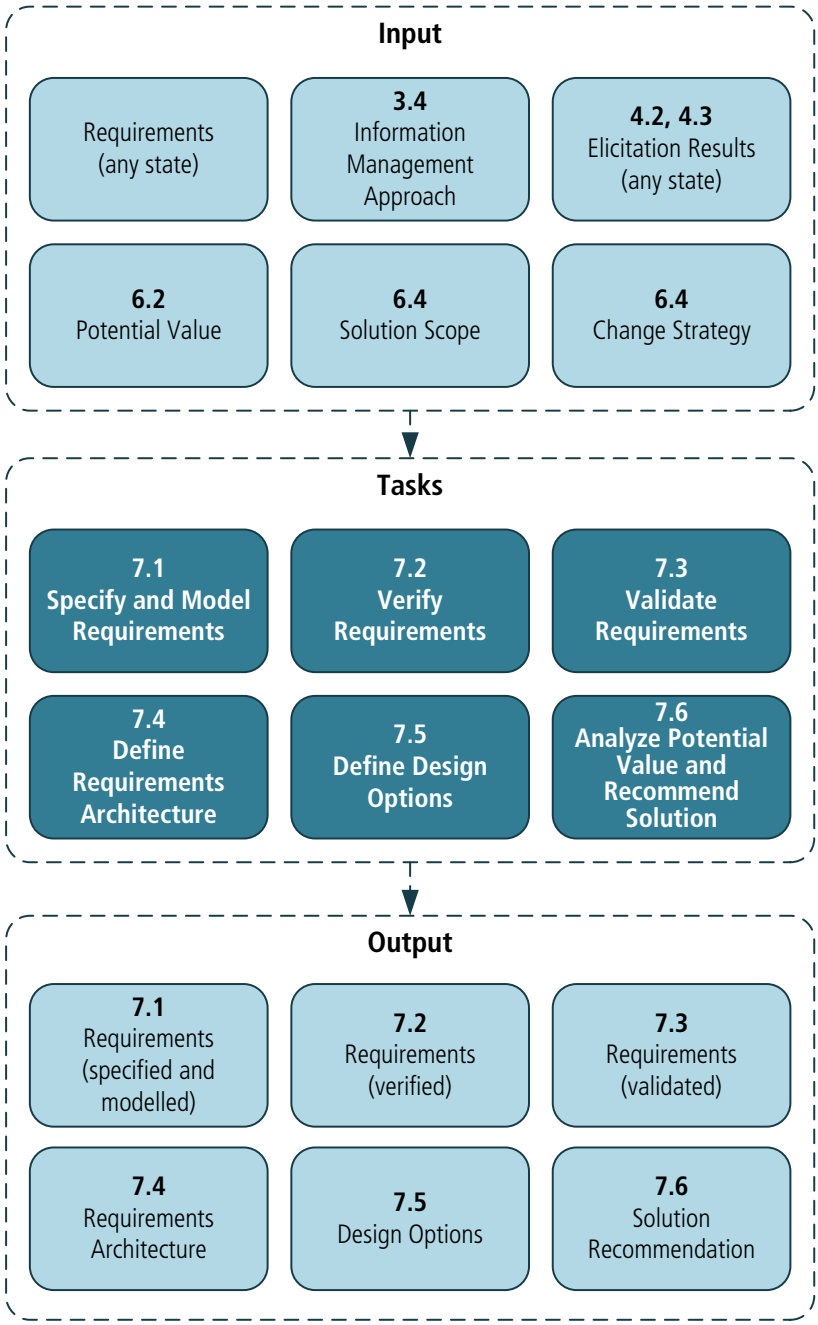
Figure 7.0.2: Requirements Analysis and Design Definition Input/Output Diagram



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7.1 Specify and Model Requirements

7.1.1 Purpose

The purpose of Specify and Model Requirements is to analyze, synthesize, and refine elicitation results into requirements and designs.

7.1.2 Description

Specify and Model Requirements describes the practices for analyzing elicitation

results and creating representations of those results. When the focus of the specifying and modelling activity is on understanding the need, the outputs are referred to as requirements. When the focus of the specifying and modelling activity is on a solution, the outputs are referred to as designs.

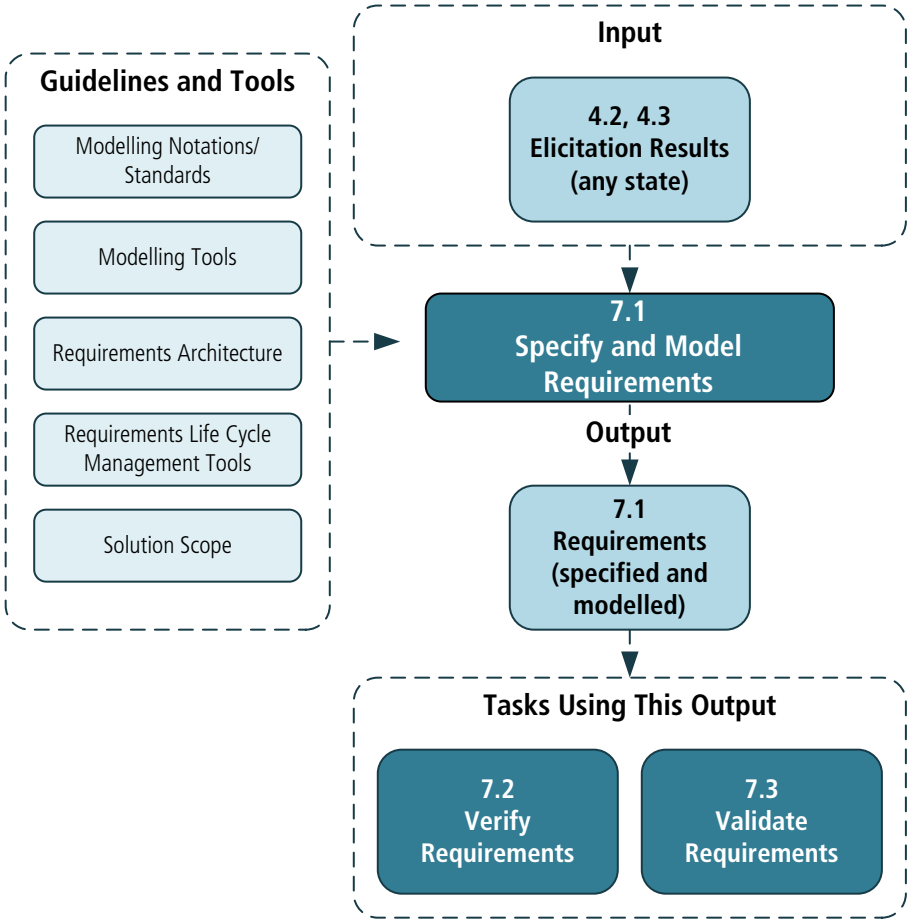
Important In many IT environments, the word 'design' is used specifically for technical designs created by software developers, data architects, and other implementation subject matter experts. All business deliverables are referred to as 'requirements'.

In addition to the models used to represent the requirements, this task also includes capturing information about attributes or metadata about the requirements. The specifying and modelling activities relate to all requirement types.

7.1.3 Inputs

- **Elicitation Results (any state)**: modelling can begin with any elicitation result and may lead to the need for more elicitation to clarify or expand upon requirements. Elicitation and modelling may occur sequentially, iteratively, or concurrently.

Figure 7.1.1: Specify and Model Requirements Input/Output Diagram



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7.1.4 Elements

.1 Model Requirements

A model is a descriptive and visual way to convey information to a specific audience in order to support analysis, communication, and understanding. Models may also be used to confirm knowledge, identify information gaps that the business analyst may have, and identify duplicate information.

Business analysts choose from one or more of the following modelling formats:

- **Matrices**: a matrix is used when the business analyst is modelling a requirement or set of requirements that have a complex but uniform structure, which can be broken down into elements that apply to every entry in the table. Matrices may be used for data dictionaries, requirements traceability, or for gap analysis. Matrices are also used for prioritizing requirements and recording other requirements attributes and metadata.
- **Diagrams**: a diagram is a visual, often pictorial, representation of a requirement or set of requirements. A diagram is especially useful to depict complexity in a way that would be difficult to do with words. Diagrams can also be used to define boundaries for business domains, to categorize and create hierarchies of items, and to show components of objects such as data and their relationships.

Using one or more of the model formats, business analysts determine specific categories and specific models within categories to be used. Model categories can include:

- **People and Roles**: models represent organizations, groups of people, roles, and their relationships within an enterprise and to a solution. Techniques used to represent people and their roles include Organizational Modelling, Roles and Permissions Matrix and Stakeholder List, Map, or Personas.
- **Rationale**: models represent the 'why' of a change. Techniques used to represent the rationale include Decision Modelling, Scope Modelling, Business Model Canvas, Root Cause Analysis, and Business Rules Analysis.
- **Activity Flow**: models represent a sequence of actions, events, or a course that may be taken. Techniques used to represent activity flows include Process Modelling, Use Cases and Scenarios, and User Stories.
- **Capability**: models focus on features or functions of an enterprise or a solution. Techniques used to represent capabilities include Business Capability Analysis, Functional Decomposition, and Prototyping.
- **Data and Information**: models represent the characteristics and the exchange of information within an enterprise or a solution. Techniques used to represent data and information include Data Dictionary, Data Flow Diagrams, Data Modelling, Glossary, State Modelling, and Interface Analysis.

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Business analysts should use any combination of models best suited to meet stakeholder needs in a given context. Each modelling technique has strengths and weaknesses and provides unique insights into the business domain.

.2 Analyze Requirements

Business analysis information is decomposed into components to further examine for:

- anything that must change to meet the business need,
- anything that should stay the same to meet the business need,
- missing components,
- unnecessary components, and
- any constraints or assumptions that impact the components.

The level of decomposition required, and the level of detail to be specified, varies depending on the knowledge and understanding of the stakeholders, the potential for misunderstanding or miscommunication, organizational standards, and contractual or regulatory obligations, among other factors.

Analysis provides a basis for discussion to reach a conclusion about solution options.

.3 Represent Requirements and Attributes

Business analysts identify information for requirements and their attributes as part of the elicitation results. Requirements should be explicitly represented and should include enough detail such that they exhibit the characteristics of requirements and designs quality (see Verify Requirements (p. 141)). Various attributes can be specified for each requirement or set of requirements. These attributes are selected when planning for information management (see Plan Business Analysis Information Management (p. 42)).

As part of specifying requirements, they can also be categorized according to the schema described in task Requirements Classification Schema (p. 16). Typically elicitation results contain information of different types, so it is natural to expect that different types of requirements might be specified at the same time. Categorizing requirements can help ensure the requirements are fully understood, a set of any type is complete, and that there is appropriate traceability between the types.

.4 Implement the Appropriate Levels of Abstraction

The level of abstraction of a requirement varies based on the type of requirement and audience for the requirement. Not all stakeholders require or find value in the complete set of requirements and models. It may be appropriate to produce different viewpoints of requirements to represent the same need for different stakeholders. Business analysts take special care to maintain the meaning and intent of the requirements over all representations.

The business analysis approach may also influence the level of abstraction and choice of models used when defining requirements.

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7.1.5 Guidelines and Tools

- **Modelling Notations/Standards**: allow requirements and designs to be precisely specified, as is appropriate for the audience and the purpose of the models. Standard templates and syntax help to ensure that the right information is provided about the requirements.
- **Modelling Tools**: software products that facilitate drawing and storing matrices and diagrams to represent requirements. This functionality may or may not be part of requirements life cycle management tools.
- **Requirements Architecture**: the requirements and interrelationships among them can be used to ensure models are complete and consistent.
- **Requirements Life Cycle Management Tools**: software products that facilitate recording, organizing, storing, and sharing requirements and designs.
- **Solution Scope**: the boundaries of the solution provide the boundaries for the requirements and designs models.

7.1.6 Techniques

- **Acceptance and Evaluation Criteria**: used to represent the acceptance and evaluation criteria attributes of requirements.
- **Business Capability Analysis**: used to represent features or functions of an enterprise.
- **Business Model Canvas**: used to describe the rationale for requirements.
- **Business Rules Analysis**: used to analyze business rules so that they can be specified and modelled alongside requirements.
- **Concept Modelling**: used to define terms and relationships relevant to the change and the enterprise.
- **Data Dictionary**: used to record details about the data involved in the change. Details may include definitions, relationships with other data, origin, format, and usage.
- **Data Flow Diagrams**: used to visualize data flow requirements.
- **Data Modelling**: used to model requirements to show how data will be used to meet stakeholder information needs.
- **Decision Modelling**: used to represent decisions in a model in order to show the elements of decision making required.
- **Functional Decomposition**: used to model requirements in order to identify constituent parts of an overall complex business function.
- **Glossary**: used to record the meaning of relevant business terms while analyzing requirements.
- **Interface Analysis**: used to model requirements in order to identify and validate inputs and outputs of the solution they are modelling.
- **Non-Functional Requirements Analysis**: used to define and analyze the quality of service attributes.

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- **Organizational Modelling**: used to allow business analysts to model the roles, responsibilities, and communications within an organization.
- **Process Modelling**: used to show the steps or activities that are performed in the organization, or that must be performed to meet the desired change.
- **Prototyping**: used to assist the stakeholders in visualizing the appearance and capabilities of a planned solution.
- **Roles and Permissions Matrix**: used to specify and model requirements concerned with the separation of duties among users and external interfaces in utilizing a solution.
- **Root Cause Analysis**: used to model the root causes of a problem as part of rationale.
- **Scope Modelling**: used to visually show a scope boundary.
- **Sequence Diagrams**: used to specify and model requirements to show how processes operate and interact with one another, and in what order.
- **Stakeholder List, Map, or Personas**: used to identify the stakeholders and their characteristics.
- **State Modelling**: used to specify the different states of a part of the solution throughout a life cycle, in terms of the events that occur.
- **Use Cases and Scenarios**: used to model the desired behaviour of a solution, by showing user interactions with the solution, to achieve a specific goal or accomplish a particular task.
- **User Stories**: used to specify requirements as a brief statement about what people do or need to do when using the solution.

7.1.7 Stakeholders

- **Any stakeholder**: business analysts may choose to perform this task themselves and then separately package and communicate the requirements to stakeholders for their review and approval, or they might choose to invite some or all stakeholders to participate in this task.

7.1.8 Outputs

- **Requirements (specified and modelled)**: any combination of requirements and/or designs in the form of text, matrices, and diagrams.

7.2 Verify Requirements

7.2.1 Purpose

The purpose of Verify Requirements is to ensure that requirements and designs specifications and models meet quality standards and are usable for the purpose they serve.

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7.2.2 Description

Verifying requirements ensures that the requirements and designs have been defined correctly. Requirements verification constitutes a check by the business analyst and key stakeholders to determine that the requirements and designs are ready for validation, and provides the information needed for further work to be performed.

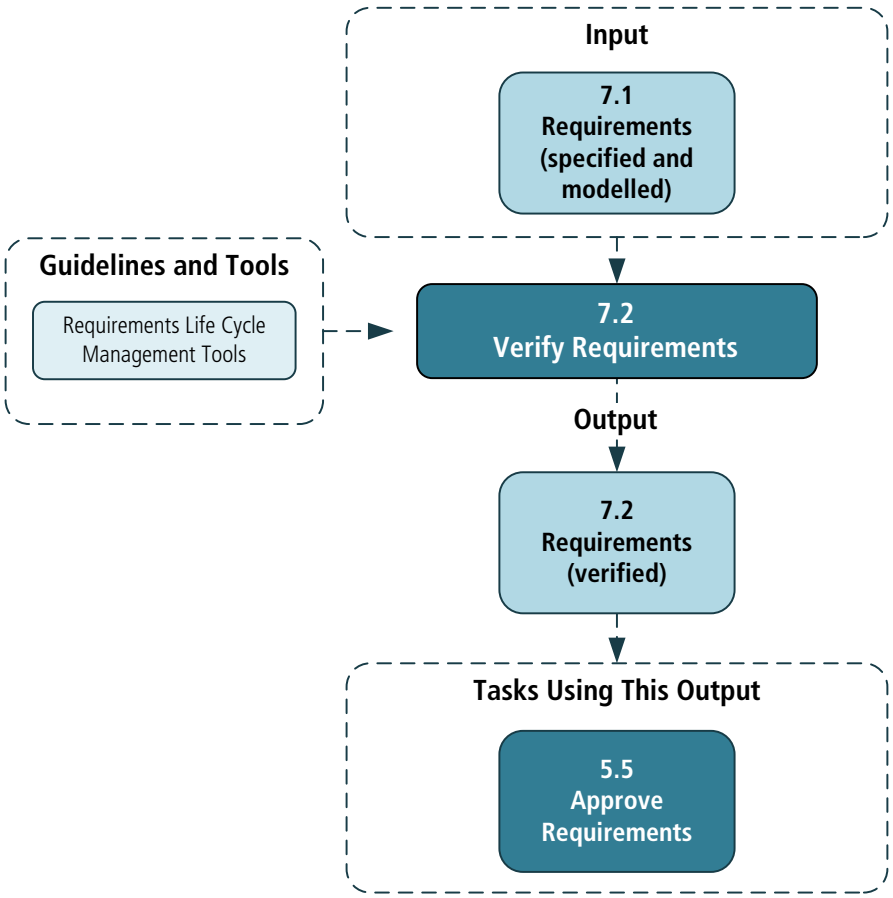
A high-quality specification is well written and easily understood by its intended audience. A high-quality model follows the formal or informal notation standards and effectively represents reality.

The most important characteristic of quality requirements and designs is fitness for use. They must meet the needs of stakeholders who will use them for a particular purpose. Quality is ultimately determined by stakeholders.

7.2.3 Inputs

- **Requirements (specified and modelled)**: any requirement, design, or set of those may be verified to ensure that text is well structured and that matrices and modelling notation are used correctly.

Figure 7.2.1: Verify Requirements Input/Output Diagram



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7.2.4 Elements

.1 Characteristics of Requirements and Designs Quality

While quality is ultimately determined by the needs of the stakeholders who will use the requirements or the designs, acceptable quality requirements exhibit many of the following characteristics:

- **Atomic**: self-contained and capable of being understood independently of other requirements or designs.
- **Complete**: enough to guide further work and at the appropriate level of detail for work to continue. The level of completeness required differs based on perspective or methodology, as well as the point in the life cycle where the requirement is being examined or represented.
- **Consistent**: aligned with the identified needs of the stakeholders and not conflicting with other requirements.
- **Concise**: contains no extraneous and unnecessary content.
- **Feasible**: reasonable and possible within the agreed-upon risk, schedule, and budget, or considered feasible enough to investigate further through experiments or prototypes.
- **Unambiguous**: the requirement must be clearly stated in such a way to make it clear whether a solution does or does not meet the associated need.
- **Testable**: able to verify that the requirement or design has been fulfilled. Acceptable levels of verifying fulfillment depend on the level of abstraction of the requirement or design.
- **Prioritized**: ranked, grouped, or negotiated in terms of importance and value against all other requirements.
- **Understandable**: represented using common terminology of the audience.

.2 Verification Activities

Verification activities are typically performed iteratively throughout the requirements analysis process.

Verification activities include:

- checking for compliance with organizational performance standards for business analysis, such as using the right tools and methods,
- checking for correct use of modelling notation, templates, or forms,
- checking for completeness within each model,
- comparing each model against other relevant models, checking for elements that are mentioned in one model but are missing in other models, and verifying that the elements are referenced consistently,
- ensuring the terminology used in expressing the requirement is understandable to stakeholders and consistent with the use of those terms within the organization, and

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- adding examples where appropriate for clarification.

.3 Checklists

Checklists are used for quality control when verifying requirements and designs. Checklists may include a standard set of quality elements that business analysts use to verify the requirements, or they may be specifically developed to capture issues of concern. The purpose of a checklist is to ensure that items determined to be important are included in the final requirements deliverables, or that steps required for the verification process are followed.

7.2.5 Guidelines and Tools

- **Requirements Life Cycle Management Tools**: some tools have functionality to check for issues related to many of the characteristics, such as atomic, unambiguous, and prioritized.

7.2.6 Techniques

- **Acceptance and Evaluation Criteria**: used to ensure that requirements are stated clearly enough to devise a set of tests that can prove that the requirements have been met.
- **Item Tracking**: used to ensure that any problems or issues identified during verification are managed and resolved.
- **Metrics and Key Performance Indicators (KPIs)**: used to identify how to evaluate the quality of the requirements.
- **Reviews**: used to inspect requirements documentation to identify requirements that are not of acceptable quality.

7.2.7 Stakeholders

- **All stakeholders**: the business analyst, in conjunction with the domain and implementation subject matter experts, has the primary responsibility for determining that this task has been completed. Other stakeholders may discover problematic requirements during requirements communication. Therefore, all stakeholders could be involved in this task.

7.2.8 Outputs

- **Requirements (verified)**: a set of requirements or designs that is of sufficient quality to be used as a basis for further work.

7.3 Validate Requirements

7.3.1 Purpose

The purpose of Validate Requirements is to ensure that all requirements and

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designs align to the business requirements and support the delivery of needed value.

7.3.2 Description

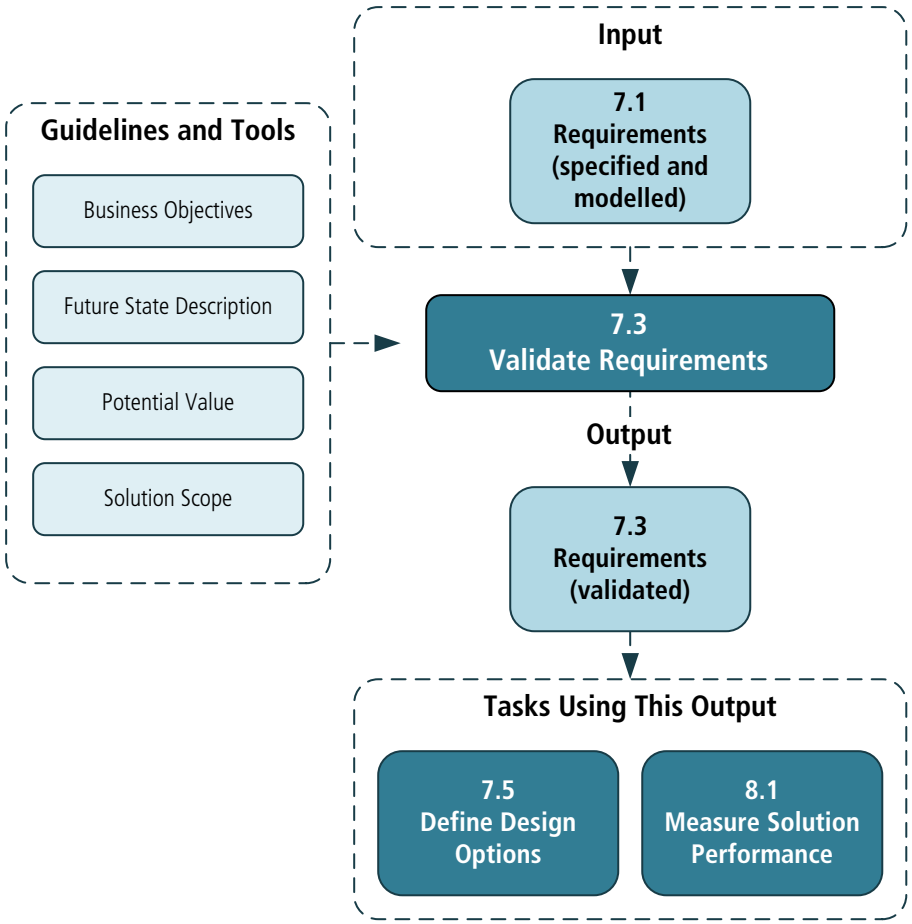
Requirements validation is an ongoing process to ensure that stakeholder, solution, and transition requirements align to the business requirements and that the designs satisfy the requirements.

Understanding what the desired future state looks like for stakeholders after their needs have been met is valuable to business analysts when validating requirements. The overall goal of implementing the requirements is to achieve the stakeholders' desired future state. In many cases, stakeholders have different, conflicting needs and expectations that may be exposed through the validation process.

7.3.3 Inputs

- **Requirements (specified and modelled)**: any types of requirements and designs can be validated. Validation activities may begin before requirements are completely verified. However, validation activities cannot be completed before requirements are completely verified.

Figure 7.3.1: Validate Requirements Input/Output Diagram



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7.3.4 Elements

.1 Identify Assumptions

If an organization is launching an unprecedented product or service, it may be necessary to make assumptions about customer or stakeholder response, as there are no similar previous experiences on which to rely. In other cases, it may be difficult or impossible to prove that a particular problem derives from an identified root cause. Stakeholders may have assumed that certain benefits will result from the implementation of a requirement. These assumptions are identified and defined so that associated risks can be managed.

.2 Define Measurable Evaluation Criteria

While the expected benefits are defined as part of the future state, the specific measurement criteria and evaluation process may not have been included. Business analysts define the evaluation criteria that will be used to evaluate how successful the change has been after the solution is implemented. Baseline metrics might be established based on the current state. Target metrics can be developed to reflect the achievement of the business objectives or some other measurement of success.

.3 Evaluate Alignment with Solution Scope

A requirement can be of benefit to a stakeholder and still not be a desirable part of a solution. A requirement that does not deliver benefit to a stakeholder is a strong candidate for elimination. When requirements do not align, either the future state must be re-evaluated and the solution scope changed, or the requirement removed from the solution scope.

If a design cannot be validated to support a requirement, there might be a missing or misunderstood requirement, or the design must change.

7.3.5 Guidelines and Tools

- **Business Objectives**: ensure the requirements deliver the desired business benefits.
- **Future State Description**: helps to ensure the requirements that are part of the solution scope do help achieve the desired future state.
- **Potential Value**: can be used as a benchmark against which the value delivered by requirements can be assessed.
- **Solution Scope**: ensures the requirements that provide benefit are within the scope of the desired solution.

7.3.6 Techniques

- **Acceptance and Evaluation Criteria**: used to define the quality metrics that must be met to achieve acceptance by a stakeholder.

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- **Document Analysis**: used to identify previously documented business needs in order to validate requirements.
- **Financial Analysis**: used to define the financial benefits associated with requirements.
- **Item Tracking**: used to ensure that any problems or issues identified during validation are managed and resolved.
- **Metrics and Key Performance Indicators (KPIs)**: used to select appropriate performance measures for a solution, solution component, or requirement.
- **Reviews**: used to confirm whether or not the stakeholder agrees that their needs are met.
- **Risk Analysis and Management**: used to identify possible scenarios that would alter the benefit delivered by a requirement.

7.3.7 Stakeholders

- **All stakeholders**: the business analyst, in conjunction with the customer, end users, and sponsors, has the primary responsibility for determining whether or not requirements are validated. Other stakeholders may discover problematic requirements during requirements communication. Therefore, virtually all project stakeholders are involved in this task.

7.3.8 Outputs

- **Requirements (validated)**: validated requirements and designs are those that can be demonstrated to deliver benefit to stakeholders and align with the business goals and objectives of the change. If a requirement or design cannot be validated, it either does not benefit the organization, does not fall within the solution scope, or both.

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7.4 Define Requirements Architecture

7.4.1 Purpose

The purpose of Define Requirements Architecture is to ensure that the requirements collectively support one another to fully achieve the objectives.

7.4.2 Description

Requirements architecture is the structure of all of the requirements of a change. A requirements architecture fits the individual models and specifications together to ensure that all of the requirements form a single whole that supports the overall business objectives and produces a useful outcome for stakeholders.

Business analysts use a requirements architecture to:

- understand which models are appropriate for the domain, solution scope, and audience,
- organize requirements into structures relevant to different stakeholders,
- illustrate how requirements and models interact with and relate to each other, and show how the parts fit together into a meaningful whole,
- ensure the requirements work together to achieve the overall objectives, and
- make trade-off decisions about requirements while considering the overall objectives.

Requirements architecture is not intended to demonstrate traceability, but rather to show how elements work in harmony with one another to support the business requirements, and to structure them in various ways to align the viewpoints of different stakeholders. Traceability is often used as the mechanism to represent and manage these relationships (see Trace Requirements (p. 79)). Traceability proves that every requirement links back to an objective and shows how an objective was met. Traceability does not prove the solution is a cohesive whole that will work.

7.4.3 Inputs

- **Information Management Approach**: defines how the business analysis information (including requirements and models) will be stored and accessed.
- **Requirements (any state)**: every requirement should be stated once, and only once, and incorporated into the requirements architecture so that the entire set may be evaluated for completeness.
- **Solution Scope**: must be considered to ensure the requirements architecture is aligned with the boundaries of the desired solution.

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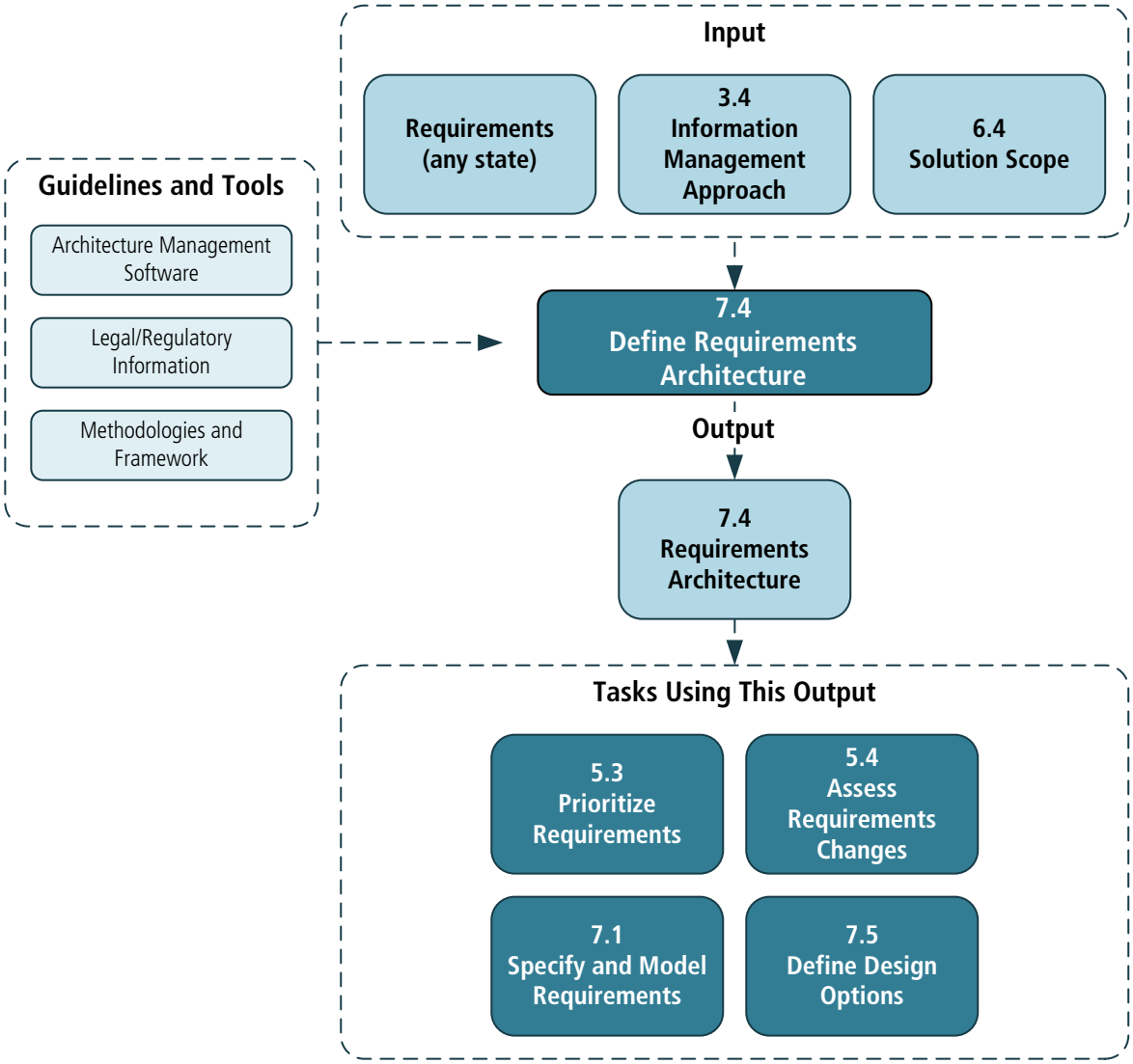
Figure 7.4.1: Define Requirements Architecture Input/Output Diagram



7.4.4 Elements

.1 Requirements Viewpoints and Views

A viewpoint is a set of conventions that define how requirements will be represented, how these representations will be organized, and how they will be related. Viewpoints provide templates for addressing the concerns of particular stakeholder groups.

Requirements viewpoints frequently include standards and guidelines for the:

- model types used for requirements,
- attributes that are included and consistently used in different models,
- model notations that are used, and
- analytical approaches used to identify and maintain relevant relationships among models.

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No single viewpoint alone can form an entire architecture. Each viewpoint is stronger for some aspects of the requirements, and weaker for others, as different groups of stakeholders have different concerns. Trying to put too much information into any one viewpoint will make it too complex and degrade its purpose. Examples of viewpoints include:

- Business process models,
- Data models and information,
- User interactions, including use cases and/or user experience,
- Audit and security, and
- Business models.

Each of those viewpoints has different model notations and techniques, and each is important to ensure a cohesive final solution. The solution would likely not be a success if the business analyst only looked at the business process viewpoint. Similarly, trying to put conventions from many viewpoints in one single viewpoint would make it overwhelming to analyze and contain information irrelevant to particular stakeholder groups.

The actual requirements and designs for a particular solution from a chosen viewpoint are referred to as a view. A collection of views makes up the requirements architecture for a specific solution. Business analysts align, coordinate, and structure requirements into meaningful views for the various stakeholders. This set of coordinated, complementary views provides a basis for assessing the completeness and coherence of the requirements.

In short, the viewpoints tell business analysts what information they should provide for each stakeholder group to address their concerns, while views describe the actual requirements and designs that are produced.

.2 Template Architectures

An architectural framework is a collection of viewpoints that is standard across an industry, sector, or organization. Business analysts can treat frameworks as predefined templates to start from in defining their architecture. Similarly, the framework can be populated with domain-specific information to form a collection of views that is an even more useful template to build architecture from if it is accurate because the information is already populated in it.

.3 Completeness

An architecture helps ensure that a set of requirements is complete. The entire set of requirements should be able to be understood by the audience in way that it can be determined that the set is cohesive and tells a full story. No requirements should be missing from the set, inconsistent with others, or contradictory to one another. The requirements architecture should take into account any dependencies between requirements that could keep the objectives from being achieved.

Structuring requirements according to different viewpoints helps ensure this

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completeness. Iterations of elicitation, specification, and analysis activities can help identify gaps.

.4 Relate and Verify Requirements Relationships

Requirements may be related to each other in several ways when defining the requirements architecture. Business analysts examine and analyze the requirements to define the relationships between them. The representation of these relationships is provided by tracing requirements (see Trace Requirements (p. 79)).

Business analysts examine each relationship to ensure that the relationships satisfy the following quality criteria:

- **Defined**: there is a relationship and the type of the relationship is described.
- **Necessary**: the relationship is necessary for understanding the requirements holistically.
- **Correct**: the elements do have the relationship described.
- **Unambiguous**: there are no relationships that link elements in two different and conflicting ways.
- **Consistent**: relationships are described in the same way, using the same set of standard descriptions as defined in the viewpoints.

.5 Business Analysis Information Architecture

The structure of the business analysis information is also an information architecture. This type of architecture is defined as part of the task Plan Business Analysis Information Management (p. 42). The information architecture is a component of the requirements architecture because it describes how all of the business analysis information for a change relates. It defines relationships for types of information such as requirements, designs, types of models, and elicitation results. Understanding this type of information structure helps to ensure that the full set of requirements is complete by verifying the relationships are complete. It is useful to start defining this architecture before setting up infrastructure such as requirements life cycle management tools, architecture management software, or document repositories.

7.4.5 Guidelines and Tools

- **Architecture Management Software**: modelling software can help to manage the volume, complexity, and versions of the relationships within the requirements architecture.
- **Legal/Regulatory Information**: describes legislative rules or regulations that must be followed. They may impact the requirements architecture or its outputs. Additionally, contractual or standards-based constraints may also need to be considered.

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- **Methodologies and Frameworks**: a predetermined set of models, and relationships between the models, to be used to represent different viewpoints.

7.4.6 Techniques

- **Data Modelling**: used to describe the requirements structure as it relates to data.
- **Functional Decomposition**: used to break down an organizational unit, product scope, or other elements into its component parts.
- **Interviews**: used to define the requirements structure collaboratively.
- **Organizational Modelling**: used to understand the various organizational units, stakeholders, and their relationships which might help define relevant viewpoints.
- **Scope Modelling**: used to identify the elements and boundaries of the requirements architecture.
- **Workshops**: used to define the requirements structure collaboratively.

7.4.7 Stakeholders

- **Domain Subject Matter Expert, Implementation Subject Matter Expert, Project Manager, Sponsor, Tester**: may assist in defining and confirming the requirements architecture.
- **Any stakeholder**: may also use the requirements architecture to assess the completeness of the requirements.

7.4.8 Outputs

- **Requirements Architecture**: the requirements and the interrelationships among them, as well as any contextual information that is recorded.

7.5 Define Design Options

7.5.1 Purpose

The purpose of Define Design Options is to define the solution approach, identify opportunities to improve the business, allocate requirements across solution components, and represent design options that achieve the desired future state.

7.5.2 Description

When designing a solution, there may be one or more design options identified. Each design option represents a way to satisfy a set of requirements. Design options exist at a lower level than the change strategy, and are tactical rather than strategic. As a solution is developed, tactical trade-offs may need to be made

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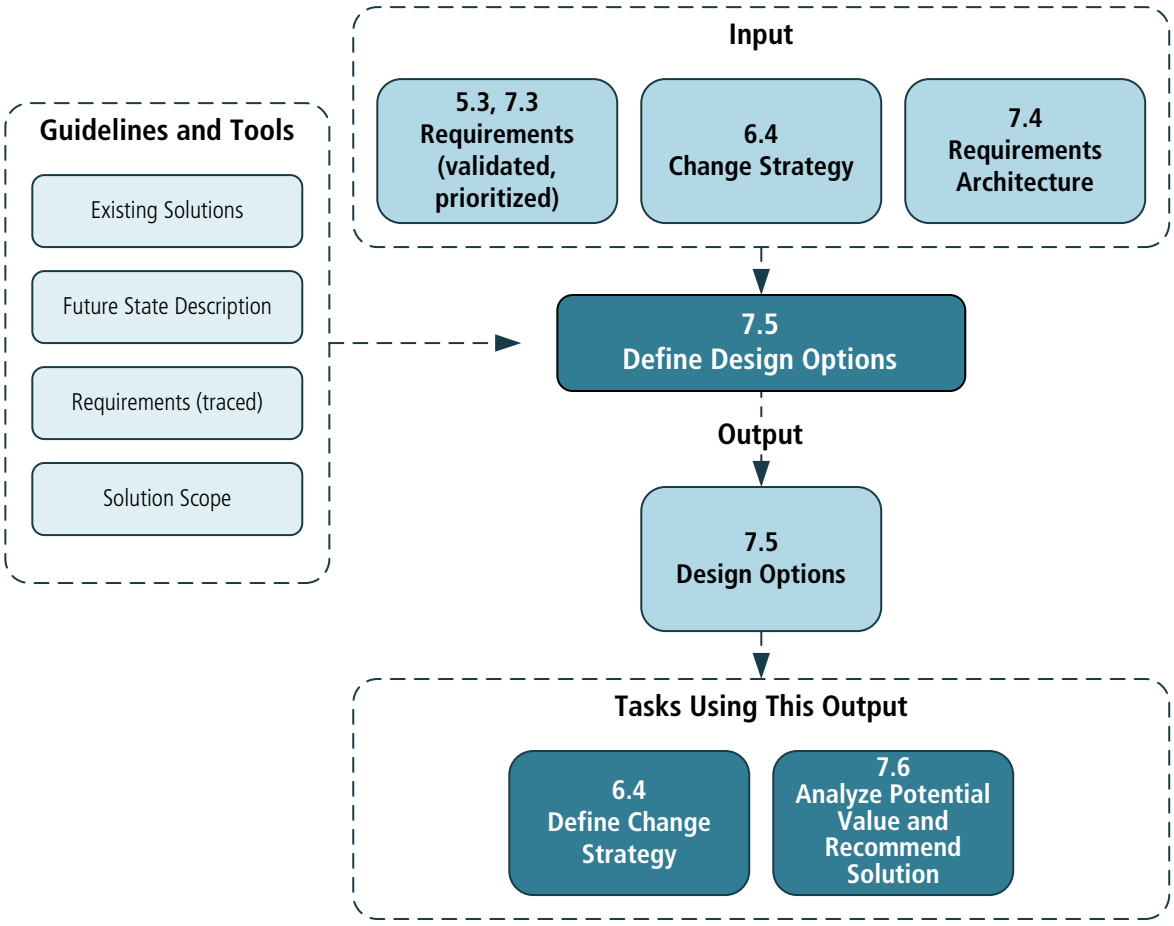
among design alternatives. Business analysts must assess the effect these trade-offs will have on the delivery of value to stakeholders. As initiatives progress and requirements evolve, design options evolve as well.

7.5.3 Inputs

- **Change Strategy**: describes the approach that will be followed to transition to the future state. This may have some impact on design decisions in terms of what is feasible or possible.
- **Requirements (validated, prioritized)**: only validated requirements are considered in design options. Knowing the requirement priorities aids in the suggestion of reasonable design options. Requirements with the highest priorities might deserve more weight in choosing solution components to best meet them as compared to lower priority requirements.
- **Requirements Architecture**: the full set of requirements and their relationships is important for defining design options that can address the holistic set of requirements.

Figure 7.5.1: Define Design Options Input/Output Diagram



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7.5.4 Elements

.1 Define Solution Approaches

The solution approach describes whether solution components will be created or purchased, or some combination of both. Business analysts assess the merits of the solution approaches for each design option.

Solution approaches include:

- **Create**: solution components are assembled, constructed, or developed by experts as a direct response to a set of requirements. The requirements and the design options have enough detail to make a decision about which solution to construct. This option includes modifying an existing solution.
- **Purchase**: solution components are selected from a set of offerings that fulfill the requirements. The requirements and design options have enough detail to make a recommendation about which solution to purchase. These offerings are usually products or services owned and maintained by third parties.
- **Combination of both**: not all design options will fall strictly into one of the categories above. Design options may include a combination of both creation and purchase of components.

In all of these types of approaches, proposed integration of the components is also considered within the design option.

.2 Identify Improvement Opportunities

When proposing design options, a number of opportunities to improve the operation of the business may occur and are compared.

Some common examples of opportunities include:

- **Increase Efficiencies**: automate or simplify the work people perform by re-engineering or sharing processes, changing responsibilities, or outsourcing. Automation may also increase consistency of behaviour, reducing the likelihood of different stakeholders performing the same function in distinctly different fashions.
- **Improve Access to Information**: provide greater amounts of information to staff who interface directly or indirectly with customers, thereby reducing the need for specialists.
- **Identify Additional Capabilities**: highlight capabilities that have the potential to provide future value and can be supported by the solution. These capabilities may not necessarily be of immediate value to the organization (for example, a software application with features the organization anticipates using in the future).

.3 Requirements Allocation

Requirements allocation is the process of assigning requirements to solution components and releases to best achieve the objectives. Allocation is supported

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by assessing the trade-offs between alternatives in order to maximize benefits and minimize costs. The value of a solution might vary depending on how requirements are implemented and when the solution becomes available to stakeholders. The objective of allocation is to maximize that value.

Requirements may be allocated between organizational units, job functions, solution components, or releases of a solution. Requirements allocation typically begins when a solution approach has been determined, and continues until all valid requirements are allocated. Allocation typically continues through design and implementation of a solution.

.4 Describe Design Options

Design options are investigated and developed while considering the desired future state, and in order to ensure the design option is valid. Solution performance measures are defined for each design option.

A design option usually consists of many design components, each described by a design element. Design elements may describe:

- business policies and business rules,
- business processes to be performed and managed,
- people who operate and maintain the solution, including their job functions and responsibilities,
- operational business decisions to be made,
- software applications and application components used in the solution, and
- organizational structures, including interactions between the organization, its customers, and its suppliers.

7.5.5 Guidelines and Tools

- **Existing Solutions**: existing products or services, often third party, that are considered as a component of a design option.
- **Future State Description**: identifies the desired state of the enterprise that the design options will be part of, and helps to ensure design options are viable.
- **Requirements (traced)**: define the design options that best fulfill known requirements.
- **Solution Scope**: defines the boundaries when selecting viable design options.

7.5.6 Techniques

- **Benchmarking and Market Analysis**: used to identify and analyze existing solutions and market trends.
- **Brainstorming**: used to help identify improvement opportunities and design options.
- **Document Analysis**: used to provide information needed to describe design options and design elements.

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- **Interviews**: used to help identify improvement opportunities and design options.
- **Lessons Learned**: used to help identify improvement opportunities.
- **Mind Mapping**: used to identify and explore possible design options.
- **Root Cause Analysis**: used to understand the underlying cause of the problems being addressed in the change to propose solutions to address them.
- **Survey or Questionnaire**: used to help identify improvement opportunities and design options.
- **Vendor Assessment**: used to couple the assessment of a third party solution with an assessment of the vendor to ensure that the solution is viable and all parties will be able to develop and maintain a healthy working relationship.
- **Workshops**: used to help identify improvement opportunities and design options.

7.5.7 Stakeholders

- **Domain Subject Matter Expert**: provides the expertise within the business to provide input and feedback when evaluating solution alternatives, particularly for the potential benefits of a solution.
- **Implementation Subject Matter Expert**: use their expertise in terms of the design options being considered to provide needed input about the constraints of a solution and its costs.
- **Operational Support**: can help evaluate the difficulty and costs of integrating proposed solutions with existing processes and systems.
- **Project Manager**: plans and manages the solution definition process, including the solution scope and any risks associated with the proposed solutions.
- **Supplier**: provides information on the functionality associated with a particular design option.

7.5.8 Outputs

- **Design Options**: describe various ways to satisfy one or more needs in a context. They may include solution approach, potential improvement opportunities provided by the option, and the components that define the option.

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7.6 Analyze Potential Value and Recommend Solution

7.6.1 Purpose

The purpose of Analyze Potential Value and Recommend Solution is to estimate the potential value for each design option and to establish which one is most appropriate to meet the enterprise's requirements.

7.6.2 Description

Analyze Potential Value and Recommend Solution describes how to estimate and model the potential value delivered by a set of requirements, designs, or design options. Potential value is analyzed many times over the course of a change. This analysis may be a planned event, or it may be triggered by a modification to the context or scope of the change. The analysis of potential value includes consideration that there is uncertainty in the estimates. Value can be described in terms of finance, reputation, or even impact on the marketplace. Any change may include a mix of increases and decreases in value.

Design options are evaluated by comparing the potential value of each option to the other options. Each option has a mix of advantages and disadvantages to consider. Depending on the reasons for the change, there may be no best option to recommend, or there may be a clear best choice. In some cases this means the best option may be to begin work against more than one design option, perhaps to develop proofs of concept, and then measure the performance of each. In other instances, all proposed designs may be rejected and more analysis may be needed to define a suitable design. It is also possible that the best recommendation is to do nothing.

7.6.3 Inputs

- **Potential Value**: can be used as a benchmark against which the value delivered by a design can be evaluated.
- **Design Options**: need to be evaluated and compared to one another to recommend one option for the solution.

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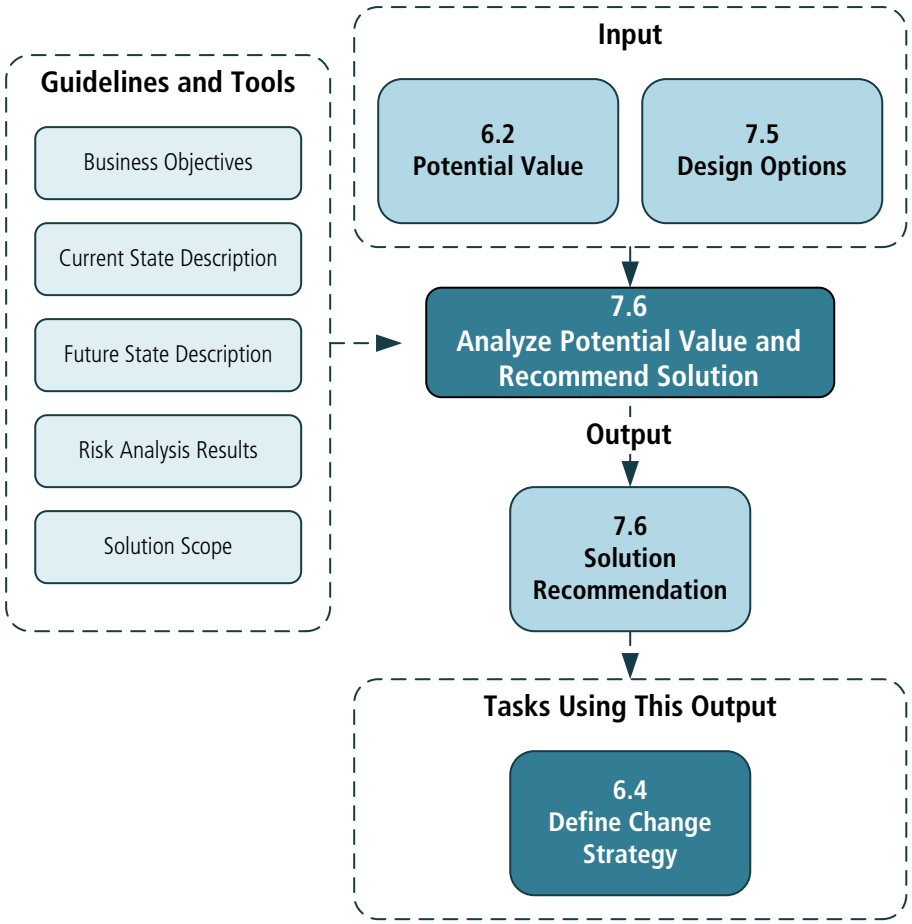
Figure 7.6.1: Analyze Potential Value and Recommend Solution Input/Output Diagram



7.6.4 Elements

.1 Expected Benefits

Expected benefits describe the positive value that a solution is intended to deliver to stakeholders. Value can include benefits, reduced risk, compliance with business policies and regulations, an improved user experience, or any other positive outcome. Benefits are determined based on the analysis of the benefit that stakeholders desire and the benefit that is possible to attain. Expected benefits can be calculated at the level of a requirement or set of requirements by considering how much of an overall business objective the set of requirements contribute to if fulfilled. The total expected benefit is the net benefit of all the requirements a particular design option addresses. Benefits are often realized over a period of time.

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.2 Expected Costs

Expected costs include any potential negative value associated with a solution, including the cost to acquire the solution, any negative effects it may have on stakeholders, and the cost to maintain it over time.

Expected costs can include:

- timeline,
- effort,
- operating costs,
- purchase and/or implementation costs,
- maintenance costs,
- physical resources,
- information resources, and
- human resources.

Expected costs for a design option consider the cumulative costs of the design components.

Business analysts also consider opportunity cost when estimating the expected cost of a change. Opportunity costs are alternative results that might have been achieved if the resources, time, and funds devoted to one design option had been allocated to another design option. The opportunity cost of any design option is equal to the value of the best alternative not selected.

.3 Determine Value

The potential value of a solution to a stakeholder is based on the benefits delivered by that solution and the associated costs. Value can be positive (if the benefits exceed the costs) or negative (if the costs exceed the benefits).

Business analysts consider potential value from the points of view of stakeholders. Value to the enterprise is almost always more heavily weighted than value for any individual stakeholder groups. There might be increases in value for one set of stakeholders and decreases in value for another set, but an overall positive increase in value for the enterprise as a whole justifies proceeding with the change.

Potential value is uncertain value. There are always events or conditions that could increase or decrease the actual value if they occur. Many changes are proposed in terms of intangible or uncertain benefits, while costs are described as tangible, absolute, and might grow. When benefits are described as intangible and costs expressed as tangible, it may be difficult for decision makers to compare their options. Business analysts define a complete estimate of the purpose-driven and monetary effects of a proposed change by considering the tangible and intangible costs alongside the tangible and intangible benefits. The estimate of costs and benefits must take into account the degree of uncertainty pertaining at the time the estimates are made.

.4 Assess Design Options and Recommend Solution

Each design option is assessed based on the potential value it is expected to deliver. At any point in analyzing the design options, it may become necessary to re-evaluate the initial allocation of design elements between components. The

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reasons for re-evaluation include better understanding of the cost to implement each component and to determine which allocations have the best cost-to-benefit ratio.

As costs and effort are understood for each solution component, business analysts assess each design option to ensure that it represents the most effective trade-offs. There are several factors to take into consideration:

- **Available Resources**: there may be limitations regarding the amount of requirements that can be implemented based on the allocated resources. In some instances, a business case can be developed to justify additional investment.
- **Constraints on the Solution**: regulatory requirements or business decisions may require that certain requirements be handled manually or automatically, or that certain requirements be prioritized above all others.
- **Dependencies between Requirements**: some capabilities may in and of themselves provide limited value to the organization, but need to be delivered in order to support other high-value requirements.

Other considerations may include relationships with proposed vendors, dependencies on other initiatives, corporate culture, and sufficient cash flow for investment.

Business analysts recommend the option or options deemed to be the most valuable solution to address the need. It is possible that none of the design options are worthwhile and the best recommendation is to do nothing.

7.6.5 Guidelines and Tools

- **Business Objectives**: used to calculate the expected benefit.
- **Current State Description**: provides the context within which the work needs to be completed. It can be used to identify and help quantify the value to be delivered from a potential solution.
- **Future State Description**: describes the desired future state that the solution will be part of in order to ensure the design options are appropriate.
- **Risk Analysis Results**: the potential value of design options includes an assessment of the level of risk associated with the design options or initiative.
- **Solution Scope**: defines the scope of the solution that is being delivered so that a relevant evaluation can be made that is within the scope boundaries.

7.6.6 Techniques

- **Acceptance and Evaluation Criteria**: used to express requirements in the form of acceptance criteria to make them most useful when assessing proposed solutions and determining whether a solution meets the defined business needs.
- **Backlog Management**: used to sequence the potential value.

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- **Brainstorming**: used to identify potential benefits of the requirements in a collaborative manner.
- **Business Cases**: used to assess recommendations against business goals and objectives.
- **Business Model Canvas**: used as a tool to help understand strategy and initiatives.
- **Decision Analysis**: used to support the assessment and ranking of design options.
- **Estimation**: used to forecast the costs and efforts of meeting the requirements as a step towards estimating their value.
- **Financial Analysis**: used to evaluate the financial return of different options and choose the best possible return on investment.
- **Focus Groups**: used to get stakeholder input on which design options best meet the requirements, and to evaluate a targeted, small group of stakeholders' value expectations.
- **Interviews**: used to get stakeholder input on which design options best meet the requirements, and to evaluate individual stakeholders' value expectations.
- **Metrics and Key Performance Indicators (KPIs)**: used to create and evaluate the measurements used in defining value.
- **Risk Analysis and Management**: used to identify and manage the risks that could affect the potential value of the requirements.
- **Survey or Questionnaire**: used to get stakeholder input on which design options best meet the requirements, and to identify stakeholders' value expectations.
- **SWOT Analysis**: used to identify areas of strength and weakness that will impact the value of the solutions.
- **Workshops**: used to get stakeholder input on which design options best meet the requirements, and to evaluate stakeholders' value expectations.

7.6.7 Stakeholders

- **Customer**: represents the market segments affected by the requirements and solutions, and will be involved in analyzing the benefit of those requirements and costs of the design options.
- **Domain Subject Matter Expert**: may be called upon for their domain knowledge to assist in analyzing potential value and benefits, particularly for those requirements where they are harder to identify.
- **End User**: provides an insight into the potential value of the change.
- **Implementation Subject Matter Expert**: may be called upon for their expertise in implementing the design options in order to identify potential costs and risks.

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- **Project Manager**: manages the selection process so that when effecting the change they are aware of potential impacts on those supporting the change, including the risks associated with the change.
- **Regulator**: may be involved in risk evaluation concerning outside regulatory bodies or place constraints on the potential benefits.
- **Sponsor**: approves the expenditure of resources to purchase or develop a solution and approve the final recommendation. The sponsor will want to be kept informed of any changes in potential value or risk, as well as the resulting opportunity cost, as he/she may prefer another course of action.

7.6.8 Outputs

- **Solution Recommendation**: identifies the suggested, most appropriate solution based on an evaluation of all defined design options. The recommended solution should maximize the value provided to the enterprise.

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8 Solution Evaluation

The Solution Evaluation knowledge area describes the tasks that business analysts perform to assess the performance of and value delivered by a solution in use by the enterprise, and to recommend removal of barriers or constraints that prevent the full realization of the value.

While there may be some similarities to the activities performed in Strategy Analysis (p. 99), or Requirements Analysis and Design Definition (p. 133), an important distinction between the Solution Evaluation knowledge area and other knowledge areas is the existence of an actual solution. It may only be a partial solution, but the solution or solution component has already been implemented and is operating in some form. Solution Evaluation tasks that support the realization of benefits may occur before a change is initiated, while current value is assessed, or after a solution has been implemented.

Solution Evaluation tasks can be performed on solution components in varying stages of development:

- **Prototypes or Proofs of Concept**: working but limited versions of a solution that demonstrate value.
- **Pilot or Beta releases**: limited implementations or versions of a solution used in order to work through problems and understand how well it actually delivers value before fully releasing the solution.
- **Operational releases**: full versions of a partial or completed solution used to achieve business objectives, execute a process, or fulfill a desired outcome.

Solution Evaluation describes tasks that analyze the actual value being delivered, identifies limitations which may be preventing value from being realized, and

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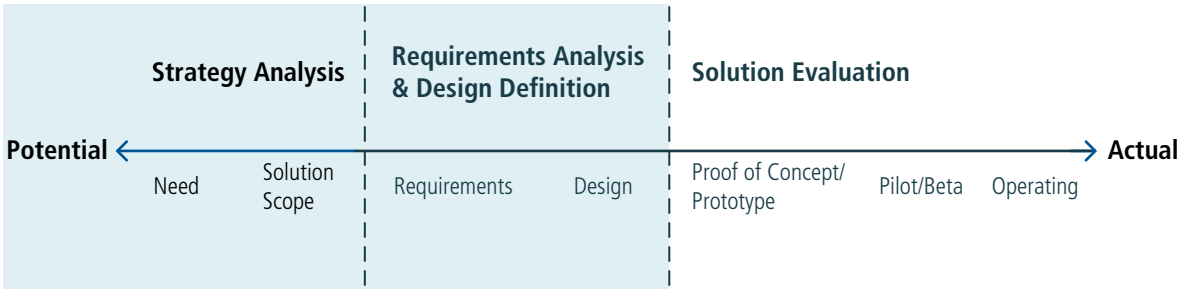
makes recommendations to increase the value of the solution. It may include any combination of performance assessments, tests, and experiments, and may combine both objective and subjective assessments of value. Solution Evaluation generally focuses on a component of an enterprise rather than the entire enterprise.

The following image illustrates the spectrum of value as business analysis activities progress from delivering potential value to actual value.

Figure 8.0.1: Business Analysis Value Spectrum



The Solution Evaluation knowledge area includes the following tasks:

- **Measure Solution Performance**: determines the most appropriate way to assess the performance of a solution, including how it aligns with enterprise goals and objectives, and performs the assessment.
- **Analyze Performance Measures**: examines information regarding the performance of a solution in order to understand the value it delivers to the enterprise and to stakeholders, and determines whether it is meeting current business needs.
- **Assess Solution Limitations**: investigates issues within the scope of a solution that may prevent it from meeting current business needs.
- **Assess Enterprise Limitations**: investigates issues outside the scope of a solution that may be preventing the enterprise from realizing the full value that a solution is capable of providing.
- **Recommend Actions to Increase Solution Value**: identifies and defines actions the enterprise can take to increase the value that can be delivered by a solution.

The Core Concept Model in Solution Evaluation

The *Business Analysis Core Concept Model*™ (*BACCM*™) describes the relationships among the six core concepts. The following table describes the usage and application of each of the core concepts within the context of Solution Evaluation.

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Table 8.0.1: : The Core Concept Model in Solution Evaluation

Core Concept	During Solution Evaluation, business analysts...
Change: the act of transformation in response to a need.	recommend a change to either a solution or the enterprise in order to realize the potential value of a solution.
Need: a problem or opportunity to be addressed.	evaluate how a solution or solution component is fulfilling the need.
Solution: a specific way of satisfying one or more needs in a context.	assess the performance of the solution, examine if it is delivering the potential value, and analyze why value may not be realized by the solution or solution component.
Stakeholder: a group or individual with a relationship to the change, the need, or the solution.	elicit information from the stakeholders about solution performance and value delivery.
Value: the worth, importance, or usefulness of something to a stakeholder within a context.	determine if the solution is delivering the potential value and examine why value may not be being realized.
Context: the circumstances that influence, are influenced by, and provide understanding of the change.	consider the context in determining solution performance measures and any limitations within the context that may prohibit value from being realized.

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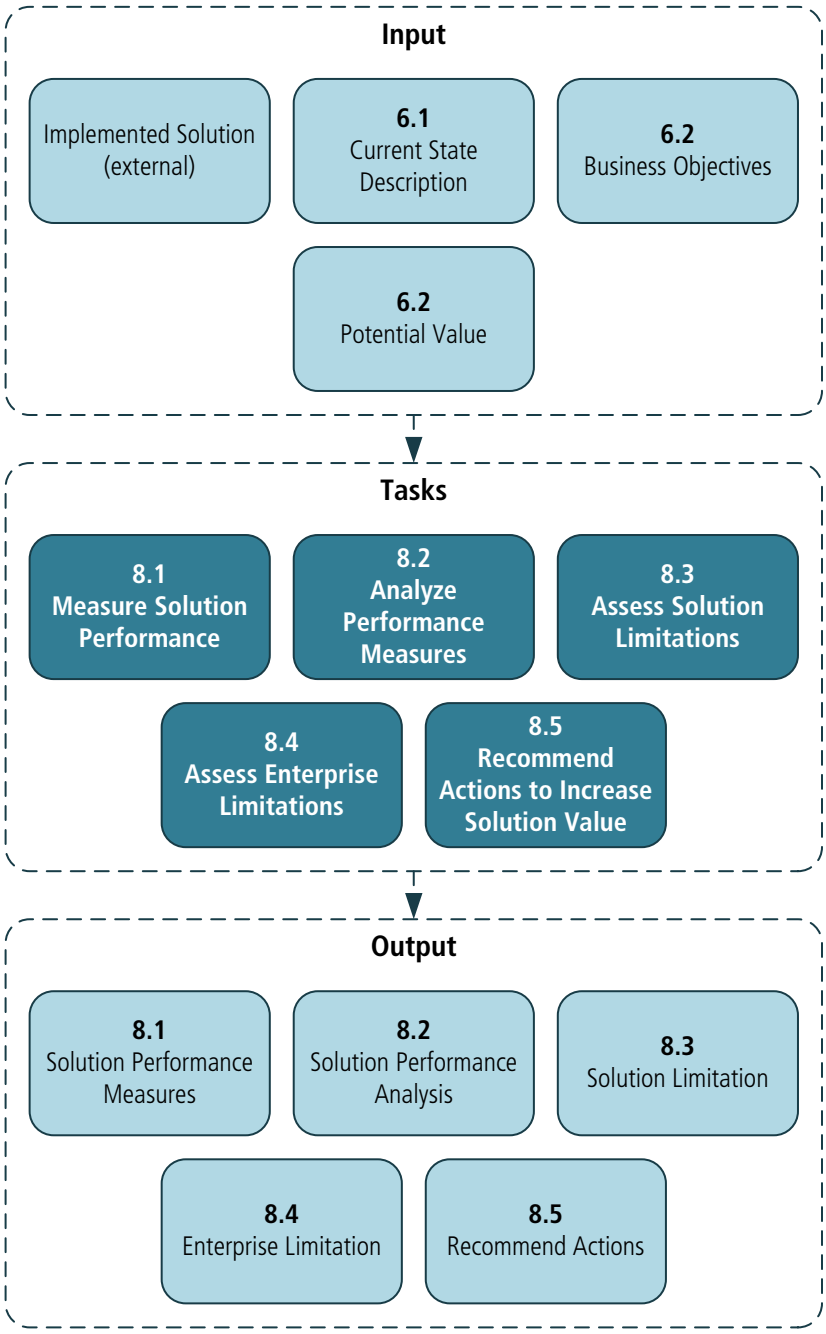
Figure 8.0.2: Solution Evaluation Input/Output Diagram



8.1 Measure Solution Performance

8.1.1 Purpose

The purpose of Measure Solution Performance is to define performance measures and use the data collected to evaluate the effectiveness of a solution in relation to the value it brings.

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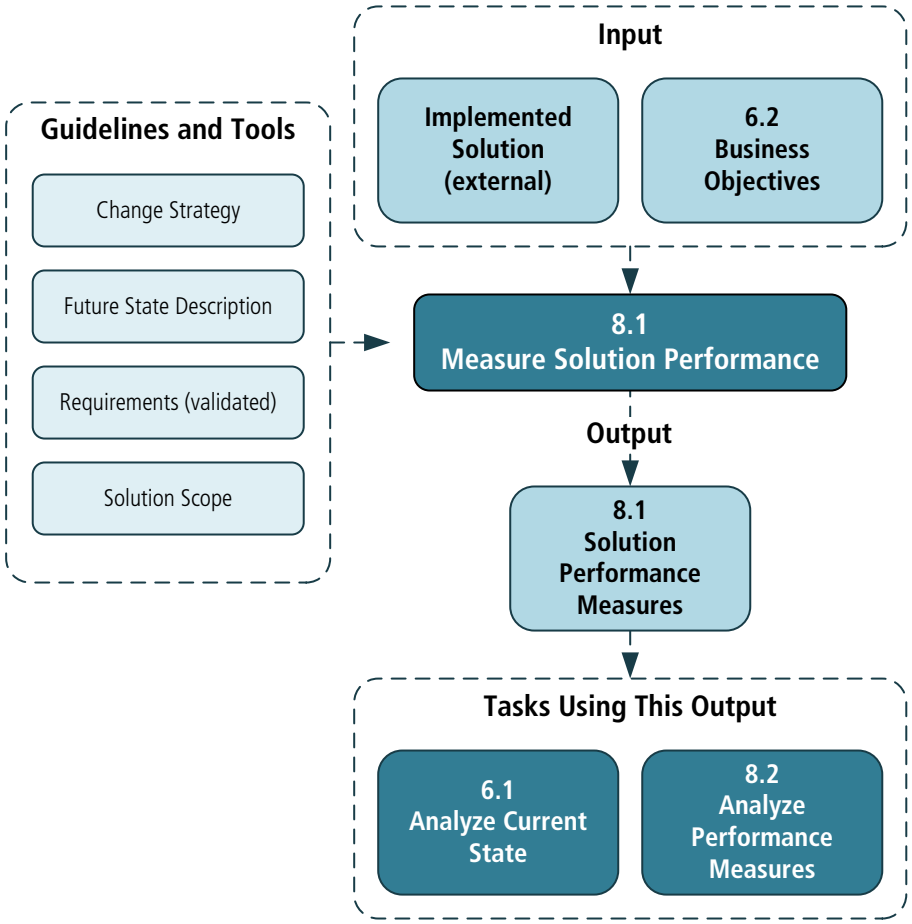
8.1.2 Description

Performance measures determine the value of a newly deployed or existing solution. The measures used depend on the solution itself, the context, and how the organization defines value. When solutions do not have built-in performance measures, the business analyst works with stakeholders to determine and collect the measures that will best reflect the performance of a solution. Performance may be assessed through key performance indicators (KPIs) aligned with enterprise measures, goals and objectives for a project, process performance targets, or tests for a software application.

8.1.3 Inputs

- **Business Objectives**: the measurable results that the enterprise wants to achieve. Provides a benchmark against which solution performance can be assessed.
- **Implemented Solution (external)**: a solution (or component of a solution) that exists in some form. It may be an operating solution, a prototype, or a pilot or beta solution.

Figure 8.1.1: Measure Solution Performance Input/Output Diagram



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8.1.4 Elements

.1 Define Solution Performance Measures

When measuring solution performance, business analysts determine if current measures exist, or if methods for capturing them are in place. Business analysts ensure that any existing performance measures are accurate, relevant and elicit any additional performance measures identified by stakeholders.

Business goals, objectives, and business processes are common sources of measures. Performance measures may be influenced or imposed by third parties such as solution vendors, government bodies, or other regulatory organizations. The type and nature of the measurements are considered when choosing the elicitation method. Solution performance measures may be quantitative, qualitative, or both, depending on the value being measured.

- **Quantitative Measures**: are numerical, countable, or finite, usually involving amounts, quantities, or rates.
- **Qualitative Measures**: are subjective and can include attitudes, perceptions, and any other subjective response. Customers, users, and others involved in the operation of a solution have perceptions of how well the solution is meeting the need.

.2 Validate Performance Measures

Validating performance measures helps to ensure that the assessment of solution performance is useful. Business analysts validate the performance measures and any influencing criteria with stakeholders. Specific performance measures should align with any higher-level measures that exist within the context affecting the solution. Decisions about which measures are used to evaluate solution performance often reside with the sponsor, but may be made by any stakeholder with decision-making authority.

.3 Collect Performance Measures

When defining performance measures, business analysts may employ basic statistical sampling concepts.

When collecting performance measures, business analysts consider:

- **Volume or Sample Size**: a volume or sample size appropriate for the initiative is selected. A sample size that is too small might skew the results and lead to inaccurate conclusions. Larger sample sizes may be more desirable, but may not be practical to obtain.
- **Frequency and Timing**: the frequency and timing with which measurements are taken may have an effect on the outcome.
- **Currency**: measurements taken more recently tend to be more representative than older data.

Using qualitative measures, business analysts can facilitate discussions to estimate the value realized by a solution. Stakeholders knowledgeable about the operation

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and use of the solution reach a consensus based on facts and reasonable assumptions, as perceived by them.

8.1.5 Guidelines and Tools

- **Change Strategy**: the change strategy used or in use to implement the potential value.
- **Future State Description**: boundaries of the proposed new, removed, or modified components of the enterprise, and the potential value expected from the future state.
- **Requirements (validated)**: a set of requirements that have been analyzed and appraised to determine their value.
- **Solution Scope**: the solution boundaries to measure and evaluate.

8.1.6 Techniques

- **Acceptance and Evaluation Criteria**: used to define acceptable solution performance.
- **Benchmarking and Market Analysis**: used to define measures and their acceptable levels.
- **Business Cases**: used to define business objectives and performance measures for a proposed solution.
- **Data Mining**: used to collect and analyze large amounts of data regarding solution performance.
- **Decision Analysis**: used to assist stakeholders in deciding on suitable ways to measure solution performance and acceptable levels of performance.
- **Focus Groups**: used to provide subjective assessments, insights, and impressions of a solution's performance.
- **Metrics and Key Performance Indicators (KPIs)**: used to measure solution performance.
- **Non-Functional Requirements Analysis**: used to define expected characteristics of a solution.
- **Observation**: used either to provide feedback on perceptions of solution performance or to reconcile contradictory results.
- **Prototyping**: used to simulate a new solution so that performance measures can be determined and collected.
- **Survey or Questionnaire**: used to gather opinions and attitudes about solution performance. Surveys and questionnaires can be effective when large or disparate groups need to be polled.
- **Use Cases and Scenarios**: used to define the expected outcomes of a solution.
- **Vendor Assessment**: used to assess which of the vendor's performance measures should be included in the solution's performance assessment.

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8.1.7 Stakeholders

- **Customer**: may be consulted to provide feedback on solution performance.
- **Domain Subject Matter Expert**: a person familiar with the domain who can be consulted to provide potential measurements.
- **End User**: contributes to the actual value realized by the solution in terms of solution performance. They may be consulted to provide reviews and feedback on areas such as workload and job satisfaction.
- **Project Manager**: responsible for managing the schedule and tasks to perform the solution measurement. For solutions already in operation, this role may not be required.
- **Sponsor**: responsible for approving the measures used to determine solution performance. May also provide performance expectations.
- **Regulator**: an external or internal group that may dictate or prescribe constraints and guidelines that must be incorporated into solution performance measures.

8.1.8 Outputs

- **Solution Performance Measures**: measures that provide information on how well the solution is performing or potentially could perform.

8.2 Analyze Performance Measures

8.2.1 Purpose

The purpose of Analyze Performance Measures is to provide insights into the performance of a solution in relation to the value it brings.

8.2.2 Description

The measures collected in the task Measure Solution Performance (p. 166) often require interpretation and synthesis to derive meaning and to be actionable. Performance measures themselves rarely trigger a decision about the value of a solution.

In order to meaningfully analyze performance measures, business analysts require a thorough understanding of the potential value that stakeholders hope to achieve with the solution. To assist in the analysis, variables such as the goals and objectives of the enterprise, key performance indicators (KPIs), the level of risk of the solution, the risk tolerance of both stakeholders and the enterprise, and other stated targets are considered.

8.2.3 Inputs

- **Potential Value**: describes the value that may be realized by implementing the proposed future state. It can be used as a benchmark against which solution performance can be evaluated.

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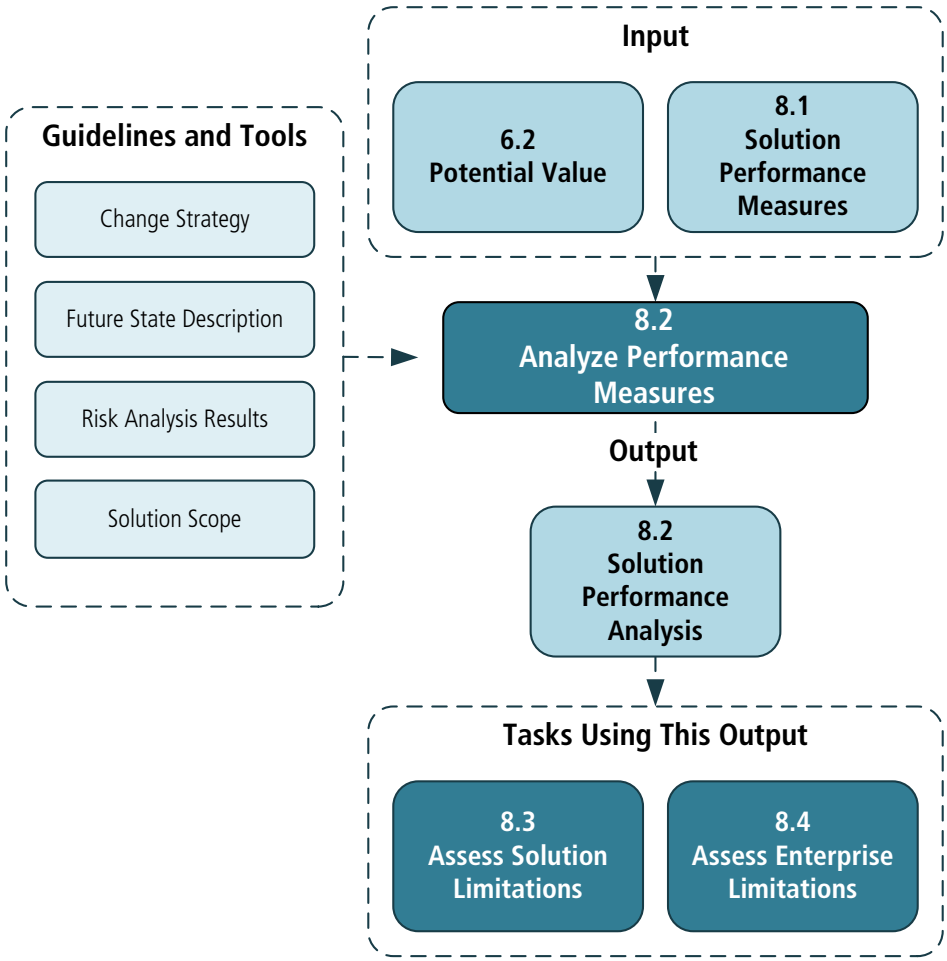
- **Solution Performance Measures**: measures and provides information on how well the solution is performing or potentially could perform.

Figure 8.2.1: Analyze Performance Measures Input/Output Diagram



8.2.4 Elements

.1 Solution Performance versus Desired Value

Business analysts examine the measures previously collected in order to assess their ability to help stakeholders understand the solution's value. A solution might be high performing, such as an efficient online transaction processing system, but contributes lower value than expected (or compared to what it had contributed in the past). On the other hand, a low performing but potentially valuable solution, such as a core process that is inefficient, can be enhanced to increase its performance level. If the measures are not sufficient to help stakeholders determine solution value, business analysts either collect more measurements or treat the lack of measures as a solution risk.

.2 Risks

Performance measures may uncover new risks to solution performance and to the enterprise. These risks are identified and managed like any other risks.

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.3 Trends

When analyzing performance data, business analysts consider the time period when the data was collected to guard against anomalies and skewed trends. A large enough sample size over a sufficient time period will provide an accurate depiction of solution performance on which to make decisions and guard against false signals brought about by incomplete data. Any pronounced and repeated trends, such as a noticeable increase in errors at certain times or a change in process speed when volume is increased, are noted.

.4 Accuracy

The accuracy of performance measures is essential to the validity of their analysis. Business analysts test and analyze the data collected by the performance measures to ensure their accuracy. To be considered accurate and reliable, the results of performance measures should be reproducible and repeatable.

.5 Performance Variances

The difference between expected and actual performance represents a variance that is considered when analyzing solution performance. Root cause analysis may be necessary to determine the underlying causes of significant variances within a solution. Recommendations of how to improve performance and reduce any variances are made in the task Recommend Actions to Increase Solution Value (p. 182).

8.2.5 Guidelines and Tools

- **Change Strategy**: the change strategy that was used or is in use to implement the potential value.
- **Future State Description**: boundaries of the proposed new, modified, or removed components of the enterprise and the potential value expected from the future state.
- **Risk Analysis Results**: the overall level of risk and the planned approach to modifying the individual risks.
- **Solution Scope**: the solution boundaries to measure and evaluate.

8.2.6 Techniques

- **Acceptance and Evaluation Criteria**: used to define acceptable solution performance through acceptance criteria. The degree of variance from these criteria will guide the analysis of that performance.
- **Benchmarking and Market Analysis**: used to observe the results of other organizations employing similar solutions when assessing risks, trends, and variances.
- **Data Mining**: used to collect data regarding performance, trends, common issues, and variances from expected performance levels and understand patterns and meaning in that data.

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- **Interviews**: used to determine expected value of a solution and its perceived performance from an individual or small group's perspective.
- **Metrics and Key Performance Indicators (KPIs)**: used to analyze solution performance, especially when judging how well a solution contributes to achieving goals.
- **Observation**: used to observe a solution in action if the data collected does not provide definitive conclusions.
- **Risk Analysis and Management**: used to identify, analyze, develop plans to modify the risks, and to manage the risks on an ongoing basis.
- **Root Cause Analysis**: used to determine the underlying cause of performance variance.
- **Survey or Questionnaire**: used to determine expected value of a solution and its perceived performance.

8.2.7 Stakeholders

- **Domain Subject Matter Expert**: can identify risks and provide insights into data for analyzing solution performance.
- **Project Manager**: within a project, responsible for overall risk management and may participate in risk analysis for new or changed solutions.
- **Sponsor**: can identify risks, provide insights into data and the potential value of a solution. They will make decisions about the significance of expected versus actual solution performance.

8.2.8 Outputs

- **Solution Performance Analysis**: results of the analysis of measurements collected and recommendations to solve performance gaps and leverage opportunities to improve value.

8.3 Assess Solution Limitations

8.3.1 Purpose

The purpose of Assess Solution Limitations is to determine the factors internal to the solution that restrict the full realization of value.

8.3.2 Description

Assessing solution limitations identifies the root causes for under-performing and ineffective solutions and solution components.

Assess Solution Limitations is closely linked to the task Assess Enterprise Limitations (p. 177). These tasks may be performed concurrently. If the solution

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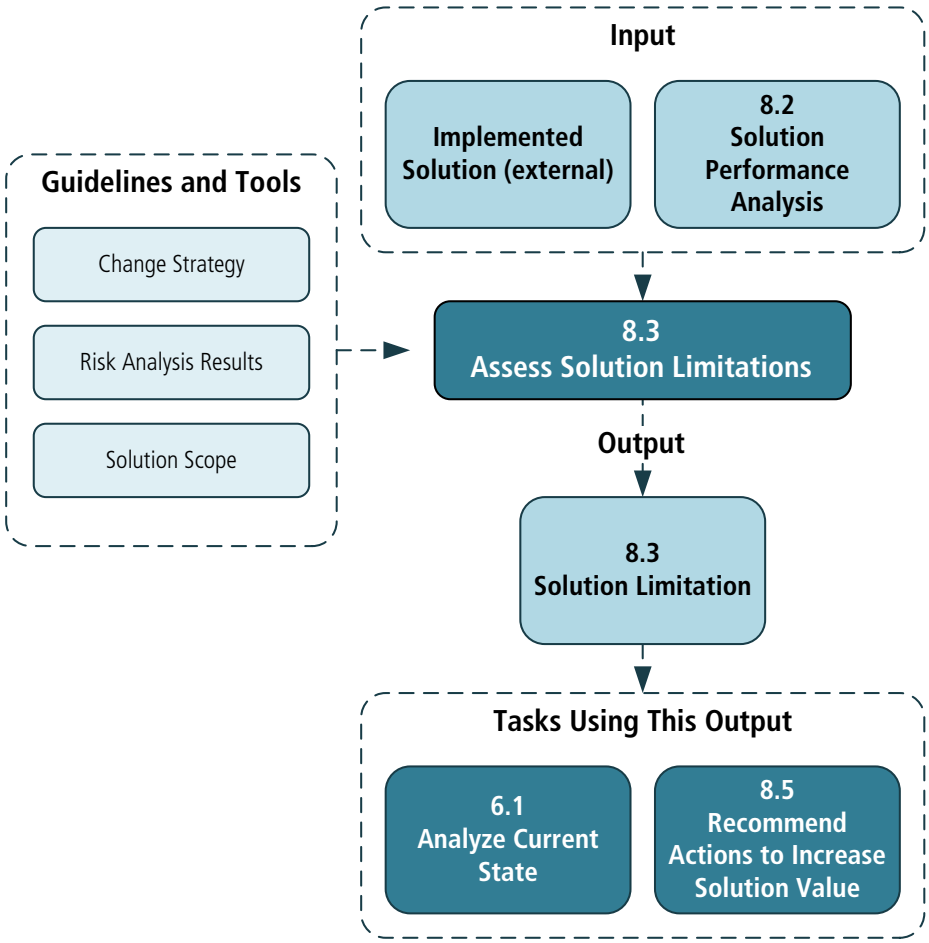
has not met its potential value, business analysts determine which factors, both internal and external to the solution, are limiting value. This task focuses on the assessment of those factors internal to the solution.

This assessment may be performed at any point during the solution life cycle. It may occur on a solution component during its development, on a completed solution prior to full implementation, or on an existing solution that is currently working within an organization. Regardless of the timing, the assessment activities are similar and involve the same considerations.

8.3.3 Inputs

- **Implemented Solution (external)**: a solution that exists. The solution may or may not be in operational use; it may be a prototype. The solution must be in use in some form in order to be evaluated.
- **Solution Performance Analysis**: results of the analysis of measurements collected and recommendations to solve for performance gaps and leverage opportunities to improve value.

Figure 8.3.1: Assess Solution Limitations Input/Output Diagram



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8.3.4 Elements

.1 Identify Internal Solution Component Dependencies

Solutions often have internal dependencies that limit the performance of the entire solution to the performance of the least effective component. Assessment of the overall performance of the solution or its components is performed in the tasks Measure Solution Performance (p. 166) and Analyze Performance Measures (p. 170). Business analysts identify solution components which have dependencies on other solution components, and then determine if there is anything about those dependencies or other components that limit solution performance and value realization.

.2 Investigate Solution Problems

When it is determined that the solution is consistently or repeatedly producing ineffective outputs, problem analysis is performed in order to identify the source of the problem.

Business analysts identify problems in a solution or solution component by examining instances where the outputs from the solution are below an acceptable level of quality or where the potential value is not being realized. Problems may be indicated by an inability to meet a stated goal, objective, or requirement, or may be a failure to realize a benefit that was projected during the tasks Define Change Strategy (p. 124) or Recommend Actions to Increase Solution Value (p. 182).

.3 Impact Assessment

Business analysts review identified problems in order to assess the effect they may have on the operation of the organization or the ability of the solution to deliver its potential value. This requires determining the severity of the problem, the probability of the re-occurrence of the problem, the impact on the business operations, and the capacity of the business to absorb the impact. Business analysts identify which problems must be resolved, which can be mitigated through other activities or approaches, and which can be accepted.

Other activities or approaches may include additional quality control measures, new or adjusted business processes, or additional support for exceptions to the desired outcome.

In addition to identified problems, business analysts assess risks to the solution and potential limitations of the solution. This risk assessment is specific to the solution and its limitations.

8.3.5 Guidelines and Tools

- **Change Strategy**: the change strategy used or in use to implement the potential value.

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- **Risks Analysis Results**: the overall level of risk and the planned approach to modifying the individual risks.
- **Solution Scope**: the solution boundaries to measure and evaluate.

8.3.6 Techniques

- **Acceptance and Evaluation Criteria**: used both to indicate the level at which acceptance criteria are met or anticipated to be met by the solution and to identify any criteria that are not met by the solution.
- **Benchmarking and Market Analysis**: used to assess if other organizations are experiencing the same solution challenges and, if possible, determine how they are addressing it.
- **Business Rules Analysis**: used to illustrate the current business rules and the changes required to achieve the potential value of the change.
- **Data Mining**: used to identify factors constraining performance of the solution.
- **Decision Analysis**: used to illustrate the current business decisions and the changes required to achieve the potential value of the change.
- **Interviews**: used to help perform problem analysis.
- **Item Tracking**: used to record and manage stakeholder issues related to why the solution is not meeting the potential value.
- **Lessons Learned**: used to determine what can be learned from the inception, definition, and construction of the solution to have potentially impacted its ability to deliver value.
- **Risk Analysis and Management**: used to identify, analyze, and manage risks, as they relate to the solution and its potential limitations, that may impede the realization of potential value.
- **Root Cause Analysis**: used to identify and understand the combination of factors and their underlying causes that led to the solution being unable to deliver its potential value.
- **Survey or Questionnaire**: used to help perform problem analysis.

8.3.7 Stakeholders

- **Customer**: is ultimately affected by a solution, and therefore has an important perspective on its value. A customer may be consulted to provide reviews and feedback.
- **Domain Subject Matter Expert**: provides input into how the solution should perform and identifies potential limitations to value realization.

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- **End User**: uses the solution, or is a component of the solution, and therefore contributes to the actual value realized by the solution in terms of solution performance. An end user may be consulted to provide reviews and feedback on areas such as workload and job satisfaction.
- **Regulator**: a person whose organization needs to be consulted about the planned and potential value of a solution, as that organization may constrain the solution, the degree to which actual value is realized, or when actual value is realized.
- **Sponsor**: responsible for approving the potential value of the solution, for providing resources to develop, implement and support the solution, and for directing enterprise resources to use the solution. The sponsor is also responsible for approving a change to potential value.
- **Tester**: responsible for identifying solution problems during construction and implementation; not often used in assessing an existing solution outside of a change.

8.3.8 Outputs

- **Solution Limitation**: a description of the current limitations of the solution including constraints and defects.

8.4 Assess Enterprise Limitations

8.4.1 Purpose

The purpose of Assess Enterprise Limitations is to determine how factors external to the solution are restricting value realization.

8.4.2 Description

Solutions may operate across various organizations within an enterprise, and therefore have many interactions and interdependencies. Solutions may also depend on environmental factors that are external to the enterprise. Enterprise limitations may include factors such as culture, operations, technical components, stakeholder interests, or reporting structures.

Assessing enterprise limitations identifies root causes and describes how enterprise factors limit value realization.

This assessment may be performed at any point during the solution life cycle. It may occur on a solution component during its development or on a completed solution prior to full implementation. It may also occur on an existing solution that is currently working within an organization. Regardless of the timing, the assessment activities are similar and require the same skills.

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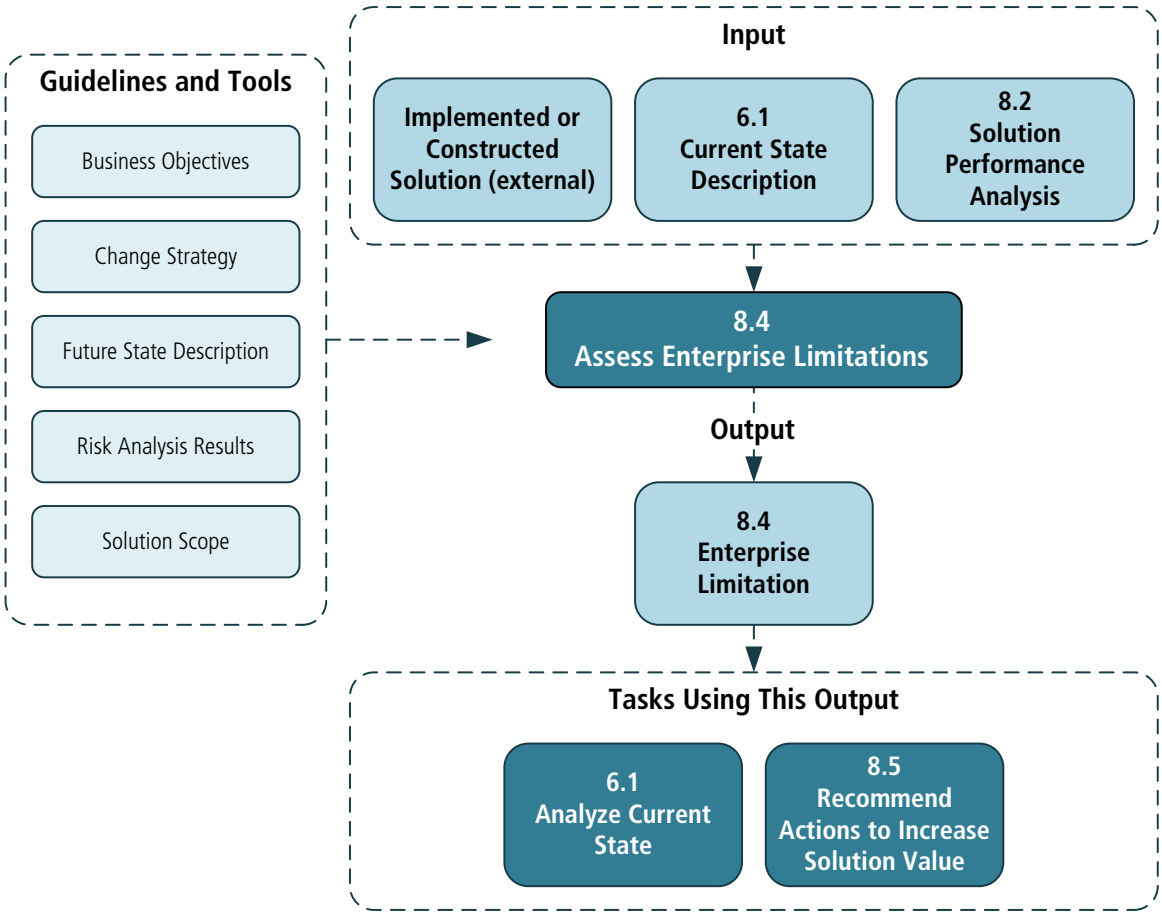
8.4.3 Inputs

- **Current State Description**: the current internal environment of the solution including the environmental, cultural, and internal factors influencing the solution limitations.
- **Implemented (or Constructed) Solution (external)**: a solution that exists. The solution may or may not be in operational use; it may be a prototype. The solution must be in use in some form in order to be evaluated.
- **Solution Performance Analysis**: results of the analysis of measurements collected and recommendations to solve performance gaps and leverage opportunities to improve value.

Figure 8.4.1: Assess Enterprise Limitations Input/Output Diagram



8.4.4 Elements

.1 Enterprise Culture Assessment

Enterprise culture is defined as the deeply rooted beliefs, values, and norms shared by the members of an enterprise. While these beliefs and values may not be directly visible, they drive the actions taken by an enterprise.

Business analysts perform cultural assessments to:

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- identify whether or not stakeholders understand the reasons why a solution exists,
- ascertain whether or not the stakeholders view the solution as something beneficial and are supportive of the change, and
- determine if and what cultural changes are required to better realize value from a solution.

The enterprise culture assessment evaluates the extent to which the culture can accept a solution. If cultural adjustments are needed to support the solution, the assessment is used to judge the enterprise's ability and willingness to adapt to these cultural changes.

Business analysts also evaluate internal and external stakeholders to:

- gauge understanding and acceptance of the solution,
- assess perception of value and benefit from the solution, and
- determine what communication activities are needed to ensure awareness and understanding of the solution.

.2 Stakeholder Impact Analysis

A stakeholder impact analysis provides insight into how the solution affects a particular stakeholder group.

When conducting stakeholder impact analysis, business analysts consider:

- **Functions**: the processes in which the stakeholder uses the solution, which include inputs a stakeholder provides into the process, how the stakeholder uses the solution to execute the process, and what outputs the stakeholder receives from the process.
- **Locations**: the geographic locations of the stakeholders interacting with the solution. If the stakeholders are in disparate locations, it may impact their use of the solution and the ability to realize the value of the solution.
- **Concerns**: the issues, risks, and overall concerns the stakeholders have with the solution. This may include the use of the solution, the perceptions of the value of the solution, and the impact the solution has on a stakeholder's ability to perform necessary functions.

.3 Organizational Structure Changes

There are occasions when business analysts assess how the organization's structure is impacted by a solution.

The use of a solution and the ability to adopt a change can be enabled or blocked by formal and informal relationships among stakeholders. The reporting structure may be too complex or too simple to allow a solution to perform effectively. Assessing if the organizational hierarchy supports the solution is a key activity. On occasion, informal relationships within an organization, whether alliances, friendships, or matrix-reporting, impact the ability of a solution to deliver

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potential value. Business analysts consider these informal relationships in addition to the formal structure.

.4 Operational Assessment

The operational assessment is performed to determine if an enterprise is able to adapt to or effectively use a solution. This identifies which processes and tools within the enterprise are adequately equipped to benefit from the solution, and if sufficient and appropriate assets are in place to support it.

When conducting an operational assessment, business analysts consider:

- policies and procedures,
- capabilities and processes that enable other capabilities,
- skill and training needs,
- human resources practices,
- risk tolerance and management approaches, and
- tools and technology that support a solution.

8.4.5 Guidelines and Tools

- **Business Objectives**: are considered when measuring and determining solution performance.
- **Change Strategy**: the change strategy used or in use to implement the potential value.
- **Future State Descriptions**: boundaries of the proposed new, removed, or modified components of the enterprise, as well as the potential value expected from the future state.
- **Risk Analysis Results**: the overall level of risk and the planned approach to modifying the individual risks.
- **Solution Scope**: the solution boundaries to measure and evaluate.

8.4.6 Techniques

- **Benchmarking and Market Analysis**: used to identify existing solutions and enterprise interactions.
- **Brainstorming**: used to identify organizational gaps or stakeholder concerns.
- **Data Mining**: used to identify factors constraining performance of the solution.
- **Decision Analysis**: used to assist in making an optimal decision under conditions of uncertainty and may be used in the assessment to make decisions about functional, technical, or procedural gaps.
- **Document Analysis**: used to gain an understanding of the culture, operations, and structure of the organization.

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- **Interviews**: used to identify organizational gaps or stakeholder concerns.
- **Item Tracking**: used to ensure that issues are not neglected or lost and that issues identified by assessment are resolved.
- **Lessons Learned**: used to analyze previous initiatives and the enterprise interactions with the solutions.
- **Observation**: used to witness the enterprise and solution interactions to identify impacts.
- **Organizational Modelling**: used to ensure the identification of any required changes to the organizational structure that may have to be addressed.
- **Process Analysis**: used to identify possible opportunities to improve performance.
- **Process Modelling**: used to illustrate the current business processes and/or changes that must be made in order to achieve the potential value of the solution.
- **Risk Analysis and Management**: used to consider risk in the areas of technology (if the selected technological resources provide required functionality), finance (if costs could exceed levels that make the change salvageable), and business (if the organization will be able to make the changes necessary to attain potential value from the solution).
- **Roles and Permissions Matrix**: used to determine roles and associated permissions for stakeholders, as well as stability of end users.
- **Root Cause Analysis**: used to determine if the underlying cause may be related to enterprise limitations.
- **Survey or Questionnaire**: used to identify organizational gaps or stakeholder concerns.
- **SWOT Analysis**: used to demonstrate how a change will help the organization maximize strengths and minimize weaknesses, and to assess strategies developed to respond to identified issues.
- **Workshops**: used to identify organizational gaps or stakeholder concerns.

8.4.7 Stakeholders

- **Customer**: people directly purchasing or consuming the solution who may interact with the organization in the use of the solution.
- **Domain Subject Matter Expert**: provides input into how the organization interacts with the solution and identifies potential limitations.
- **End User**: people who use a solution or who are a component of the solution. Users could be customers or people who work within the organization.
- **Regulator**: one or many governmental or professional entities that ensure adherence to laws, regulations, or rules; may have unique input to the organizational assessment, as relevant regulations must be included in the

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requirements. There may be laws and regulations that must be complied with prior to (or as a result of) a planned or implemented change.

- **Sponsor**: authorizes and ensures funding for a solution delivery, and champions action to resolve problems identified in the organizational assessment.

8.4.8 Outputs

- **Enterprise Limitation**: a description of the current limitations of the enterprise including how the solution performance is impacting the enterprise.

8.5 Recommend Actions to Increase Solution Value

8.5.1 Purpose

The purpose of Recommend Actions to Increase Solution Value is to understand the factors that create differences between potential value and actual value, and to recommend a course of action to align them.

8.5.2 Description

The various tasks in the Solution Evaluation knowledge area help to measure, analyze, and determine causes of unacceptable solution performance. The task Recommend Actions to Increase Solution Value (p. 182), focuses on understanding the aggregate of the performed assessments and identifying alternatives and actions to improve solution performance and increase value realization.

Recommendations generally identify how a solution should be replaced, retired, or enhanced. They may also consider long-term effects and contributions of the solution to stakeholders. They may include recommendations to adjust the organization to allow for maximum solution performance and value realization.

8.5.3 Inputs

- **Enterprise Limitation**: a description of the current limitations of the enterprise including how the solution performance is impacting the enterprise.
- **Solution Limitation**: a description of the current limitations of the solution including constraints and defects.

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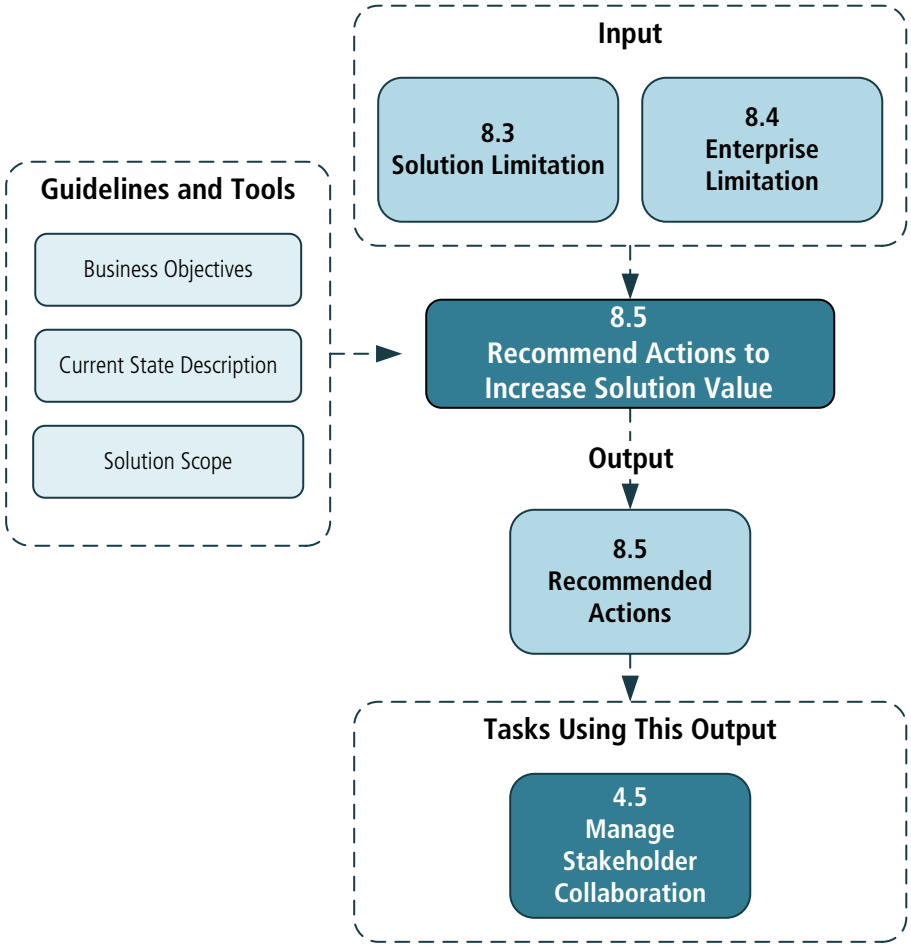
Figure 8.5.1: Recommend Actions to Increase Solution Value Input/Output Diagram



8.5.4 Elements

.1 Adjust Solution Performance Measures

In some cases, the performance of the solution is considered acceptable but may not support the fulfillment of business goals and objectives. An analysis effort to identify and define more appropriate measures may be required.

.2 Recommendations

While recommendations often describe ways to increase solution performance, this is not always the case. Depending on the reason for lower than expected performance, it may be reasonable to take no action, adjust factors that are external to the solution, or reset expectations for the solution.

Some common examples of recommendations that a business analyst may make include:

- **Do Nothing**: is usually recommended when the value of a change is low relative to the effort required to make the change, or when the risks of change significantly outweigh the risks of remaining in the current state. It

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may also be impossible to make a change with the resources available or in the allotted time frame.

- **Organizational Change**: is a process for managing attitudes about, perceptions of, and participation in the change related to the solution. Organizational change management generally refers to a process and set of tools for managing change at an organizational level. The business analyst may help to develop recommendations for changes to the organizational structure or personnel, as job functions may change significantly as the result of work being automated. New information may be made available to stakeholders and new skills may be required to operate the solution. Possible recommendations that relate to organizational change include:
  - automating or simplifying the work people perform. Relatively simple tasks are prime candidates for automation. Additionally, work activities and business rules can be reviewed and analyzed to determine opportunities for re-engineering, changes in responsibilities, and outsourcing.
  - improving access to information. Change may provide greater amounts of information and better quality of information to staff and decision makers.
- **Reduce Complexity of Interfaces**: interfaces are needed whenever work is transferred between systems or between people. Reducing their complexity can improve understanding.
- **Eliminate Redundancy**: different stakeholder groups may have common needs that can be met with a single solution, reducing the cost of implementation.
- **Avoid Waste**: the aim of avoiding waste is to completely remove those activities that do not add value and minimize those activities that do not contribute to the final product directly.
- **Identify Additional Capabilities**: solution options may offer capabilities to the organization above and beyond those identified in the requirements. In many cases, these capabilities are not of immediate value to the organization but have the potential to provide future value, as the solution may support the rapid development or implementation of those capabilities if they are required (for example, a software application may have features that the organization anticipates using in the future).
- **Retire the Solution**: it may be necessary to consider the replacement of a solution or solution component. This may occur because technology has reached the end of its life, services are being insourced or outsourced, or the solution is not fulfilling the goals for which it was created.
- Some additional factors that may impact the decision regarding the replacement or retirement of a solution include:
  - **ongoing cost versus initial investment**: it is common for the existing solution to have increasing costs over time, while alternatives have a higher investment cost upfront but lower maintenance costs.

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- **opportunity cost**: represents the potential value that could be realized by pursuing alternative courses of action.
- **necessity**: most solution components have a limited lifespan (due to obsolescence, changing market conditions, and other causes). After a certain point in the life cycle it will become impractical or impossible to maintain the existing component.
- **sunk cost**: describes the money and effort already committed to an initiative. The psychological impact of sunk costs may make it difficult for stakeholders to objectively assess the rationale for replacement or elimination, as they may feel reluctant to "waste" the effort or money already invested. As this investment cannot be recovered, it is effectively irrelevant when considering future action. Decisions should be based on the future investment required and the future benefits that can be gained.

8.5.5 Guidelines and Tools

- **Business Objectives**: are considered in evaluating, measuring, and determining solution performance.
- **Current State Description**: provides the context within which the work needs to be completed. It can be used to assess alternatives and better understand the potential increased value that could be delivered. It can also help highlight unintended consequences of alternatives that may otherwise remain undetected.
- **Solution Scope**: the solution boundaries to measure and evaluate.

8.5.6 Techniques

- **Data Mining**: used to generate predictive estimates of solution performance.
- **Decision Analysis**: used to determine the impact of acting on any of the potential value or performance issues.
- **Financial Analysis**: used to assess the potential costs and benefits of a change.
- **Focus Groups**: used to determine if solution performance measures need to be adjusted and used to identify potential opportunities to improve performance.
- **Organizational Modelling**: used to demonstrate potential change within the organization's structure.
- **Prioritization**: used to identify relative value of different actions to improve solution performance.
- **Process Analysis**: used to identify opportunities within related processes.
- **Risk Analysis and Management**: used to evaluate different outcomes under specific conditions.
- **Survey or Questionnaire**: used to gather feedback from a wide variety of stakeholders to determine if value has been met or exceeded, if the metrics are

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still valid or relevant in the current context, and what actions might be taken to improve the solution.

8.5.7 Stakeholders

- **Customer**: people directly purchasing or consuming the solution and who may interact with the organization in the use of the solution.
- **Domain Subject Matter Expert**: provides input into how to change the solution and/or the organization in order to increase value.
- **End User**: people who use a solution or who are a component of the solution. Users could be customers or people who work within the organization.
- **Regulator**: one or many governmental or professional entities that ensure adherence to laws, regulations, or rules. Relevant regulations must be included in requirements.
- **Sponsor**: authorizes and ensures funding for implementation of any recommended actions.

8.5.8 Outputs

- **Recommended Actions**: recommendation of what should be done to improve the value of the solution within the enterprise.

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9 Underlying Competencies

The Underlying Competencies chapter provides a description of the behaviours, characteristics, knowledge, and personal qualities that support the practice of business analysis.

The underlying competencies described here are not unique to business analysis. They are described here to ensure readers are aware of the range of fundamental skills required and provide a basis for them to further investigate the skills and knowledge that will enable them to be accomplished and adaptable business analysts.

These competencies are grouped into six categories:

- Analytical Thinking and Problem Solving (p. 188),
- Behavioural Characteristics (p. 194),
- Business Knowledge (p. 199),
- Communication Skills (p. 203),
- Interaction Skills (p. 207), and
- Tools and Technology (p. 211).

Each underlying competency is defined with a purpose, definition, and effectiveness measures.

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9.1 Analytical Thinking and Problem Solving

Analytical thinking and problem solving skills are required for business analysts to analyze problems and opportunities effectively, identify which changes may deliver the most value, and work with stakeholders to understand the impact of those changes.

Business analysts use analytical thinking by rapidly assimilating various types of information (for example, diagrams, stakeholder concerns, customer feedback, schematics, user guides, and spreadsheets), and identifying which are relevant. Business analysts should be able to quickly choose effective and adaptable methods to learn and analyze the media, audiences, problem types, and environments as each is encountered.

Business analysts utilize analytical thinking and problem solving as they facilitate understanding of situations, the value of proposed changes, and other complex ideas.

Possessing a sound understanding of the analytical thinking and problem solving core competencies allows business analysts to identify the best ways to present information to their stakeholders. For example, some concepts are more easily understood when presented in diagrams and information graphics rather than by paragraphs of text. Having this understanding assists business analysts when planning their business analysis approach and enables them to communicate business analysis information in a manner that suits the material being conveyed to their audience.

Analytical Thinking and Problem Solving core competencies include:

- Creative Thinking,
- Decision Making,
- Learning,
- Problem Solving,
- Systems Thinking,
- Conceptual Thinking, and
- Visual Thinking.

9.1.1 Creative Thinking

.1 Purpose

Thinking creatively and helping others to apply creative thinking helps business analysts to be effective in generating new ideas, approaches, and alternatives to problem solving and opportunities.

.2 Definition

Creative thinking involves generating new ideas and concepts as well as finding new or different associations between existing ideas and concepts. It helps

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overcome rigid approaches to problem solving by questioning conventional approaches and encouraging new ideas and innovations that are appropriate to the situation. Creative thinking may involve combining, changing, and reapplying existing concepts or ideas. Business analysts can be effective in promoting creative thinking in others by identifying and proposing alternatives, and by asking questions and challenging assumptions.

.3 Effectiveness Measures

Measures of effective creative thinking include:

- generating and productively considering new ideas,
- exploring concepts and ideas that are new,
- exploring changes to existing concepts and ideas,
- generating creativity for self and others, and
- applying new ideas to resolve existing problems.

9.1.2 Decision Making

.1 Purpose

Business analysts must be effective in understanding the criteria involved in making a decision, and in assisting others to make better decisions.

.2 Definition

When a business analyst or a group of stakeholders is faced with having to select an option from a set of alternatives, a decision must be made on which is the most advantageous for the stakeholders and the enterprise. Determining this involves gathering the information that is relevant to the decision, analyzing the relevant information, making comparisons and trade-offs between similar and dissimilar options, and identifying the most desirable option. Business analysts document decisions (and the rationale supporting those decisions) to use them as a reference in the event a similar decision is required in the future or if they are required to explain why a decision was made.

.3 Effectiveness Measures

Measures of effective decision making include:

- the appropriate stakeholders are represented in the decision-making process,
- stakeholders understand the decision-making process and the rationale behind the decision,
- the pros and cons of all available options are clearly communicated to stakeholders,
- the decision reduces or eliminates uncertainty, and any remaining uncertainty is accepted,

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- the decision made addresses the need or the opportunity at hand and is in the best interest of all stakeholders,
- stakeholders understand all the conditions, environment, and measures in which the decision will be made, and
- a decision is made.

9.1.3 Learning

.1 Purpose

The ability to quickly absorb new and different types of information and also modify and adapt existing knowledge allows business analysts to work effectively in rapidly changing and evolving environments.

.2 Definition

Learning is the process of gaining knowledge or skills. Learning about a domain passes through a set of stages, from initial acquisition and learning of raw facts, through comprehension of their meaning, to applying the knowledge in day-to-day work, and finally analysis, synthesis, and evaluation. Business analysts must be able to describe their level of understanding of the business domain and be capable of applying that level of understanding to determine which analysis activities need to be performed in a given situation. Once learning about a domain has reached the point where analysis is complete, business analysts must be able to synthesize the information to identify opportunities to create new solutions and evaluate those solutions to ensure that they are effective.

Learning is improved when the learning technique is selected based on the required learning outcomes.

Learning techniques to consider include:

- **Visual**: learning through the presentation of pictures, photographs, diagrams, models, and videos.
- **Auditory**: learning through verbal and written language and text.
- **Kinesthetic**: learning by doing.

Most people experience faster understanding and longer retention of information when more than one learning technique is used.

.3 Effectiveness Measures

Measures of effective learning include:

- understanding that learning is a process for all stakeholders,
- learning the concepts presented and then demonstrating an understanding of them,
- demonstrating the ability to apply concepts to new areas or relationships,
- rapidly absorbing new facts, ideas, concepts, and opinions, and

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- effectively presenting new facts, ideas, concepts, and opinions to others.

9.1.4 Problem Solving

.1 Purpose

Business analysts define and solve problems in order to ensure that the real, underlying root cause of a problem is understood by all stakeholders and that solution options address that root cause.

.2 Definition

Defining a problem involves ensuring that the nature of the problem and any underlying issues are clearly understood by all stakeholders. Stakeholder points of view are articulated and addressed to understand any conflicts between the goals and objectives of different groups of stakeholders. Assumptions are identified and validated. The objectives that will be met once the problem is solved are clearly specified, and alternative solutions are considered and possibly developed. Alternatives are measured against the objectives to determine which possible solution is best, and identify the value and trade-offs that may exist between solutions.

.3 Effectiveness Measures

Measures of effective problem solving include:

- confidence of the participants in the problem solving process,
- selected solutions meet the defined objectives and solve the root cause of the problem,
- new solution options can be evaluated effectively using the problem solving framework, and
- the problem solving process avoids making decisions based on unvalidated assumptions, preconceived notions, or other traps that may cause a sub-optimal solution to be selected.

9.1.5 Systems Thinking

.1 Purpose

Understanding how the people, processes, and technology within an organization interact allows business analysts to understand the enterprise from a holistic point of view.

.2 Definition

Systems theory and systems thinking suggest that a system as a whole has properties, behaviours, and characteristics that emerge from the interaction of the components of that system. These factors are not predictable from an understanding of the components alone. For example, just because a business

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analyst knows that a customer may return an item they purchased doesn't give the business analyst the full picture. The analyst must analyze the impact the return has on such items as inventory, finance, and store clerk training. In the context of systems theory, the term system includes the people involved, the interactions between them, the external forces affecting their behaviour, and all other relevant elements and factors.

.3 Effectiveness Measures

Measures of effective use of systems thinking include:

- communicating how a change to a component affects the system as a whole,
- communicating how a change to a system affects the environment it is in, and
- communicating how systems adapt to internal and/or external pressures and changes.

9.1.6 Conceptual Thinking

.1 Purpose

Business analysts routinely receive large amounts of detailed and potentially disparate information. They apply conceptual thinking skills to find ways to understand how that information fits into a larger picture and what details are important, and to connect seemingly abstract information.

.2 Definition

Conceptual thinking is about understanding the linkage between contexts, solutions, needs, changes, stakeholders, and value abstractly and in the big picture. It involves understanding and connecting information and patterns that may not be obviously related. Conceptual thinking involves understanding where details fit into a larger context. It involves using past experiences, knowledge, creativity, intuition, and abstract thinking to generate alternatives, options, and ideas that are not easily defined or related.

Conceptual thinking in business analysis is specifically about linking factors not easily defined to the underlying problem or opportunity, models, or frameworks that help stakeholders understand and facilitate themselves and others through change. It is needed to connect disparate information from a multitude of stakeholders, objectives, risks, details, and other factors. With this information it generates options and alternatives for a solution, and communicates this information to others while encouraging them to generate ideas of their own.

.3 Effectiveness Measures

Measures of effective conceptual thinking include:

- connecting disparate information and acting to better understand the relationship,

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- confirming the confidence and understanding of the concept being communicated with stakeholders,
- formulating abstract concepts using a combination of information and uncertainty, and
- drawing on past experiences to understand the situation.

9.1.7 Visual Thinking

.1 Purpose

The ability to communicate complex concepts and models into understandable visual representations allows business analysts to engage stakeholders and help them understand the concepts being presented.

.2 Definition

Visual thinking skills allow business analysts to create graphical representations of the concepts or systems being discussed. The goal of these graphical representations is to allow stakeholders to easily understand the concepts being presented, and then provide input. Visual thinking requires that the analyst make abstractions and then find suitable graphic devices to represent them.

Visual thinking is visualizing and creating simple visual concepts, graphics, models, diagrams, and constructs to convey and integrate non-visual information. In performing business analysis, large amounts of information and complex connections between contexts, stakeholders, needs, solutions, changes, and value are communicated. Visuals represent this information and its complexities, allowing stakeholders and audiences to learn more quickly, process the information, and connect points from each of their contexts.

Visual thinking also allows the audience to engage and connect concepts more quickly and freely into their context, as well as understand and appreciate others' contexts more clearly.

.3 Effectiveness Measures

Measures of effective visual thinking include:

- complex information is communicated in a visual model which is understandable by stakeholders,
- visuals allow for comparisons, pattern finding, and idea mapping with participants,
- productivity increases due to increased learning, quick memory, and follow through from effective visuals,
- stakeholders are engaged at a deeper level than with text alone, and
- stakeholders understand critical information which may have been missed if presented in textual content alone.

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9.2 Behavioural Characteristics

Behavioural characteristics are not unique to business analysis but they have been found to increase personal effectiveness in the practice of business analysis. These characteristics exist at the core of every business analyst's skill set. Each of the behavioural characteristics described here can impact the outcome of the practitioner's efforts.

The core competencies of behavioural characteristics focus on the skills and behaviours that allow a business analyst to gain the trust and respect of stakeholders. Business analysts do this by consistently acting in an ethical manner, completing tasks on time and to expectations, efficiently delivering quality results, and demonstrating adaptability to changing needs and circumstances.

Behavioural Characteristics core competencies include:

- Ethics (p. 194),
- Personal Accountability (p. 195),
- Trustworthiness (p. 195),
- Organization and Time Management (p. 196), and
- Adaptability (p. 197).

9.2.1 Ethics

.1 Purpose

Behaving ethically and thinking of ethical impacts on others allows business analysts to earn the respect of the stakeholders. The ability to recognize when a proposed solution or requirement may present ethical difficulties to an organization or its stakeholders is an important consideration that business analysts can use to help reduce exposure to risk.

.2 Definition

Ethics require an understanding and focus on fairness, consideration, and moral behaviour through business analysis activities and relationships. Ethical behaviour includes consideration of the impact that a proposed solution can have on all stakeholder groups and working to ensure that those groups are treated as fairly as possible. Fair treatment does not require that the outcome be beneficial to a particular stakeholder group, but it does require that the affected stakeholders understand the reasons for decisions. Awareness of ethical issues allows business analysts to identify when ethical dilemmas occur and recommend resolutions to these dilemmas.

.3 Effectiveness Measures

Measures of effective ethical behaviour include:

- prompt identification and resolution of ethical dilemmas,
- feedback from stakeholders confirming they feel decisions and actions are transparent and fair,

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- decisions made with consideration of the interests of all stakeholders,
- reasoning for decisions that is clearly articulated and understood,
- full and prompt disclosure of potential conflicts of interest, and
- honesty regarding one's abilities, the performance of one's work, and accepting responsibility for failures or errors.

9.2.2 Personal Accountability

.1 Purpose

Personal accountability is important for a business analyst because it ensures business analysis tasks are completed on time and to the expectations of colleagues and stakeholders. It enables the business analyst to establish credibility by ensuring that business analysis efforts meet the needs of the business.

.2 Description

Personal accountability includes effectively planning business analysis work to achieve targets and goals, and ensuring that value delivered is aligned with business needs. It involves chasing down all leads and loose ends to fully satisfy the stakeholder's needs. Following through on and fully completing business analysis tasks produces complete, accurate, and relevant solutions traceable to a need. Business analysts take responsibility for identifying and escalating risks and issues. They also ensure that decision makers have the appropriate information in order to assess impact.

.3 Effectiveness Measures

Measures of effective personal accountability include:

- work effort is planned and easily articulated to others,
- work is completed as planned or re-planned with sufficient reasoning and lead time,
- status of both planned and unplanned work is known,
- stakeholders feel that work is organized,
- risks and issues are identified and appropriately acted on,
- completely traceable requirements are delivered on time, and stakeholder needs are met.

9.2.3 Trustworthiness

.1 Purpose

Earning the trust of stakeholders helps business analysts elicit business analysis information around sensitive issues and enables them to help stakeholders have confidence that their recommendations will be evaluated properly and fairly.

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.2 Description

Trustworthiness is the perception that one is worthy of trust. A business analyst being considered trustworthy may offset the natural fear of change experienced by many stakeholders.

Several factors can contribute to being considered trustworthy:

- intentionally and consistently completing tasks and deliverables on time, within budget, and achieving expected results so that colleagues and stakeholders consider the business analyst's behaviour dependable and diligent,
- presenting a consistent attitude of confidence, so that colleagues and stakeholders consider the business analyst's demeanor as strong,
- acting in an honest and straightforward manner, addressing conflict and concerns immediately so that colleagues and stakeholders consider the business analyst's morals as being honest and transparent, and
- maintaining a consistent schedule over a long period of time so that colleagues and stakeholders consider the business analyst's availability predictable and reliable.

.3 Effectiveness Measures

Measures of effective trustworthiness include:

- stakeholders involve the business analyst in discussions and decision making,
- stakeholders bring issues and concerns to the business analyst,
- stakeholders are willing to discuss difficult or controversial topics with the business analyst,
- stakeholders do not blame the business analyst when problems occur,
- stakeholders respect the business analyst's ideas and referrals, and
- stakeholders respond to the business analyst's referrals with positive feedback.

9.2.4 Organization and Time Management

.1 Purpose

Organization and time management skills help business analysts perform tasks effectively and use work time efficiently.

.2 Description

Organization and time management involves the ability to prioritize tasks, perform them efficiently, and manage time effectively. Business analysts are constantly acquiring and accumulating significant quantities of information, and

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this information must be organized and stored in an efficient manner so that it can be used and reused at a later date. Business analysts must also be able to differentiate important information that should be retained from less important information.

Effective time management requires the ability to prioritize tasks and deadlines.

Techniques of organization include establishing short- and long-term goals, action plans, prioritizing tasks, and utilizing a checklist. Techniques for effective time management include establishing time limits on non-critical tasks, focusing more time on high risk and priority tasks, setting aside focus time, and managing potential interruptions.

.3 Effectiveness Measures

Measures of effective organization and time management include:

- the ability to produce deliverables in a timely manner,
- stakeholders feel that the business analyst focuses on the correct tasks at the right time,
- schedule of work effort and deadlines is managed and communicated to stakeholders,
- stakeholders feel their time in meetings and in reading communications is well spent,
- complete preparation for meetings, interviews, and requirements workshops,
- relevant business analysis information is captured, organized, and documented,
- adherence to the project schedule and the meeting of deadlines,
- provides accurate, thorough, and concise information in a logical manner which is understood by stakeholders, and
- maintains up-to-date information on the status of each work item and all outstanding work.

9.2.5 Adaptability

.1 Purpose

Business analysts frequently work in rapidly changing environments and with a variety of stakeholders. They adjust their behavioural style and method of approach to increase their effectiveness when interacting with different stakeholders, organizations, and situations.

.2 Definition

Adaptability is the ability to change techniques, style, methods, and approach. By demonstrating a willingness to interact with and complete tasks in a manner

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preferable to the stakeholders, business analysts can maximize the quality of service delivered and more efficiently help the organization achieve its goals and objectives. Having the curiosity to learn what others need and possessing the courage to try a different behaviour is adapting to situations and context.

Business analysts sometimes have to modify the way they interact with stakeholders, such as the way they conduct interviews or the way they facilitate workshops. Different stakeholders have different levels of comfort with techniques that are in the business analysis tool kit. Some stakeholders are more visual and respond better to information that is represented visually in models, diagrams, and pictures. Other stakeholders are more verbal and prefer textual descriptions. Being able to determine which techniques will work and which will not, and then adapt accordingly increases the likelihood of a successful interaction.

In the event that the goals and objectives of the organization change, business analysts respond by accepting the changes and adapting to a new mandate. Similarly, when circumstances arise or unanticipated problems occur, business analysts adapt by altering their plans and identifying options that can be used to deliver maximum value. The business analyst adapts when the business or stakeholder needs change, or when the context of the goal or the objective changes. When the need itself changes, the business analyst adapts by altering the plans and the approach in order to ensure that value is provided and delivered as part of the solution.

.3 Effectiveness Measures

Measures of effective adaptability include:

- demonstrating the courage to act differently from others,
- adapting to changing conditions and environments,
- valuing and considering other points of view and approaches,
- demonstrating a positive attitude in the face of ambiguity and change,
- demonstrating a willingness to learn new methods, procedures, or techniques in order to accomplish goals and objectives,
- changing behaviour to perform effectively under changing or unclear conditions,
- acquiring and applying new information and skills to address new challenges,
- acceptance of having changes made to tasks, roles and project assignments as organizational realities change,
- altering interpersonal style to highly diverse individuals and groups in a range of situations, and
- evaluating what worked, what did not, and what could be done differently next time.

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9.3 Business Knowledge

Business knowledge is required for the business analyst to perform effectively within their business, industry, organization, solution, and methodology. Business knowledge enables the business analyst to better understand the overarching concepts that govern the structure, benefits, and value of the situation as it relates to a change or a need.

Business Knowledge underlying competencies include:

- Business Acumen (p. 199),
- Industry Knowledge (p. 200),
- Organization Knowledge (p. 201),
- Solution Knowledge (p. 202), and
- Methodology Knowledge (p. 202).

9.3.1 Business Acumen

.1 Purpose

Business analysis requires an understanding of fundamental business principles and best practices in order to ensure they are considered as solutions are reviewed.

.2 Description

Business acumen is the ability to understand business needs using experience and knowledge obtained from other situations. Organizations frequently share similar practices, such as legal and regulatory requirements, finance, logistics, sales, marketing, supply chain management, human resources, and technology. Business acumen is the ability to understand and apply the knowledge based on these commonalities within differing situations.

Understanding how other organizations have solved challenges may be useful when seeking possible solutions. Being aware of the experiences or challenges encountered in the past may assist a business analyst in determining which information may be applicable to the current situation. Factors that may cause differences in practices can include industry, location, size of organization, culture, and the maturity of the organization.

.3 Effectiveness Measures

Measures of effective business acumen include:

- demonstrating the ability to recognize potential limitations and opportunities,
- demonstrating the ability to recognize when changes to a situation may require a change in the direction of an initiative or effort,

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- understanding the risks involved and the ability to make decisions on managing risks,
- demonstrating the ability to recognize an opportunity to decrease expenses and increase profits, and
- understanding the options available to address emerging changes in the situation.

9.3.2 Industry Knowledge

.1 Purpose

Industry knowledge provides the business analyst with an understanding of current practices and activities within an industry, and similar processes across industries.

.2 Description

Industry knowledge is an understanding of:

- current trends,
- market forces,
- market drivers,
- key processes,
- services,
- products,
- definitions,
- customer segments,
- suppliers,
- practices,
- regulations, and
- other factors that impact or are impacted by the industry and related industries.

Industry knowledge is also an understanding of how a company is positioned within an industry, and its impacts and dependencies, in regards to the market and human resources.

When developing knowledge about a particular industry, competitor, or company the following set of questions can provide guidance:

- Who are the top leaders in the industry?
- Which organizations promote or regulate the industry?
- What are the benefits of being involved with these organizations?
- Who is creating publicity releases, participating in conventions, and delivering marketing materials?
- What are the comparisons of products and services?
- What are the satisfaction indicators/benchmarking projects that are applicable?
- What are the suppliers, practices, equipment and tools used by each company, and why do they use them?

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- What are the potential impacts of weather, political unrest, or natural disasters?
- Who are the target customers and are they the same for the competition?
- What impacts the seasonal cycles for production, marketing, and sales? Does it impact staffing or require changes in processes?

.3 Effectiveness Measures

Measures of effective industry knowledge include:

- being aware of activities within both the enterprise and the broader industry,
- having knowledge of major competitors and partners,
- the ability to identify key trends shaping the industry,
- being familiar with the largest customer segments,
- having knowledge of common products and product types,
- being knowledgeable of sources of information about the industry, including relevant trade organizations or journals,
- understanding of industry specific terms, standards, processes and methodologies, and
- understanding of the industry regulatory environment.

9.3.3 Organization Knowledge

.1 Purpose

Organization knowledge provides an understanding of the management structure and business architecture of the enterprise.

.2 Definition

Organization knowledge includes an understanding of how the enterprise generates profits, accomplishes its goals, its organizational structure, the relationships that exist between business units, and the persons who occupy key stakeholder positions. Organization knowledge also includes understanding the organization's formal and informal communication channels as well as an awareness of the internal politics that influence decision making.

.3 Effectiveness Measures

Measures of effective organization knowledge include:

- the ability to act according to informal and formal communications and authority channels,
- understanding of terminology or jargon used in the organization,
- understanding of the products or services offered by the organization,

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- the ability to identify subject matter experts (SMEs) in the organization, and
- the ability to navigate organizational relationships and politics.

9.3.4 Solution Knowledge

.1 Purpose

Solution knowledge allows business analysts to leverage their understanding of existing departments, environments, or technology to efficiently identify the most effective means of implementing a change.

.2 Definition

When the business analysis effort involves improving an existing solution, business analysts apply knowledge and experience from the previous work on the solution. Familiarity with the range of commercially available solutions or suppliers can assist with the identification of possible alternatives. The business analyst may leverage knowledge gained from prior experiences to expedite the discovery of potential changes through elicitation or in-depth analysis.

.3 Effectiveness Measures

Measures of effective solution knowledge include:

- reduced time or cost to implement a required change,
- shortened time on requirements analysis and/or solution design,
- understanding when a larger change is, or is not, justified based on business benefit, and
- understanding how additional capabilities that are present, but not currently used, can be deployed to provide value.

9.3.5 Methodology Knowledge

.1 Purpose

Understanding the methodologies used by the organization provides the business analyst with information regarding context, dependencies, opportunities, and constraints used when developing a business analysis approach.

.2 Description

Methodologies determine the timing (big steps or small increments), the approach, the role of those involved, the accepted risk level, and other aspects of how a change is approached and managed. Organizations adopt or create their own methodologies to fit varying levels of culture, maturity, adaptability, risk, uncertainty, and governance.

Knowledge regarding a variety of methodologies allows the business analyst to quickly adapt to, and perform in, new environments.

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.3 Effectiveness Measures

Measures of effective methodology knowledge include:

- the ability to adapt to changes in methodologies,
- the willingness to use or learn a new methodology,
- the successful integration of business analysis tasks and techniques to support the current methodology,
- familiarity with the terms, tools, and techniques prescribed by a methodology, and
- the ability to play multiple roles within activities prescribed by a methodology.

9.4 Communication Skills

Communication is the act of a sender conveying information to a receiver in a method which delivers the meaning the sender intended. Active listening skills help to deepen understanding and trust between the sender and the receiver. Effective communication benefits all stakeholders.

Communication may be accomplished using a variety of delivery methods: verbal, non-verbal, physical, and written. Most communication methods deal with words, while some methods deal with movements and expressions. Words, gestures, and phrases may have different meanings to different individuals. Effective communication involves both the sender and receiver possessing the same understanding of the information being communicated. A shared glossary of terms and clear goals are effective tools to avoid misunderstandings and the resulting complications.

Effective communication includes adapting communication styles and techniques to the knowledge level and communication styles of recipients. Effective communicators understand how tone, body language, and context change the meaning of words. Gaining an understanding of the terms and concepts (prior to the exchange) can provide fruitful benefits.

Planning effective communication includes the sender reviewing the information that is known about the receiver. Differences between the sender and the receiver, such as native language, culture, motivations, priorities, communication, learning, and thinking styles may call for specific communication methods. Each piece of information must be carefully crafted and packaged to ensure it is clear and understood.

When planning to communicate information, the following considerations may be helpful:

- consider what the receiver knows or does not know,
- structure the information in a logical, comprehensible manner,
- determine how to best present the information to convey the intended

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meanings (for example, using visual aids, graphs, diagrams, or bullet points), and

- understand the expectations of the recipients.

Communication Skills core competencies include:

- Verbal Communication (p. 204),
- Non-Verbal Communication (p. 205),
- Written Communication (p. 205), and
- Listening (p. 206).

9.4.1 Verbal Communication

.1 Purpose

Business analysts use verbal communication to convey ideas, concepts, facts, and opinions to a variety of stakeholders.

.2 Description

Verbal communication uses spoken words to convey information from the sender to the receiver. Verbal communication skills are used to express business analysis information, ideas, concepts, facts, and opinions. It allows for the efficient transfer of information, including emotional and other non-verbal cues. It can be paired with both written and non-verbal communication.

Verbal communication deals specifically with the sender's choice of words and the tone of voice. When the receiver is able to see the sender, the sender's non-verbal communication impacts the meaning of the message being understood by the receiver. When the sender is able to see the receiver, the receiver is providing a response and both the sender and receiver are engaged in a dialogue, even though the receiver may not be speaking verbally. Monitoring the receiver's non-verbal communication allows the sender to consider adapting the message for the receiver.

Having an understanding of the tone of the communication and how it can positively or negatively influence the listener allows the business analyst to more effectively communicate verbally. Effective verbal communication skills include the ability to make one's meaning understood. The sender should partner verbal communication with active listening to ensure that information presented is being understood by the receiver.

.3 Effectiveness Measures

Measures of effective verbal communication include:

- restating concepts to ensure all stakeholders clearly understand the same information,
- assisting conversations to reach productive conclusions,

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- delivering effective presentations by designing and positioning content and objectives appropriately, and
- communicating an issue's important points in a calm and rational manner, and presenting solution options.

9.4.2 Non-Verbal Communication

.1 Purpose

Non-verbal communication skills enable the effective sending and receiving of messages through—but not limited to—body movement, posture, facial expressions, gestures, and eye contact.

.2 Definition

Communication is typically focused upon words that are written or spoken. Non-verbal communication, however, is believed to convey much more meaning than words alone. Moods, attitudes, and feelings impact body movement and facial expressions. Non-verbal communication begins immediately when one person is able to see another. The effective use of non-verbal communication skills can present a trustworthy, confident, and capable demeanor. Being aware of non-verbal communication provides the opportunity to be aware and address the feelings of others that are not expressed verbally.

Observing gestures or expressions cannot provide a complete understanding of the message being expressed by these non-verbal cues. These cues are indicators of the feelings and intent of the communicator. For example, when a stakeholder's non-verbal communication does not agree with their verbal message, the business analyst may want to explore the conversation further to uncover the source of this disagreement.

.3 Effectiveness Measures

Measures of effective non-verbal communication include:

- being aware of body language in others, but not assuming a complete understanding through non-verbal communication,
- intentional awareness of personal non-verbal communication,
- improving trust and communication as a result of non-verbal communication, and
- effectively addressing and resolving situations when a stakeholder's non-verbal communication does not agree with their verbal message.

9.4.3 Written Communication

.1 Purpose

Business analysts use written communication to to convey ideas, concepts, facts, and opinions to variety of stakeholders.

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.2 Definition

Written communication is the practice of using text, symbols, models (formal or informal), and sketches to convey and share information. An understanding of the audience is beneficial to effectively use written communication. Presenting information and ideas requires selecting the correct words so the audience will understand the intended meaning. Written communication has the added challenge of presenting information at a time or place that is remote from the time and place it was created.

Effective written communication requires a broad vocabulary, strong grasp of grammar and style, and an understanding of the terms which will be understood by the audience. Written communication has the potential to convey a great deal of information; however, conveying information effectively is a skill which must be developed.

.3 Effectiveness Measures

Measures of effective written communication include:

- adjusting the style of writing for the needs of the audience,
- proper use of grammar and style,
- choosing words the audience will understand the intended meaning of, and
- ability of the reader to paraphrase and describe the content of the written communication.

9.4.4 Listening

.1 Purpose

Effective listening allows the business analyst to accurately understand information that is communicated verbally.

.2 Definition

Listening is the process of not just hearing words but understanding their meaning in context. By exhibiting effective listening skills, business analysts not only have a greater opportunity to accurately understand what is being communicated, but also to demonstrate that they think what the speaker is saying is important.

Active listening involves both listening and interpreting what the other person is trying to communicate beyond the words used in order to understand the essence of the message. Active listening includes summarizing and repeating what was stated in different terms in order to ensure that both the listener and the speaker have the same understanding.

.3 Effectiveness Measures

Measures of effective listening include:

- giving the speaker undivided attention,

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- acknowledging the speaker with verbal or non-verbal encouragement,
- providing feedback to the person or the group that is speaking to ensure there is an understanding, and
- using active listening skills by deferring judgment and responding appropriately.

9.5 Interaction Skills

Interaction skills are represented by the business analyst's ability to relate, cooperate, and communicate with different kinds of people including executives, sponsors, colleagues, team members, developers, vendors, learning and development professionals, end users, customers, and subject matter experts (SMEs).

Business analysts are uniquely positioned to facilitate stakeholder communication, provide leadership, encourage comprehension of solution value, and promote stakeholder support of the proposed changes.

Interaction Skills core competencies include:

- Facilitation (p. 207),
- Leadership and Influencing (p. 208),
- Teamwork (p. 209),
- Negotiation and Conflict Resolution (p. 210), and
- Teaching (p. 210).

9.5.1 Facilitation

.1 Purpose

Business analysts facilitate interactions between stakeholders in order to help them make a decision, solve a problem, exchange ideas and information, or reach an agreement regarding the priority and the nature of requirements. The business analyst may also facilitate interactions between stakeholders for the purposes of negotiation and conflict resolution (as discussed in Negotiation and Conflict Resolution (p. 210)).

.2 Definition

Facilitation is the skill of moderating discussions within a group in order to enable all participants to effectively articulate their views on a topic under discussion, and to ensure that participants in the discussion are able to recognize and appreciate the differing points of view that are articulated.

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.3 Effectiveness Measures

Measures of effective facilitation include:

- making it clear to the participants that the facilitator is a third party to the process and not a decision maker nor the owner of the topic,
- encouraging participation from all attendees,
- remaining neutral and not taking sides, but at the same time being impartial and intervening when required in order to make suggestions and offer insights,
- establishing ground rules such as being open to suggestions, building on what is there, not dismissing ideas, and allowing others to speak and express themselves,
- ensuring that participants in a discussion correctly understand each other's positions,
- using meeting management skills and tools to keep discussions focused and organized,
- preventing discussions from being sidetracked onto irrelevant topics, and
- understanding and considering all parties' interests, motivations, and objectives.

9.5.2 Leadership and Influencing

.1 Purpose

Business analysts use leadership and influencing skills when guiding stakeholders during the investigation of business analysis information and solution options. They build consensus and encourage stakeholder support and collaboration during change.

.2 Definition

Leadership and influencing involves motivating people to act in ways that enable them to work together to achieve shared goals and objectives. Understanding the individual motives, needs, and capabilities of each stakeholder and how those can be effectively channeled assists business analysts in meeting the shared objectives of the organization. The business analyst's responsibility for defining, analyzing, and communicating business analysis information provides opportunities for leadership and influencing, whether or not there are people formally reporting to the business analyst.

.3 Effectiveness Measures

Measures of effective leadership and influencing include:

- reduced resistance to necessary changes,
- articulation of a clear and inspiring vision of a desired future state,
- success in inspiring others to turn vision into action,

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- influence on stakeholders to understand mutual interests,
- effective use of collaboration techniques to influence others,
- influence on stakeholders to consider broader objectives over personal motivations, and
- re-framing issues so alternate perspectives can be understood and accommodated to influence stakeholders towards shared goals.

9.5.3 Teamwork

.1 Purpose

Teamwork skills allow business analysts to work productively with team members, stakeholders, and any other vested partners so that solutions can be effectively developed and implemented.

.2 Definition

Business analysts often work as part of a team with other business analysts, project managers, stakeholders, and subject matter experts (SMEs). Relationships with people in those roles are a critical part of the success of any project or enterprise. It is important for the business analyst to understand how a team is formed and how it functions. Recognizing team dynamics and how they play a part as the team progresses through various stages of a project is also crucial. Knowing and adapting to how and when a team is progressing through a project's life cycle can lower the negative influences that impact a team.

Building and maintaining trust of teammates contributes to the integrity of the team as a whole and helps the team perform at its fullest capacity. When team members actively foster an environment for positive and trusting team dynamics, difficult decisions and challenges become less complicated.

Team conflict is common. If handled well, the resolution of conflict can benefit the team. Resolving conflict requires the team to focus on examining the positions, assumptions, observations, and expectations of all team members. Working through such problems can have the beneficial effect of strengthening the foundation of the analysis and the solution.

.3 Effectiveness Measures

Measures of effective teamwork include:

- fostering a collaborative working environment,
- effectively resolving conflict,
- developing trust among team members,
- support among the team for shared high standards of achievement, and
- promoting a shared sense of ownership of the team goals.

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9.5.4 Negotiation and Conflict Resolution

.1 Purpose

Business analysts occasionally mediate negotiations between stakeholders in order to reach a common understanding or an agreement. During this process, business analysts help resolve conflicts and differences of opinion with the intent of maintaining and strengthening working relationships among stakeholders and team members.

.2 Definition

Negotiation and conflict resolution involves mediating discussions between participants in order to help them recognize that there are differing views on the topic, resolve differences, and reach conclusions that have the agreement of all participants. Successful negotiation and conflict resolution includes identifying the underlying interests of the parties, distinguishing those interests from their stated positions, and helping the parties identify solutions that satisfy those underlying interests. The business analyst accomplishes this while ensuring that the outcome of the resolution aligns with the overall solution and the business needs.

.3 Effectiveness Measures

Measures of effective negotiation and conflict resolution include:

- a planned approach to ensure that the negotiation takes into account the tone of voice, the conveyed attitude, the methods used, and the concern for the other side's feelings and needs,
- the ability to recognize that the needs of the parties are not always in opposition and that it is often possible to satisfy both parties without either side losing,
- an objective approach to ensure the problem is separated from the person so that the real issues are debated without damaging working relationships, and
- the ability to recognize that effective negotiation and conflict resolution are not always achieved in a single autonomous meeting, and that sometimes several meetings are required in order to achieve the stated goals.

9.5.5 Teaching

.1 Purpose

Teaching skills help business analysts effectively communicate business analysis information, concepts, ideas, and issues. They also help ensure that information is understood and retained by stakeholders.

.2 Definition

Teaching is the process of leading others to gain knowledge. Business analysts are responsible for confirming that the information communicated has been

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understood by stakeholders. Business analysts lead stakeholders to discover clarity in ambiguity by helping them learn about the contexts and value of the needs being investigated. This requires teaching skills in selecting the most appropriate visual, verbal, written, and kinesthetic teaching approaches according to the information or techniques being taught. The intent is to draw out stakeholder engagement and collaborative learning to gain clarity. Business analysts frequently elicit and learn new information, and then teach this information to stakeholders in a meaningful way.

.3 Effectiveness Measures

Measures of effective teaching include:

- utilizing different methods to communicate information to be learned by stakeholders,
- discovering new information through high levels of stakeholder engagement,
- validating that audiences have a clear understanding of the key messages that are intended to be learned, and
- verifying that the stakeholders can demonstrate the new knowledge, facts, concepts, and ideas.

9.6 Tools and Technology

Business analysts use a variety of software applications to support communication and collaboration, create and maintain requirements artifacts, model concepts, track issues, and increase overall productivity.

Requirements documentation is often developed using word processing tools, while the process of developing business requirements may require the use of prototyping and simulation tools, as well as specialized tools for modelling and diagramming.

Requirements management technologies support requirements workflow, approvals, baselining, and change control. These technologies can also support the traceability between requirements and assist in determining the impact of changes to requirements.

Interacting with the stakeholders and team members may require the use of communication and collaboration tools, as well as presentation software in order to showcase ideas and generate discussion among stakeholders and team members.

Business Analysis Tools and Technology core competencies include:

- Office Productivity Tools and Technology (p. 212),
- Business Analysis Tools and Technology (p. 213), and
- Communication Tools and Technology (p. 215).

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9.6.1 Office Productivity Tools and Technology

.1 Purpose

Business analysts use office productivity tools and technology to document and track information and artifacts.

.2 Definition

Office productivity tools and technology provide business analysts with the ability to organize, dissect, manipulate, understand, and communicate information clearly. Utilizing these tools requires becoming familiar with available resources. Understanding one software program may provide insights into comparable abilities or operations in similar programs. Additionally, some programs are designed to provide additional tools to other programs or exchange information, such as e-mail or programs that can import/export files. Many organizations utilize these tools to study, store, and distribute information.

Office productivity tools and technology include the following:

- **Word processing and presentation programs**: provide the ability to present information in the form of a letter, newspaper, poster, research paper, slide presentation, or animations. Word processors are commonly used to develop and maintain requirements documents, allowing a great deal of control over their formatting and presentation. Standard requirements documentation templates are widely available for word processors. Most word processing tools have a limited capability to track changes and record comments, and are not designed for collaborative authoring; however, there are cloud solutions that provide collaborative functionality.
- **Presentation software**: serves in the creation of training materials or to present information to stimulate discussion among stakeholders. Some of these applications can be used in a very limited way to capture requirements or create a basic prototype.
- **Spreadsheets**: allow mathematical and logical manipulation. They are often used to maintain lists (such as atomic requirements, features, actions, issues, or defects). They are also used to capture and perform basic manipulation of numeric data. They can support decision analysis, and are very effective at summarizing complex scenarios. They support limited change tracking and can be shared among multiple users in the same way as a word processing document.
- **Communication tools (e-mail and instant messaging programs)**: provide the means to communicate with stakeholders who are remotely located, who cannot respond to queries immediately, or who may need a longer-term record of a discussion. They are generally available to almost all stakeholders and are very easy to use. However, they are generally not effective for long-term storage or retention of information. Their primary use is to facilitate communication over time or distance.
- **Collaboration and knowledge management tools**: support the capturing of knowledge distributed throughout an organization and make it as widely

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available as possible. They allow documents to be accessible by an entire team, and facilitate collaboration. They also enable multiple users to work on a document simultaneously, and generally support comments and discussion about document content. These tools may take the form of a document repository (which integrates with office productivity software), wikis (which allow easy creation and linking of web pages), discussion forums, cloud services, or other web-based tools.

- **Hardware**: allows for the replication and distribution of information to facilitate communication with stakeholders. Tools such as printers and digital projectors are often used to translate digital information generated on a computer into physical information for ease of use. Photocopiers and scanners copy physical documents and can provide the ability to share them electronically.

.3 Effectiveness Measures

Measures of effective office productivity tools and technology include:

- increased efficiencies and streamlining of processes by exploring features and functions of tools,
- awareness of available tools, their operation, and abilities,
- the ability to determine the tool that will best meet stakeholder needs, and
- the ability to clearly communicate the major features of available tools.

9.6.2 Business Analysis Tools and Technology

.1 Purpose

Business analysts use a variety of tools and technology to model, document, and manage outputs of business analysis activities and deliverables to stakeholders.

.2 Definition

Tools that are specific to the field of business analysis provide specialized capabilities in:

- modelling,
- diagramming,
- documenting,
- analyzing and mapping requirements,
- identifying relationships between requirements,
- tracking and storing requirements artifacts, and
- communicating with stakeholders.

Some business analysis tools and technologies focus solely on a single business analysis activity and some integrate multiple business analysis functions into a single tool. Tools specifically designed for business analysis may include such

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functionality as modelling, requirements management, issue tracking, prototyping and simulation, computer aided software engineering (CASE), and survey engines.

Modelling tools can provide functionality that assists business analysts with a number of modelling related tasks, including:

- creating models and visuals to help align stakeholders and outline the relationship of needs, entities, requirements, stakeholders, and context,
- tracing visuals to business rules, text requirements, scope statements, scope visuals, data requirements, product needs, and other requirements context and information, and
- creating an executable for a proprietary engine in order to execute the model or generate an application code which can be enhanced by a developer.

These tools frequently validate compliance with the notation. Some modelling tools support the creation of executable models, such as business process management systems (which allow for the creation of executable process models) and business rules management systems (which allow for the evaluation of captured business rules).

Requirements management technologies can provide functionality that assists business analysts with a number of requirements management related tasks including:

- requirements workflow including baselining, approvals and sign-off, change control, and implementation status,
- traceability including backwards traceability, forwards traceability, relationships between requirements, and impact analysis of requirements change,
- configuration management of requirements and requirements artifacts, and
- verifying the quality of requirements through checking for defined characteristics and relationships.

Issue tracking tools can provide functionality that assists business analysts with a number of issue tracking related tasks such as:

- tracking requirements risks,
- tracking requirements conflicts and issues, and
- tracking defects.

Prototyping and simulation tools can provide functionality that assists business analysts with prototyping or simulating the solution or pieces of the solution.

.3 Effectiveness Measures

Measures of effective business analysis tools and technology include:

- the ability to apply an understanding of one tool and other similar tools,

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- being able to identify major tools currently available and describe their strengths, weaknesses, and how they may be used in any given situation,
- understanding of and the ability to use the major features of the tool,
- ability to select a tool or tools that support organizational processes,
- the ability to use the tools to complete requirements-related activities more rapidly than otherwise possible, and
- the ability to track changes to the requirements and their impact on the solution implementation, stakeholders, and value.

9.6.3 Communication Tools and Technology

.1 Purpose

Business analysts use communication tools and technology to perform business analysis activities, manage teams, and collaborate with stakeholders.

.2 Definition

Communication tools are used to plan and complete tasks related to conversational interactions and collaborative interactions. Communication tools allow business analysts to work with virtual and co-located teams.

Understanding the options available with these tools—and knowing how to use various communications tools to complete tasks and utilize various techniques in a variety of collaboration environments—can enable more efficient and accurate communication and more effective decision making. Business analysts select the appropriate tool and technology for the situation and stakeholder group while balancing cost, risk, and value.

Examples of conversation interaction tools include voice communications, instant messaging, online chat, e-mail, blogging, and microblogging.

Examples of collaboration tools include video conferencing, electronic white boarding, wikis, electronic calendars, online brainstorming tools, electronic decision making, electronic voting, document sharing, and idea sharing.

.3 Effectiveness Measures

Measures of effective communication tools and technology include:

- the selection of appropriate and effective tools for the audience and purpose,
- effectively choosing when to use communication technology and when not to,
- the ability to identify tools to meet communication needs, and
- understanding of and the ability to use features of the tool.

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10 Techniques

The Techniques chapter provides a high-level overview of the techniques referenced in the Knowledge Areas of the *BABOK® Guide*. Techniques are methods business analysts use to perform business analysis tasks.

The techniques described in the *BABOK® Guide* are intended to cover the most common and widespread techniques practiced within the business analysis community. Business analysts apply their experience and judgment in determining which techniques are appropriate to a given situation and how to apply each technique. This may include techniques that are not described in the *BABOK® Guide*. As the practice of business analysis evolves, techniques will be added, changed, or removed from future iterations of the *BABOK® Guide*.

In a number of cases, a set of conceptually similar approaches have been grouped into a single technique. Any approach within a technique may be used individually or in combination to accomplish the technique's purpose.

10.1 Acceptance and Evaluation Criteria

10.1.1 Purpose

Acceptance criteria are used to define the requirements, outcomes, or conditions that must be met in order for a solution to be considered acceptable to key stakeholders. Evaluation criteria are the measures used to assess a set of requirements in order to choose between multiple solutions.

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10.1.2 Description

Acceptance and evaluation criteria define measures of value attributes to be used for assessing and comparing solutions and alternative designs. Measurable and testable criteria allow for the objective and consistent assessment of solutions and designs. The Acceptance and Evaluation Criteria technique can apply at all levels of a project, from high-level to a more detailed level.

Acceptance criteria describe the minimum set of requirements that must be met in order for a particular solution to be worth implementing. They may be used to determine if a solution or solution component can meet a requirement. Acceptance criteria are typically used when only one possible solution is being evaluated, and are generally expressed as a pass or fail.

Evaluation criteria define a set of measurements which allow for ranking of solutions and alternative designs according to their value for stakeholders. Each evaluation criterion represents a continuous or discrete scale for measuring a specific solution attribute such as cost, performance, usability, and how well the functionality represents the stakeholders' needs. Attributes that cannot be measured directly are evaluated using expert judgment or various scoring techniques.

Both evaluation and acceptance criteria may be defined with the same value attributes. When evaluating various solutions, the solutions with lower costs and better performance may be rated higher. When accepting a solution, the criteria are written using minimum performance requirements and maximum cost limits in contractual agreements and user acceptance tests.

10.1.3 Elements

.1 Value Attributes

Value attributes are the characteristics of a solution that determine or substantially influence its value for stakeholders. They represent a meaningful and agreed-upon decomposition of the value proposition into its constituent parts, which can be described as qualities that the solution should either possess or avoid.

Examples of value attributes include:

- ability to provide specific information,
- ability to perform or support specific operations,
- performance and responsiveness characteristics,
- applicability of the solution in specific situations and contexts,
- availability of specific features and capabilities, and
- usability, security, scalability, and reliability.

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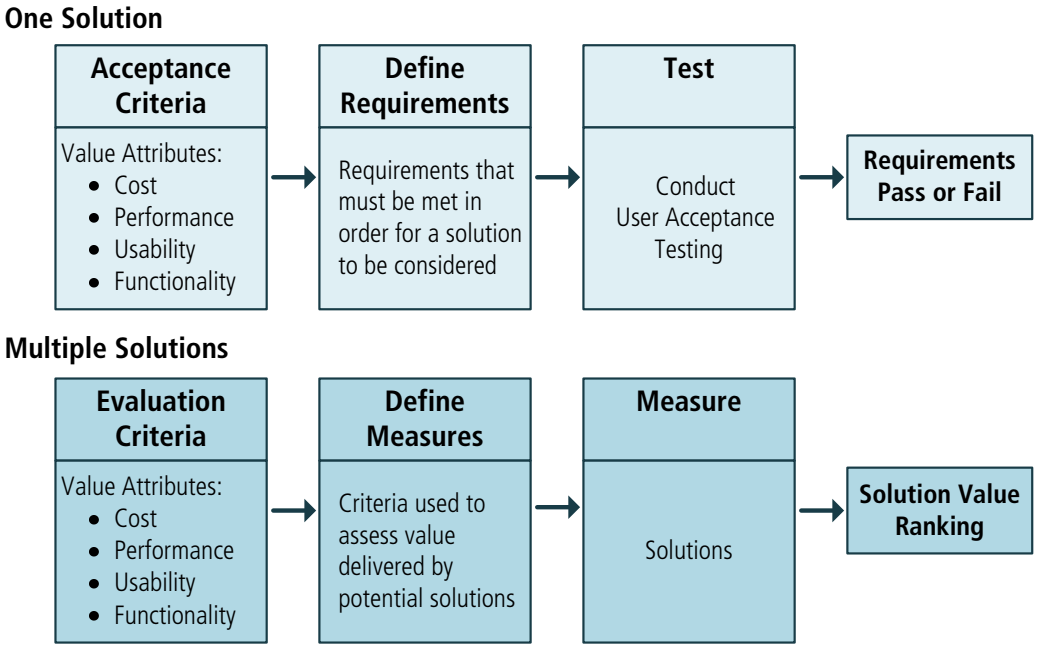
Basing acceptance and evaluation criteria on value attributes ensures that they are valid and relevant to stakeholder needs and should be considered when accepting and evaluating the solution. Business analysts ensure that the definition of all value attributes are agreed upon by all stakeholders. Business analysts may design tools and instructions for performing the assessment as well as for recording and processing its results.

Figure 10.1.1: Acceptance and Evaluation Criteria



.2 Assessment

In order to assess a solution against acceptance or evaluation criteria, it must be constructed in a measurable format.

Testability

Acceptance criteria are expressed in a testable form. This may require breaking requirements down into an atomic form so that test cases can be written to verify the solution against the criteria. Acceptance criteria are presented in the form of statements which can be verified as true or false. This is often achieved through user acceptance testing (UAT).

Measures

Evaluation criteria provide a way to determine if features provide the value necessary to satisfy stakeholder needs. The criteria are presented as parameters that can be measured against a continuous or discrete scale. The definition of each criterion allows the solution to be measured through various methods such as benchmarking or expert judgment. Defining evaluation criteria may involve designing tools and instructions for performing the assessment, as well as for recording and processing its results.

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10.1.4 Usage Considerations

.1 Strengths

- Agile methodologies may require that all requirements be expressed in the form of testable acceptance criteria.
- Acceptance criteria are necessary when the requirements express contractual obligations.
- Acceptance criteria provide the ability to assess requirements based on agreed-upon criteria.
- Evaluation criteria provide the ability to assess diverse needs based on agreed-upon criteria, such as features, common indicators, local or global benchmarks, and agreed ratios.
- Evaluation criteria assist in the delivery of expected return on investment (ROI) or otherwise specified potential value.
- Evaluation criteria helps in defining priorities.

.2 Limitations

- Acceptance criteria may express contractual obligations and as such may be difficult to change for legal or political reasons.
- Achieving agreement on evaluation criteria for different needs among diverse stakeholders can be challenging.

10.2 Backlog Management

10.2.1 Purpose

The backlog is used to record, track, and prioritize remaining work items.

10.2.2 Description

A backlog occurs when the volume of work items to be completed exceeds the capacity to complete them.

Backlog management refers to the planned approach to determine:

- what work items should be formally included in the backlog,
- how to describe the work items,
- how the work items should be tracked,
- how the work items should be periodically reviewed and prioritized in relation to all other items in the backlog,
- how the work items are eventually selected to be worked on, and
- how the work items are eventually removed from the backlog.

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In a managed backlog, the items at the top have the highest business value and the highest priority. These are normally the next items to be selected to be worked on.

Periodic review of the entire backlog should occur because changes in stakeholder needs and priorities may necessitate changes to the priority of some of the backlog items. In many environments, the backlog is reviewed at planned intervals.

The changes to the number of items in the backlog are regularly monitored. The root causes for these changes are investigated: a growing backlog could indicate an increase in demand or a drop in productivity; a declining backlog could indicate a drop in demand or improvements in the production process.

There may be more than one backlog. For example, one backlog may be used to manage a global set of items, while a second backlog may be used to manage the items that are due to be worked on within the very near future.

10.2.3 Elements

.1 Items in the Backlog

Backlog items may be any kind of item which may have work associated with it. A backlog may contain, but is not limited to, any combination of the following items:

- use cases,
- user stories,
- functional requirements,
- non-functional requirements,
- designs,
- customer orders,
- risk items,
- change requests,
- defects,
- planned rework,
- maintenance,
- conducting a presentation, or
- completing a document.

An item is added to the backlog if it has value to a stakeholder. There may be one person with the authority to add new items to the backlog, or there could be a committee which adds new items based on a consensus. In some cases, the responsibility for adding new items may be delegated to the business analyst. There may also be policies and rules which dictate what is to be added and when, as may be the case with major product defects.

.2 Prioritization

Items in the backlog are prioritized relative to each other. Over time, these priorities will change as stakeholders' priorities change, or as dependencies between backlog items emerge. Rules on how to manage the backlog may also impact priority.

A multi-phased prioritization approach can also be used. When items are first added to the backlog, the prioritization may be very broad, using categories such

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as high, medium, or low. The high priority items tend to be reviewed more frequently since they are likely candidates for upcoming work. To differentiate between the high priority items, a more granular approach is used to specify the relative priority to other high priority items, such as a numerical ranking based on some measure of value.

.3 Estimation

The level of detail used to describe each backlog item may vary considerably. Items near the top of the backlog are usually described in more detail, with a correspondingly accurate estimate about their relative size and complexity that would help to determine the cost and effort to complete them. When an item is first added, there may be very little detail included, especially if the item is not likely to be worked on in the near term.

A minimal amount of work is done on each item while it is on the backlog; just enough to be able to understand the work involved to complete it. As the work progresses on other items in the backlog, an individual item's relative priority may rise, leading to a need to review it and possibly further elaborate or decompose it to better understand and estimate its size and complexity.

Feedback from the production process about the cost and effort to complete earlier items can be used to refine the estimates of items still in the backlog.

.4 Managing Changes to the Backlog

Items make their way to the top of the backlog based on their relative priority to other items in the backlog. When new or changed requirements are identified, they are added to the backlog and ordered relative to the other items already there.

Whenever work capacity becomes available the backlog is reviewed and items are selected based on the available capacity, dependencies between items, current understanding of the size, and complexity.

Items are removed from the backlog when they are completed, or if a decision has been made to not do any more work on them. However, removed items can be re-added to the backlog for a variety of reasons, including:

- stakeholder needs could change significantly,
- it could be more time-consuming than estimated,
- other priority items could take longer to complete than estimated, or
- the resulting work product might have defects.

10.2.4 Usage Considerations

.1 Strengths

- An effective approach to responding to changing stakeholder needs and priorities because the next work items selected from the backlog are always

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aligned with current stakeholder priorities.

- Only items near the top of the backlog are elaborated and estimated in detail; items near the bottom of the backlog reflect lower priorities and receive less attention and effort.
- Can be an effective communication vehicle because stakeholders can understand what items are about to be worked on, what items are scheduled farther out, and which ones may not be worked on for some time.

.2 Limitations

- Large backlogs may become cumbersome and difficult to manage.
- It takes experience to be able to break down the work to be done into enough detail for accurate estimation.
- A lack of detail in the items in the backlog can result in lost information over time.

10.3 Balanced Scorecard

10.3.1 Purpose

The balanced scorecard is used to manage performance in any business model, organizational structure, or business process.

10.3.2 Description

The balanced scorecard is a strategic planning and management tool used to measure organizational performance beyond the traditional financial measures. It is outcome focused and provides a balanced view of an enterprise by implementing the strategic plan as an active framework of objectives and performance measures. The underlying premise of the balanced scorecard is that the drivers of value creation are understood, measured, and optimized in order to create sustainable performance.

The balanced scorecard is composed of four dimensions:

- Learning and Growth,
- Business Process,
- Customer, and
- Financial.

The balanced scorecard includes tangible objectives, specific measures, and targeted outcomes derived from an organization's vision and strategy. Balanced business scorecards can be used at multiple levels within an organization. This includes at an enterprise-wide level (macro level), departmental or function level, and even at the level of a project or initiative.

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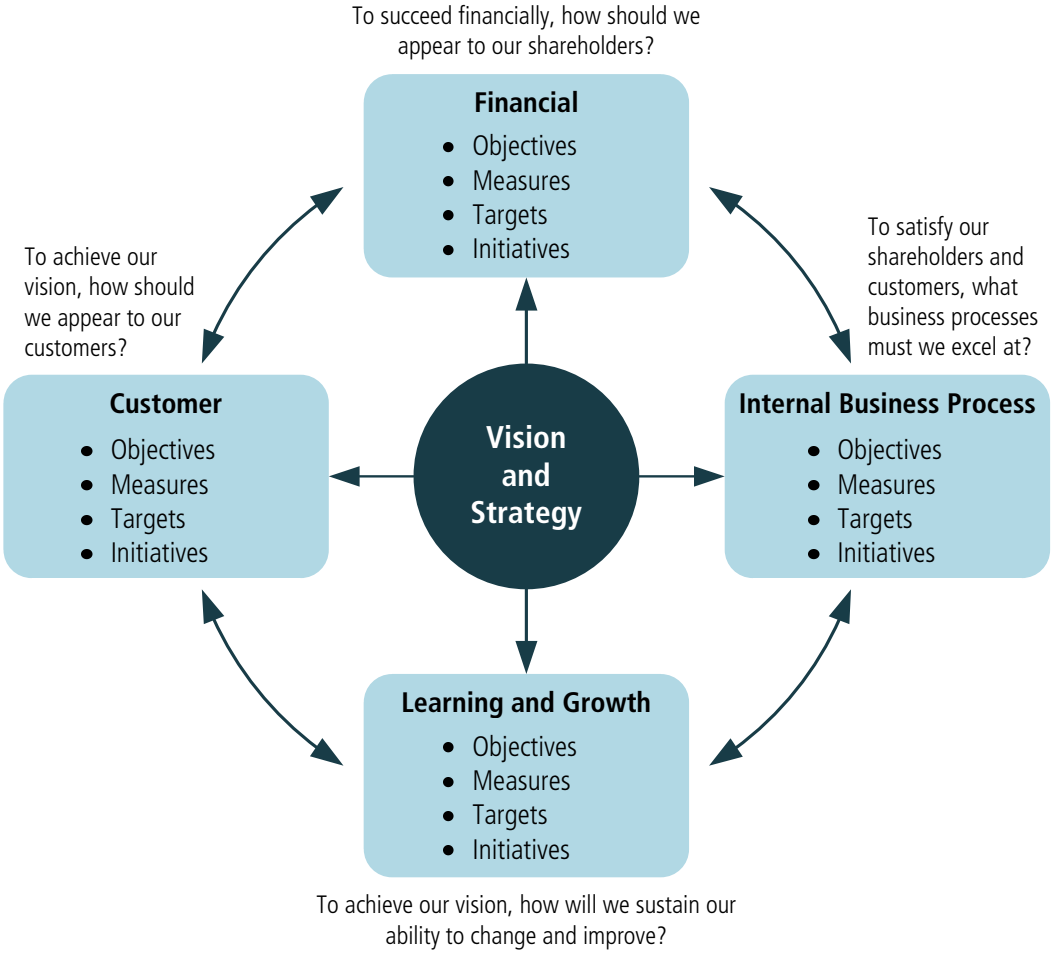
Figure 10.3.1: Balanced Scorecard



10.3.3 Elements

.1 Learning and Growth Dimension

The Learning and Growth dimension includes measures regarding employee training and learning, product and service innovation, and corporate culture. Metrics guide the use of training funds, mentoring, knowledge sharing, and technology improvements.

.2 Business Process Dimension

The Business Process dimension includes metrics that indicate how well the enterprise is operating and if their products meet customer needs.

.3 Customer Dimension

The Customer dimension includes metrics on customer focus, satisfaction and delivery of value. These metrics capture how well customer needs are met, how satisfied they are with products and services, whether the delivery of those products and services meet their quality expectations, and their overall experience with the enterprise.

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.4 Financial Dimension

The Financial dimension identifies what is financially necessary to realize the strategy. Examples of financial measures indicate profitability, revenue growth, and added economic value.

.5 Measures or Indicators

There are two basic types of measures or indicators: lagging indicators that provide results of actions already taken and leading indicators that provide information about future performance.

Objectives tend to have lagging indicators, but using related leading indicators can provide more real-time performance information.

10.3.4 Usage Considerations

In order for measures to be meaningful they should be quantitative, linked to strategy, and easily understood by all stakeholders. When defining measures, business analysts consider other relevant measures that are in place and ensure that any new or changed measures do not adversely impact any existing ones. At any time, any dimension of the balanced scorecard may be active, changing, and evolving. Each dimension affects and is affected by the others. The balanced scorecard allows the organization to establish monitoring and measuring of progress against objectives and to adapt strategy as needed.

Because scorecards are used to assess the performance of the enterprise or a business unit within the enterprise, changes to the measures can have wide reaching implications and must be clearly communicated and carefully managed.

.1 Strengths

- Facilitates holistic and balanced planning and thinking.
- Short-, medium-, and long-term goals can be harmonized into programs with incremental success measures.
- Strategic, tactical, and operational teams are more easily aligned in their work.
- Encourages forward thinking and competitiveness.

.2 Limitations

- A lack of a clear strategy makes aligning the dimensions difficult.
- Can be seen as the single tool for strategic planning rather than just one tool to be used in a suite of strategic planning tools.
- Can be misinterpreted as a replacement for strategic planning, execution, and measurement.

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10.4 Benchmarking and Market Analysis

10.4.1 Purpose

Benchmarking and market analysis are conducted to improve organizational operations, increase customer satisfaction, and increase value to stakeholders.

10.4.2 Description

Benchmark studies are conducted to compare organizational practices against the best-in-class practices. Best practices may be found in competitor enterprises, in government, or from industry associations. The objective of benchmarking is to evaluate enterprise performance and ensure that the enterprise is operating efficiently. Benchmarking may also be performed against standards for compliance purposes. The results from the benchmark study may initiate change within an organization.

Market analysis involves researching customers in order to determine the products and services that they need or want, the factors that influence their decisions to purchase, and the competitors that exist in the market. The objective of market analysis is to acquire this information in order to support the various decision-making processes within an organization. Market analysis can also help determine when to exit a market. It may be used to determine if partnering, merging, or divesting are viable alternatives for an enterprise.

10.4.3 Elements

.1 Benchmarking

Benchmarking includes:

- identifying the areas to be studied,
- identifying enterprises that are leaders in the sector (including competitors),
- conducting a survey of selected enterprises to understand their practices,
- using a Request for Information (RFI) to gather information about capabilities,
- arranging visits to best-in-class organizations,
- determining gaps between current and best practices, and
- developing a project proposal to implement best practices.

.2 Market Analysis

Market Analysis requires that business analysts:

- identify customers and understand their preferences,
- identify opportunities that may increase value to stakeholders,
- identify competitors and investigate their operations,

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- look for trends in the market, anticipate growth rate, and estimate potential profitability,
- define appropriate business strategies,
- gather market data,
- use existing resources such as company records, research studies, and books and apply that information to the questions at hand, and
- review data to determine trends and draw conclusions.

10.4.4 Usage Considerations

.1 Strengths

- Benchmarking provides organizations with information about new and different methods, ideas, and tools to improve organizational performance.
- An organization may use benchmarking to identify best practices by its competitors in order to meet or exceed its competition.
- Benchmarking identifies why similar companies are successful and what processes they used to become successful.
- Market analysis can target specific groups and can be tailored to answer specific questions.
- Market analysis may expose weaknesses within a certain company or industry.
- Market analysis may identify differences in product offerings and services that are available from a competitor.

.2 Limitations

- Benchmarking is time-consuming; organizations may not have the expertise to conduct the analysis and interpret useful information.
- Benchmarking cannot produce innovative solutions or solutions that will produce a sustainable competitive advantage because it involves assessing solutions that have been shown to work elsewhere with the goal of reproducing them.
- Market analysis can be time-consuming and expensive, and the results may not be immediately available.
- Without market segmentation, market analysis may not produce the expected results or may provide incorrect data about a competitor's products or services.

10.5 Brainstorming

10.5.1 Purpose

Brainstorming is an excellent way to foster creative thinking about a problem. The aim of brainstorming is to produce numerous new ideas, and to derive from them themes for further analysis.

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10.5.2 Description

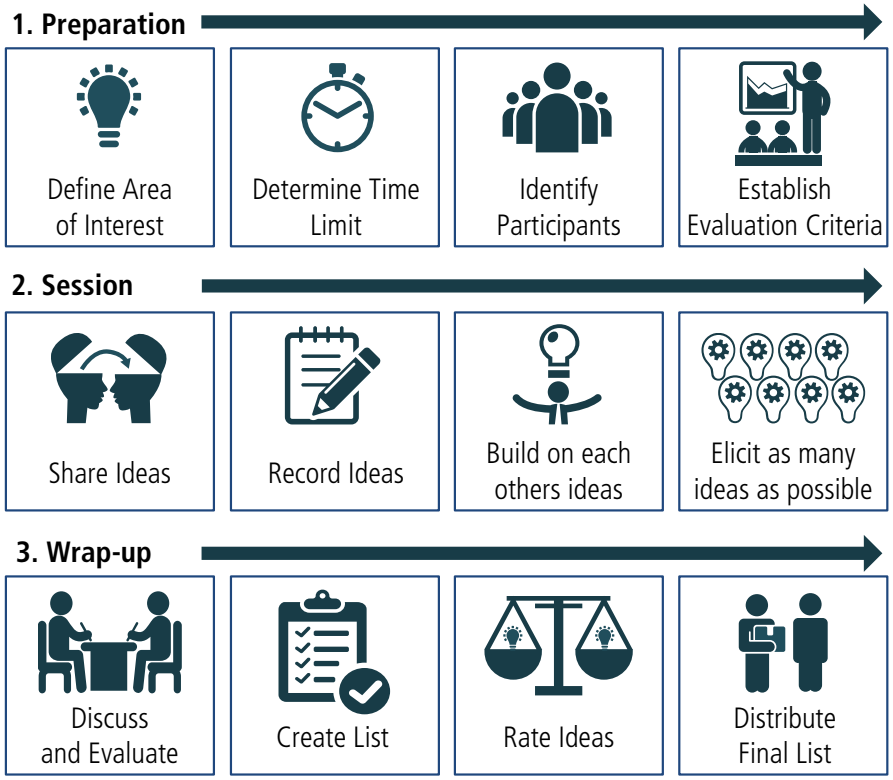
Brainstorming is a technique intended to produce a broad or diverse set of options.

It helps answer specific questions such as (but not limited to):

- What options are available to resolve the issue at hand?
- What factors are constraining the group from moving ahead with an approach or option?
- What could be causing a delay in activity 'A'?
- What can the group do to solve problem 'B'?

Brainstorming works by focusing on a topic or problem and then coming up with many possible solutions to it. This technique is best applied in a group as it draws on the experience and creativity of all members of the group. In the absence of a group, one could brainstorm on one's own to spark new ideas. To heighten creativity, participants are encouraged to use new ways of looking at things and freely associate in any direction. When facilitated properly, brainstorming can be fun, engaging, and productive.

Figure 10.5.1: Brainstorming



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10.5.3 Elements

.1 Preparation

- Develop a clear and concise definition of the area of interest.
- Determine a time limit for the group to generate ideas; the larger the group, the more time required.
- Identify the facilitator and participants in the session (aim for six to eight participants who represent a range of backgrounds and experience with the topic).
- Set expectations with participants and get their buy-in to the process.
- Establish the criteria for evaluating and rating the ideas.

.2 Session

- Share new ideas without any discussion, criticism, or evaluation.
- Visibly record all ideas.
- Encourage participants to be creative, share exaggerated ideas, and build on the ideas of others.
- Don't limit the number of ideas as the goal is to elicit as many as possible within the time period.

.3 Wrap-up

- Once the time limit is reached, discuss and evaluate the ideas using the predetermined evaluation criteria.
- Create a condensed list of ideas, combine ideas where appropriate, and eliminate duplicates.
- Rate the ideas, and then distribute the final list of ideas to the appropriate parties.

10.5.4 Usage Considerations

.1 Strengths

- Ability to elicit many ideas in a short time period.
- Non-judgmental environment enables creative thinking.
- Can be useful during a workshop to reduce tension between participants.

.2 Limitations

- Participation is dependent on individual creativity and willingness to participate.
- Organizational and interpersonal politics may limit overall participation.
- Group participants must agree to avoid debating the ideas raised during brainstorming.

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10.6 Business Capability Analysis

10.6.1 Purpose

Business capability analysis provides a framework for scoping and planning by generating a shared understanding of outcomes, identifying alignment with strategy, and providing a scope and prioritization filter.

10.6.2 Description

Business capability analysis describes what an enterprise, or part of an enterprise, is able to do. Business capabilities describe the ability of an enterprise to act on or transform something that helps achieve a business goal or objective. Capabilities may be assessed for performance and associated risks to identify specific performance gaps and prioritize investments. Many product development efforts are an attempt to improve the performance of an existing business capability or to deliver a new one. As long as an enterprise continues to perform similar functions, the capabilities required by the enterprise should remain constant—even if the method of execution for those capabilities undergoes significant change.

10.6.3 Elements

.1 Capabilities

Capabilities are the abilities of an enterprise to perform or transform something that helps achieve a business goal or objective. Capabilities describe the purpose or outcome of the performance or transformation, not how the performance or transformation is performed. Each capability is found only once on a capability map, even if it is possessed by multiple business units.

.2 Using Capabilities

Capabilities impact value through increasing or protecting revenue, reducing or preventing cost, improving service, achieving compliance, or positioning the company for the future. Not all capabilities have the same level of value. There are various tools that can be used to make value explicit in a capability assessment.

.3 Performance Expectations

Capabilities can be assessed to identify explicit performance expectations. When a capability is targeted for improvement, a specific performance gap can be identified. The performance gap is the difference between the current performance and the desired performance, given the business strategy.

.4 Risk Model

Capabilities alone do not have risks—the risks are in the performance of the capability, or in the lack of performance.

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These risks fall into the usual business categories:

- business risk,
- technology risk,
- organizational risk, and
- market risk.

.5 Strategic Planning

Business capabilities for the current state and future state of an enterprise can be used to determine where that enterprise needs to go in order to accomplish its strategy. A business capability assessment can produce a set of recommendations or proposals for solutions. This information forms the basis of a product roadmap and serves as a guide for release planning. At the strategic level, capabilities should support an enterprise in establishing and maintaining a sustainable competitive advantage and a distinct value proposition.

.6 Capability Maps

Capability maps provide a graphical view of elements involved in business capability analysis. The following examples demonstrate one element of a capability map that would be part of a larger capabilities grid.

There is no set standard for the notation of capabilities maps. The following images show two different methods for creating a capability map. The first two images are the first example and the third image is the second example.

Figure 10.6.1: Sample Capability Map Example 1 Cell

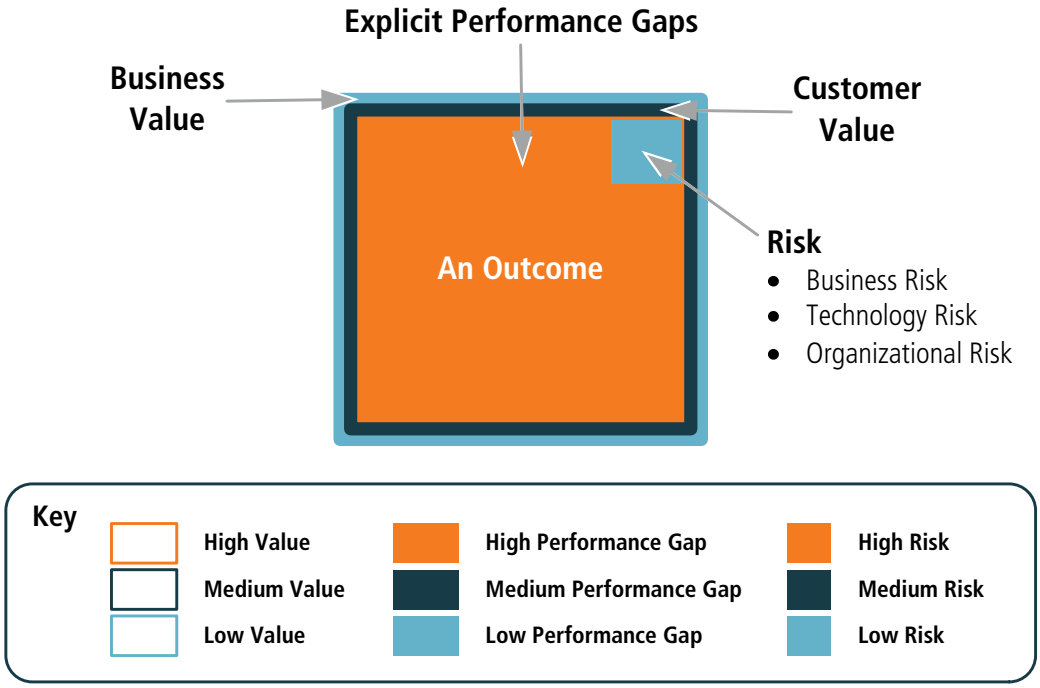

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Figure 10.6.2: Sample Capability Map Example 1

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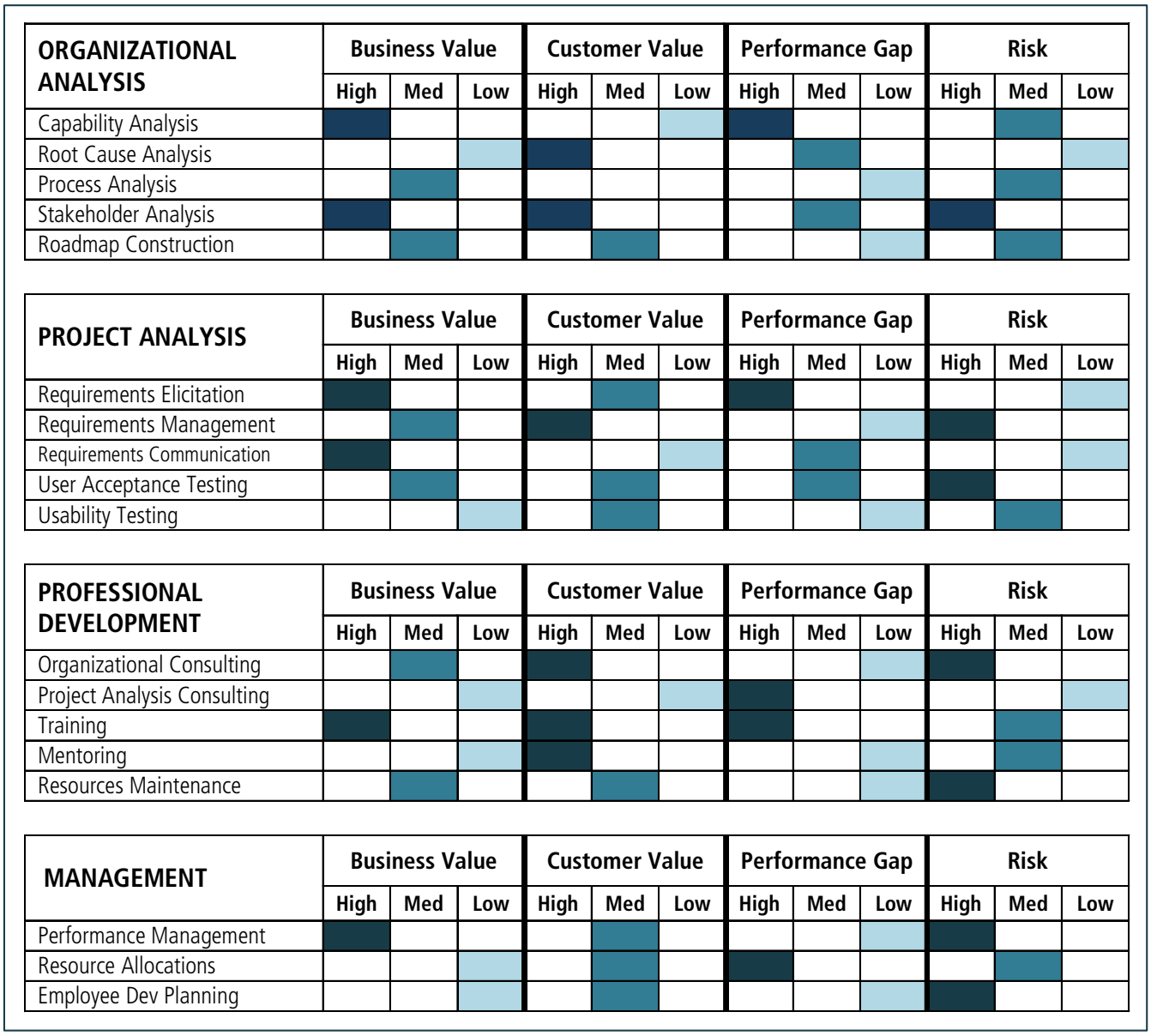
Figure 10.6.3: Sample Capability Map Example 2



ORGANIZATIONAL ANALYSIS	Business Value			Customer Value			Performance Gap			Risk		
	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low
Capability Analysis												
Root Cause Analysis												
Process Analysis												
Stakeholder Analysis												
Roadmap Construction												

PROJECT ANALYSIS	Business Value			Customer Value			Performance Gap			Risk		
	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low
Requirements Elicitation												
Requirements Management												
Requirements Communication												
User Acceptance Testing												
Usability Testing												

PROFESSIONAL DEVELOPMENT	Business Value			Customer Value			Performance Gap			Risk		
	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low
Organizational Consulting												
Project Analysis Consulting												
Training												
Mentoring												
Resources Maintenance												

MANAGEMENT	Business Value			Customer Value			Performance Gap			Risk		
	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low
Performance Management												
Resource Allocations												
Employee Dev Planning												

10.6.4 Usage Considerations

.1 Strengths

- Provides a shared articulation of outcomes, strategy, and performance, which help create very focused and aligned initiatives.
- Helps align business initiatives across multiple aspects of the organization.
- Useful when assessing the ability of an organization to offer new products and services.

.2 Limitations

- Requires an organization to agree to collaborate on this model.

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- When created unilaterally or in a vacuum it fails to deliver on the goals of alignment and shared understanding.
- Requires a broad, cross–functional collaboration in defining the capability model and the value framework.

10.7 Business Cases

10.7.1 Purpose

A business case provides a justification for a course of action based on the benefits to be realized by using the proposed solution, as compared to the cost, effort, and other considerations to acquire and live with that solution.

10.7.2 Description

A business case captures the rationale for undertaking a change. A business case is frequently presented in a formal document, but may also be presented through informal methods. The amount of time and resources spent on the business case should be proportional to the size and importance of its potential value. The business case provides sufficient detail to inform and request approval without providing specific intricacies about the method and/or approach to the implementation. It may also be the catalyst for one or many initiatives in order to implement the change.

A business case is used to:

- define the need,
- determine the desired outcomes,
- assess constraints, assumptions, and risks, and
- recommend a solution.

10.7.3 Elements

.1 Need Assessment

The need is the driver for the business case. It is the relevant business goal or objective that must be met. Objectives are linked to a strategy or the strategies of the enterprise. The need assessment identifies the problem or the potential opportunity. Throughout the development of the business case, different alternatives to solve the problem or take advantage of the opportunity will be assessed.

.2 Desired Outcomes

The desired outcomes describe the state which should result if the need is fulfilled. They should include measurable outcomes that can be utilized to determine the success of the business case or the solution. Desired outcomes

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should be revisited at defined milestones and at the completion of the initiative (or initiatives) to fulfill the business case. They should also be independent of the recommended solution. As solution options are assessed, their ability to achieve the desired outcomes will help determine the recommended solution.

.3 Assess Alternatives

The business case identifies and assesses various alternative solutions. Alternatives may include (but are not limited to) different technologies, processes, or business models. Alternatives may also include different ways of acquiring these and different timing options. They will be affected by constraints such as budget, timing, and regulatory. The 'do-nothing' alternative should be assessed and considered for the recommended solution.

Each alternative should be assessed in terms of:

- **Scope**: defines the alternative being proposed. Scope can be defined using organizational boundaries, system boundaries, business processes, product lines or geographic regions. Scope statements clearly define what will be included and what will be excluded. The scope of various alternatives may be similar or have overlap but may also differ based on the alternative.
- **Feasibility**: The organizational and technical feasibility should be assessed for each alternative. It includes organizational knowledge, skills, and capacity, as well as technical maturity and experience in the proposed technologies.
- **Assumptions, Risks, and Constraints**: Assumptions are agreed-to facts that may have influence on the initiative. Constraints are limitations that may restrict the possible alternatives. Risks are potential problems that may have a negative impact on the solution. Agreeing to and documenting these factors facilitates realistic expectations and a shared understanding amongst stakeholders.
- **Financial Analysis and Value Assessment**: The financial analysis and value assessment includes an estimate of the costs to implement and operate the alternative, as well as a quantified financial benefit from implementing the alternative. Benefits of a non-financial nature (such as improved staff morale, increased flexibility to respond to change, improved customer satisfaction, or reduced exposure to risk) are also important and add significant value to the organization. Value estimates are related back to strategic goals and objectives.

.4 Recommended Solution

The recommended solution describes the most desirable way to solve the problem or leverage the opportunity. The solution is described in sufficient detail for decision makers to understand the solution and determine if the recommendation will be implemented. The recommended solution may also include some estimates of cost and duration to implement the solution. Measurable benefits/outcomes will be identified to allow stakeholders to assess

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the performance and success of the solution after implementation and during operation.

10.7.4 Usage Considerations

.1 Strengths

- Provides an amalgamation of the complex facts, issues, and analysis required to make decisions regarding change.
- Provides a detailed financial analysis of cost and benefits.
- Provides guidance for ongoing decision making throughout the initiative.

.2 Limitations

- May be subject to the biases of authors.
- Frequently not updated once funding for the initiative is secured.
- Contains assumptions regarding costs and benefits that may prove invalid upon further investigation.

10.8 Business Model Canvas

10.8.1 Purpose

A business model canvas describes how an enterprise creates, delivers, and captures value for and from its customers.

10.8.2 Description

A business model canvas is comprised of nine building blocks that describe how an organization intends to deliver value:

- Key Partnerships,
- Key Activities,
- Key Resources,
- Value Proposition,
- Customer Relationships,
- Channels,
- Customer Segments,
- Cost Structure, and
- Revenue Streams.

These building blocks are arranged on a business canvas that shows the relationship between the organization's operations, finance, customers, and offerings. The business model canvas also serves as a blueprint for implementing a strategy.

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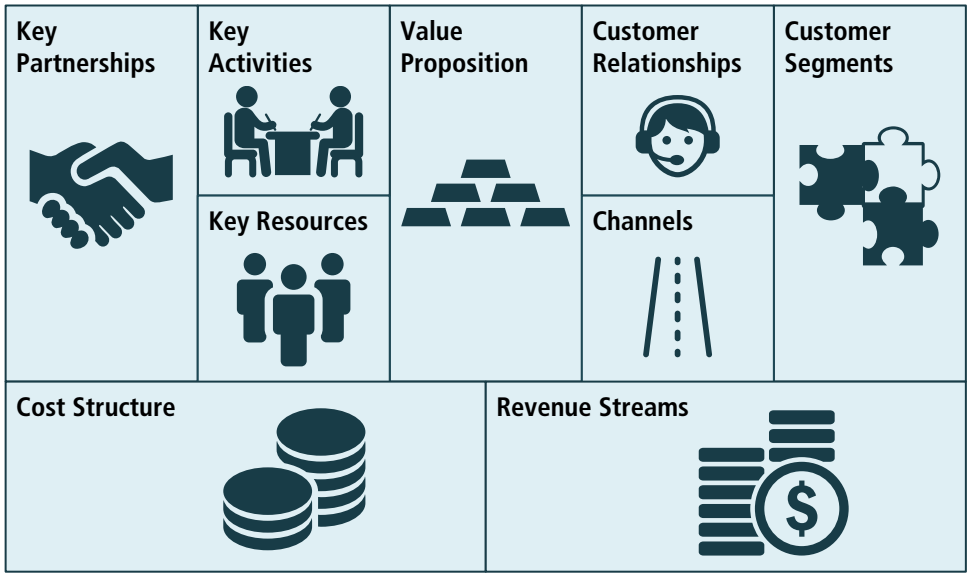
Figure 10.8.1: Business Model Canvas



A business model canvas can be used as a diagnostic and planning tool regarding strategy and initiatives. As a diagnostic tool, the various elements of the canvas are used as a lens into the current state of the business, especially with regards to the relative amounts of energy, time, and resources the organization is currently investing in various areas. As a planning and monitoring tool, the canvas can be used as a guideline and framework for understanding inter-dependencies and priorities among groups and initiatives.

A business model canvas allows for the mapping of programs, projects, and other initiatives (such as recruitment or talent retention) to the strategy of the enterprise. In this capacity, the canvas can be used to view where the enterprise is investing, where a particular initiative fits, and any related initiatives.

A business model canvas can also be used to demonstrate where the efforts of various departments and work groups fit and align to the overall strategy of the enterprise.

.1 Elements

Key Partnerships

Key partnerships frequently involve some degree of sharing of proprietary information, including technologies. An effective key partnership can, in some cases, lead to more formalized relationships such as mergers and acquisitions.

The benefits in engaging in key partnerships include:

- optimization and economy,
- reduction of risk and uncertainty,
- acquisition of particular resources and activities, and
- lack of internal capabilities.

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Key Activities

Key activities are those that are critical to the creation, delivery, and maintenance of value, as well as other activities that support the operation of the enterprise.

Key activities can be classified as:

- **Value-add**: characteristics, features, and business activities for which the customer is willing to pay.
- **Non-value-add**: aspects and activities for which the customer is not willing to pay.
- **Business non-value-add**: characteristics that must be included in the offering, activities performed to meet regulatory and other needs, or costs associated with doing business, for which the customer is not willing to pay.

Key Resources

Resources are the assets needed to execute a business model. Resources may be different based on the business model.

Resources can be classified as:

- **Physical**: applications, locations, and machines.
- **Financial**: what is needed to fund a business model, such as cash and lines of credit.
- **Intellectual**: any proprietary aspects that enable a business model to thrive, such as knowledge, patents and copyrights, customer databases, and branding.
- **Human**: the people needed to execute a particular business model.

Value Proposition

A value proposition represents what a customer is willing to exchange for having their needs met. The proposition may consist of a single product or service, or may be comprised of a set of goods and services that are bundled together to address the needs of a customer or customer segment to help them solve their problem.

Customer Relationships

In general, customer relationships are classified as customer acquisition and customer retention. The methods used in establishing and maintaining customer relationships vary depending on the level of interaction desired and the method of communication. For example, some relationships can be highly personalized, while others are automated and promote a self-serve approach. The relationships can also be formal or informal.

Organizations interact with their customers in different ways depending on the relationship they want to establish and maintain.

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Channels

Channels are the different ways an enterprise interacts with and delivers value to its customers. Some channels are very communication-oriented (for example, marketing channel), and some are delivery-oriented (for example, distribution channel). Other examples include sales channels and partnering channels.

Enterprises use channels to:

- raise awareness about their offerings,
- help customers evaluate the value proposition,
- allow customers to purchase a good or service,
- help the enterprise deliver on the value proposition, and
- provide support.

Understanding channels involves identifying the processes, procedures, technologies, inputs, and outputs (and their current impact), as well as understanding the relationship of the various channels to the strategies of the organization.

Customer Segments

Customer segments group customers with common needs and attributes so that the enterprise can more effectively and efficiently address the needs of each segment.

An organization within an enterprise may consider defining and targeting distinct customer segments based on:

- different needs for each segment,
- varying profitability between segments,
- different distribution channels, and
- formation and maintenance of customer relationships.

Cost Structure

Every entity, product, or activity within an enterprise has an associated cost. Enterprises seek to reduce, minimize, or eliminate costs wherever possible. Reducing costs may increase the profitability of an organization and allow those funds to be used in other ways to create value for the organization and for customers. Therefore, it is important to understand the type of business models, the differences in the types of costs and their impact, and where the enterprise is focusing its efforts to reduce costs.

Revenue Streams

A revenue stream is a way or method by which revenue comes into an enterprise from each customer segment in exchange for the realization of a value proposition. There are two basic ways revenue is generated for an enterprise:

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revenue resulting from a one-time purchase of a good or service and recurring revenue from periodic payments for a good, service, or ongoing support.

Some types of revenue streams include:

- **Licensing or Subscription fees**: the customer pays for the right to access a particular asset, either as a one-time fee or as a recurring cost.
- **Transaction or Usage fees**: the customer pays each time they use a good or service.
- **Sales**: the customer is granted ownership rights to a specific product.
- **Lending, Renting, or Leasing**: the customer has temporary rights to use an asset.

.2 Usage Considerations

Strengths

- It is a widely used and effective framework that can be used to understand and optimize business models.
- It is simple to use and easy to understand.

Limitations

- Does not account for alternative measures of value such as social and environmental impacts.
- The primary focus on value propositions does not provide a holistic insight for business strategy.
- Does not include the strategic purpose of the enterprise within the canvas.

10.9 Business Rules Analysis

10.9.1 Purpose

Business rules analysis is used to identify, express, validate, refine, and organize the rules that shape day-to-day business behaviour and guide operational business decision making.

10.9.2 Description

Business policies and rules guide the day-to-day operation of the business and its processes, and shape operational business decisions. A business policy is a directive concerned with broadly controlling, influencing, or regulating the actions of an enterprise and the people in it. A business rule is a specific, testable directive that serves as a criterion for guiding behaviour, shaping judgments, or making decisions. A business rule must be practicable (needing no further

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interpretation for use by people in the business) and is always under the control of the business.

Analysis of business rules involves capturing business rules from sources, expressing them clearly, validating them with stakeholders, refining them to best align with business goals, and organizing them so they can be effectively managed and reused. Sources of business rules may be explicit (for example, documented business policies, regulations, or contracts) or tacit (for example, undocumented stakeholder know-how, generally accepted business practices, or norms of the corporate culture). Business rules should be explicit, specific, clear, accessible, and single sourced. Basic principles for business rules include:

- basing them on standard business vocabulary to enable domain subject matter experts to validate them,
- expressing them separately from how they will be enforced,
- defining them at the atomic level and in declarative format,
- separating them from processes they support or constrain,
- mapping them to decisions the rule supports or constrains, and
- maintaining them in a manner such that they can be monitored and adapted as business circumstances evolve over time.

A set of rules for making an operational business decision may be expressed as a decision table or decision tree, as described in Decision Analysis (p. 261). The number of rules in such a set can be quite large, with a high level of complexity.

10.9.3 Elements

Business rules require consistent use of business terms, a glossary of definitions for the underlying business concepts, and an understanding of the structural connections among the concepts. Reuse of existing terminology from external industry associations or internal business glossaries is often advised. Sometimes definitions and structures from data dictionaries or data models can be helpful (see Data Dictionary (p. 247) and Data Modelling (p. 256)). Business rules should be expressed and managed independently of any implementation technology since they need to be available for reference by business people. In addition, they sometimes will be implemented in multiple platforms or software components. There are frequently exceptions to business rules; these should be treated simply as additional business rules. Existing business rules should be challenged to ensure they align with business goals and remain relevant, especially when new solutions emerge.

.1 Definitional Rules

Definitional rules shape concepts, or produce knowledge or information. They indicate something that is necessarily true (or untrue) about some concept, thereby supplementing its definition. In contrast to behavioural rules, which are about the behaviour of people, definitional rules represent operational

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knowledge of the organization. Definitional rules cannot be violated but they can be misapplied. An example of a definitional rule is:

> *A customer must be considered a Preferred Customer if they place more than 10 orders per month.*

Definitional rules often prescribe how information may be derived, inferred or calculated based on information available to the business. An inference or calculation may be the result of multiple rules, each building on something inferred or calculated by some other(s). Sets of definitional rules are often used to make operational business decisions during some process or upon some event. An example of a calculation rule is:

> *An order's local jurisdiction tax amount must be calculated as (sum of the prices of all the order's taxable ordered items) × local jurisdiction tax rate amount.*

.2 Behavioural Rules

Behavioural rules are people rules–even if the behaviour is automated. Behavioural rules serve to shape (govern) day-to-day business activity. They do so by placing some obligation or prohibition on conduct, action, practice, or procedure.

Behavioural rules are rules the organization chooses to enforce as a matter of policy, often to reduce risk or enhance productivity. They frequently make use of the information or knowledge produced by definitional rules (which are about shaping knowledge or information). Behavioural rules are intended to guide the actions of people working within the organization, or people who interact with it. They may oblige individuals to perform actions in a certain way, prevent them from carrying out actions, or prescribe the conditions under which something can be correctly done. An example of a behavioural rule is:

> *An order must not be placed when the billing address provided by the customer does not match the address on file with the credit card provider.*

In contrast to definitional rules, behavioural rules are rules that can be violated directly. By definition, it is always possible to violate a behavioural rule—even if there are no circumstances under which the organization would approve that, and despite the fact that the organization takes extraordinary precautions in its solution to prevent it. Because of this, further analysis should be conducted to determine how strictly the rule needs to be enforced, what kinds of sanctions should be imposed when it is violated, and what additional responses to a violation might be appropriate. Such analysis often leads to specification of additional rules.

Various levels of enforcement may be specified for a behavioural rule. For example:

- Allow no violations (strictly enforced).
- Override by authorized actor.

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- Override with explanation.
- No active enforcement.

A behavioural rule for which there is no active enforcement is simply a guideline that suggests preferred or optimal business behaviour.

10.9.4 Usage Considerations

.1 Strengths

- When enforced and managed by a single enterprise-wide engine, changes to business rules can be implemented quickly.
- A centralized repository creates the ability to reuse business rules across an organization.
- Business rules provide structure to govern business behaviours.
- Clearly defining and managing business rules allows organizations to make changes to policy without altering processes or systems.

.2 Limitations

- Organizations may produce lengthy lists of ambiguous business rules.
- Business rules can contradict one another or produce unanticipated results when combined unless validated against one another.
- If available vocabulary is insufficiently rich, not business-friendly, or poorly defined and organized, resulting business rules will be inaccurate or contradictory.

10.10 Collaborative Games

10.10.1 Purpose

Collaborative games encourage participants in an elicitation activity to collaborate in building a joint understanding of a problem or a solution.

10.10.2 Description

Collaborative games refer to several structured techniques inspired by game play and are designed to facilitate collaboration. Each game includes rules to keep participants focused on a specific objective. The games are used to help the participants share their knowledge and experience on a given topic, identify hidden assumptions, and explore that knowledge in ways that may not occur during the course of normal interactions. The shared experience of the collaborative game encourages people with different perspectives on a topic to work together in order to better understand an issue and develop a shared model

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of the problem or of potential solutions. Many collaborative games can be used to understand the perspectives of various stakeholder groups.

Collaborative games often benefit from the involvement of a neutral facilitator who helps the participants understand the rules of the game and enforces those rules. The facilitator's job is to keep the game moving forward and to help ensure that all participants play a role. Collaborative games usually involve a strong visual or tactile element. Activities such as moving sticky notes, scribbling on whiteboards, or drawing pictures help people to overcome inhibitions, foster creative thinking, and think laterally.

10.10.3 Elements

.1 Game Purpose

Each different collaborative game has a defined purpose—usually to develop a better understanding of a problem or to stimulate creative solutions—that is specific to that type of game. The facilitator helps the participants in the game understand the purpose and work toward the successful realization of that purpose.

.2 Process

Each type of collaborative game has a process or set of rules that, when followed, keeps the game moving toward its goal. Each step in the game is often limited by time.

Games typically have at least three steps:

Step 1. an opening step, in which the participants get involved, learn the rules of the game, and start generating ideas,

Step 2. the exploration step, in which participants engage with one another and look for connections between their ideas, test those ideas, and experiment with new ideas, and

Step 3. a closing step, in which the ideas are assessed and participants work out which ideas are likely to be the most useful and productive.

.3 Outcome

At the end of a collaborative game, the facilitator and participants work through the results and determine any decisions or actions that need to be taken as a result of what the participants have learned.

.4 Examples of Collaborative Games

There are many types of collaborative games available, including (but not limited to) the following:

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Table 10.10.1: Examples of Collaborative Games

Game	Description	Objective
Product Box	Participants construct a box for the product as if it was being sold in a retail store.	Used to help identify features of a product that help drive interest in the marketplace.
Affinity Map	Participants write down features on sticky notes, put them on a wall, and then move them closer to other features that appear similar in some way.	Used to help identify related or similar features or themes.
Fishbowl	Participants are divided into two groups. One group of participants speaks about a topic, while the other group listens intently and documents their observations.	Used to identify hidden assumptions or perspectives.

10.10.4 Usage Considerations

.1 Strengths

- May reveal hidden assumptions or differences of opinion.
- Encourages creative thinking by stimulating alternative mental processes.
- Challenges participants who are normally quiet or reserved to take a more active role in team activities.
- Some collaborative games can be useful in exposing business needs that aren't being met.

.2 Limitations

- The playful nature of the games may be perceived as silly and make participants with reserved personalities or cultural norms uncomfortable.
- Games can be time-consuming and may be perceived as unproductive, especially if the objectives or outcomes are unclear.
- Group participation can lead to a false sense of confidence in the conclusions reached.

10.11 Concept Modelling

10.11.1 Purpose

A concept model is used to organize the business vocabulary needed to consistently and thoroughly communicate the knowledge of a domain.

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10.11.2 Description

A concept model starts with a glossary, which typically focuses on the core noun concepts of a domain. Concept models put a premium on high-quality, design-independent definitions that are free of data or implementation biases. Concept models also emphasize rich vocabulary.

A concept model identifies the correct choice of terms to use in communications, including all business analysis information. It is especially important where high precision and subtle distinctions need to be made.

Concept models can be effective where:

- the enterprise seeks to organize, retain, build-on, manage, and communicate core knowledge,
- the initiative needs to capture large numbers of business rules,
- there is resistance from stakeholders about the perceived technical nature of data models, class diagrams, or data element nomenclature and definition,
- innovative solutions are sought when re-engineering business processes or other aspects of business capability, and
- the enterprise faces regulatory or compliance challenges.

A concept model differs from a data model. The goal of a concept model is to support the expression of natural language statements, and supply their semantics. Concept models are not intended to unify, codify, and simplify data. Therefore the vocabulary included in a concept model is far richer, as suits knowledge-intensive domains. Concept models are often rendered graphically.

10.11.3 Elements

.1 Noun Concepts

The most basic concepts in a concept model are the noun concepts of the domain, which are simply 'givens' for the space.

.2 Verb Concepts

Verb concepts provide basic structural connections between noun concepts. These verb concepts are given standard wordings, so they can be referenced unambiguously. These wordings by themselves are not necessarily sentences; rather, they are the building blocks of sentences (such as business rule statements). Sometimes verb concepts are derived, inferred, or computed by definitional rules. This is how new knowledge or information is built up from more basic facts.

.3 Other Connections

Since concept models must support rich meaning (semantics), other types of standard connections are used besides verb concepts.

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These include but are not limited to:

- categorizations,
- classifications,
- partitive (whole-part) connections, and
- roles.

10.11.4 Usage Considerations

.1 Strengths

- Provide a business-friendly way to communicate with stakeholders about precise meanings and subtle distinctions.
- Is independent of data design biases and the often limited business vocabulary coverage of data models.
- Proves highly useful for white-collar, knowledge-rich, decision-laden business processes.
- Helps ensure that large numbers of business rules and complex decision tables are free of ambiguity and fit together cohesively.

.2 Limitations

- May set expectations too high about how much integration based on business semantics can be achieved on relatively short notice.
- Requires a specialized skill set based on the ability to think abstractly and non-procedurally about know-how and knowledge.
- The knowledge-and-rule focus may be foreign to stakeholders.
- Requires tooling to actively support real-time use of standard business terminology in writing business rules, requirements, and other forms of business communication.

10.12 Data Dictionary

10.12.1 Purpose

A data dictionary is used to standardize a definition of a data element and enable a common interpretation of data elements.

10.12.2 Description

A data dictionary is used to document standard definitions of data elements, their meanings, and allowable values. A data dictionary contains definitions of each data element and indicates how those elements combine into composite data elements. Data dictionaries are used to standardize usage and meanings of data elements between solutions and between stakeholders.

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Data dictionaries are sometimes referred to as metadata repositories and are used to manage the data within the context of a solution. As organizations adopt data mining and more advanced analytics, a data dictionary may provide the metadata required by these more complex scenarios. A data dictionary is often used in conjunction with an entity relationship diagram (see Data Modelling (p. 256)) and may be extracted from a data model.

Data dictionaries can be maintained manually (as a spreadsheet) or via automated tools.

Figure 10.12.1: Example of a Data Dictionary

Primitive Data Elements	Data Element 1	Data Element 2	Data Element 3
Name Name referenced by data elements	First Name	Middle Name	Last Name
Alias Alternate name referenced by stakeholders	Given Name	Middle Name	Surname
Values/Meanings Enumerated list or description of data element	Minimum 2 characters	Can be omitted	Minimum 2 characters
Description Definition	First Name	Middle Name	Family Name
Composite	**Customer Name =** First Name + Middle Name + Family Name		

10.12.3 Elements

.1 Data Elements

Data dictionaries describe data element characteristics including the description of the data element in the form of a definition that will be used by stakeholders. Data dictionaries include standard definitions of data elements, their meanings, and allowable values. A data dictionary contains definitions of each primitive data element and indicates how those elements combine into composite data elements.

.2 Primitive Data Elements

The following information must be recorded about each data element in the data

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dictionary:

- **Name**: a unique name for the data element, which will be referenced by the composite data elements.
- **Aliases**: alternate names for the data element used by various stakeholders.
- **Values/Meanings**: a list of acceptable values for the data element. This may be expressed as an enumerated list or as a description of allowed formats for the data (including information such as the number of characters). If the values are abbreviated this will include an explanation of the meaning.
- **Description**: the definition of the data element in the context of the solution.

.3 Composite Elements

Composite data elements are built using data elements to build composite structures, which may include:

- **Sequences**: required ordering of primitive data elements within the composite structure. For example, a plus sign indicates that one element is followed by or concatenated with another element: Customer Name = First Name+Middle Name+Family Name.
- **Repetitions**: whether one or more data elements may be repeated multiple times.
- **Optional Elements**: may or may not occur in a particular instance of the composite element.

10.12.4 Usage Considerations

.1 Strengths

- Provides all stakeholders with a shared understanding of the format and content of relevant information.
- A single repository of corporate metadata promotes the use of data throughout the organization in a consistent manner.

.2 Limitations

- Requires regular maintenance, otherwise the metadata could become obsolete or incorrect.
- All maintenance is required to be completed in a consistent manner in order to ensure that stakeholders can quickly and easily retrieve the information they need. This requires time and effort on the part of the stewards responsible for the accuracy and completeness of the data dictionary.
- Unless care is taken to consider the metadata required by multiple scenarios, it may have limited value across the enterprise.

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10.13 Data Flow Diagrams

10.13.1 Purpose

Data flow diagrams show where data comes from, which activities process the data, and if the output results are stored or utilized by another activity or external entity.

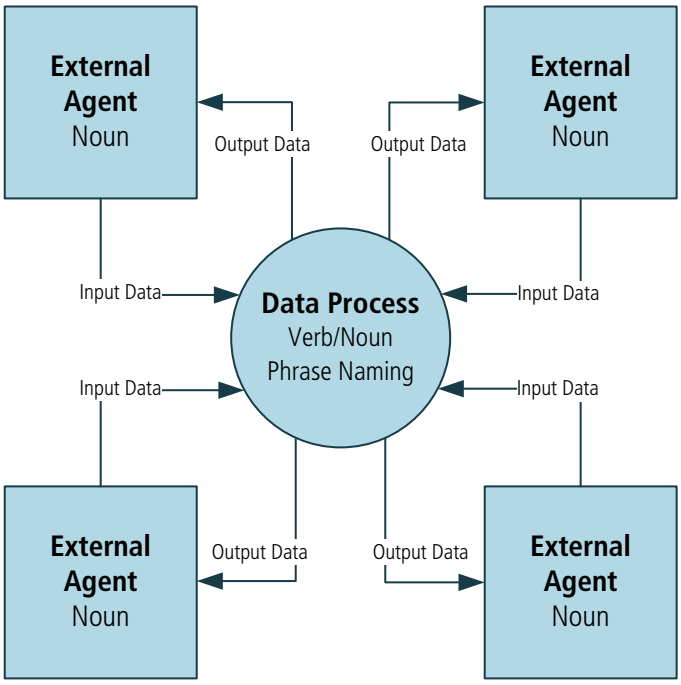
10.13.2 Description

Data flow diagrams portray the transformation of data. They are useful for depicting a transaction-based system and illustrating the boundaries of a physical, logical, or manual system.

A data flow diagram illustrates the movement and transformation of data between externals (entities) and processes. The output from one external or process is the input to another. The data flow diagram also illustrates the temporary or permanent repositories (referred to as data stores or terminators) where data is stored within a system or an organization. The data defined should be described in a data dictionary (see Data Dictionary (p. 247)).

Data flow diagrams can consist of multiple layers of abstraction. The highest level diagram is a context diagram which represents the entire system. Context diagrams show the system in its entirety, as a transformation engine with externals as the source or consumer of data.

Figure 10.13.1: Context Diagram Gane-Sarson Notation



The next level of data flow diagrams is the level 1 diagram. Level 1 diagrams illustrate the processes related to the system with the respective input data, output transformed data, and data stores.

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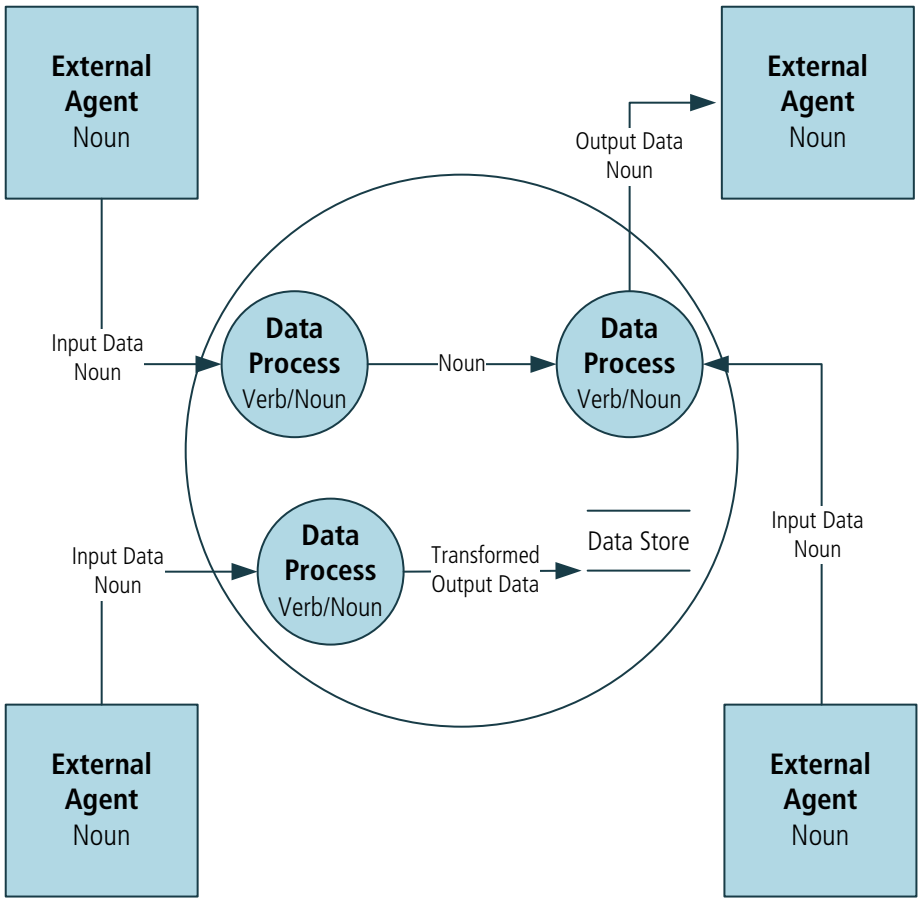
Figure 10.13.2: Level 1 Diagram Yourdon Notation



Further levels of the data flow diagram (level 2, level 3 and so forth) break down the major processes from the level 1 diagram. Level 1 diagrams are useful to show the internal partitioning of the work and the data that flows between the partitions, as well as the stored data used by each of the partitions. Each of the partitions can be further decomposed if needed. The externals remain the same and additional flows and stores are defined.

Logical data flow diagrams represent the future or essential state—that is, what transformations need to occur regardless of the current physical limitations. Physical data flow diagrams model all of the data stores, printers, forms, devices, and other manifestations of data. The physical diagram can show either the current state or how it will be implemented.

10.13.3 Elements

.1 Externals (Entity, Source, Sink)

An external (entity, source, sink) is a person, organization, automated system, or any device capable of producing data or receiving data. An external is an object which is outside of the system under analysis. Externals are the sources and/or destinations (sinks) of the data. Each external must have at least one data flow going to or coming from it. Externals are represented by using a noun inside a rectangle and are found within context-level diagrams as well as lower levels of abstraction.

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.2 Data Store

A data store is a collection of data where data may be read repeatedly and where it can be stored for future use. In essence, it is data at rest. Each data store must have at least one data flow going to or coming from it. A data store is represented as either two parallel lines or as an open-ended rectangle with a label.

.3 Process

A process can be a manual or automated activity performed for a business reason. A process transforms the data into an output. Naming standards for a process should contain a verb and a noun. Each process must have at least one data flow going to it and one data flow coming from it. A data process is represented as a circle or rectangle with rounded corners.

.4 Data Flow

The movement of data between an external, a process, and a data store is represented by data flows. The data flows hold processes together. Every data flow will connect to or from a process (transformation of the data). Data flows show the inputs and outputs of each process. Every process transforms an input into an output. Data flows are represented as a line with an arrow displayed between processes. The data flow is named using a noun.

Figure 10.13.3: Data Flow Diagram Gane-Sarson Notation

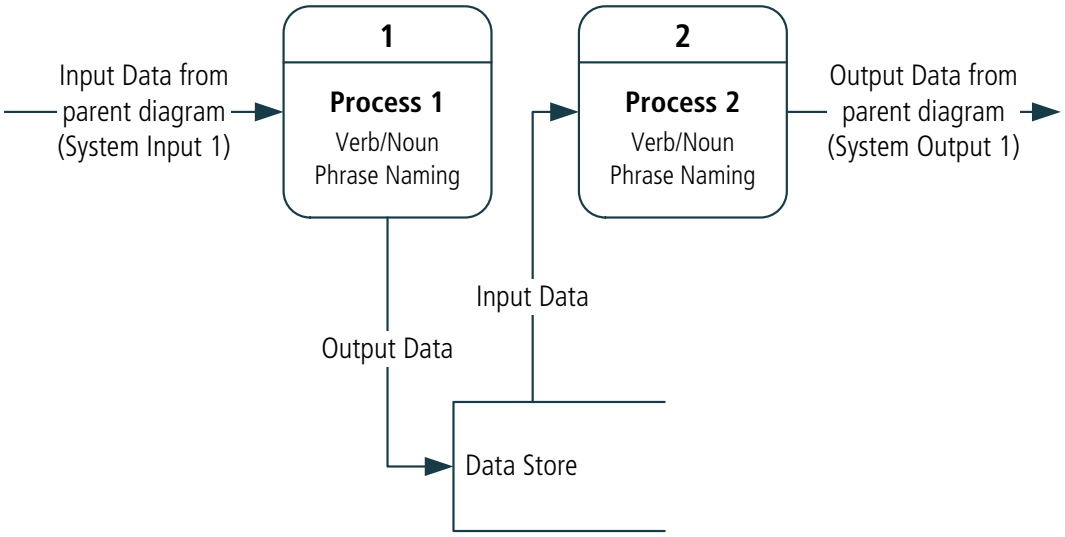
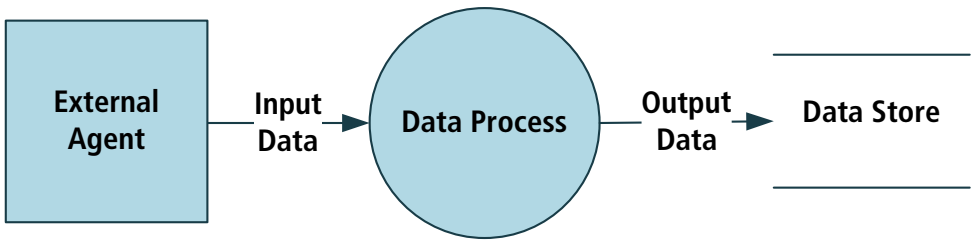


Figure 10.13.4: Data Flow Diagram Yourdon Notation



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10.13.4 Usage Considerations

.1 Strengths

- May be used as a discovery technique for processes and data or as a Technique for the verification of functional decompositions or data models.
- Are excellent ways to define the scope of a system and all of the systems, interfaces, and user interfaces that attach to it. Allows for estimation of the effort needed to study the work.
- Most users find these data flow diagrams relatively easy to understand.
- Helps to identify duplicated data elements or misapplied data elements.
- Illustrates connections to other systems.
- Helps define the boundaries of a system.
- Can be used as part of system documentation.
- Helps to explain the logic behind the data flow within a system.

.2 Limitations

- Using data flow diagrams for large-scale systems can become complex and difficult for stakeholders to understand.
- Different methods of notation with different symbols could create challenges pertaining to documentation.
- Does not illustrate a sequence of activities.
- Data transformations (processes) say little about the process or stakeholder.

10.14 Data Mining

10.14.1 Purpose

Data mining is used to improve decision making by finding useful patterns and insights from data.

10.14.2 Description

Data mining is an analytic process that examines large amounts of data from different perspectives and summarizes the data in such a way that useful patterns and relationships are discovered.

The results of data mining techniques are generally mathematical models or equations that describe underlying patterns and relationships. These models can be deployed for human decision making through visual dashboards and reports, or for automated decision-making systems through business rule management systems or in-database deployments.

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Data mining can be utilized in either supervised or unsupervised investigations. In a supervised investigation, users can pose a question and expect an answer that can drive their decision making. An unsupervised investigation is a pure pattern discovery exercise where patterns are allowed to emerge, and then considered for applicability to business decisions.

Data mining is a general term that covers descriptive, diagnostic, and predictive techniques:

- **Descriptive**: such as clustering make it easier to see the patterns in a set of data, such as similarities between customers.
- **Diagnostic**: such as decision trees or segmentation can show why a pattern exists, such as the characteristics of an organization's most profitable customers.
- **Predictive**: such as regression or neural networks can show how likely something is to be true in the future, such as predicting the probability that a particular claim is fraudulent.

In all cases it is important to consider the goal of the data mining exercise and to be prepared for considerable effort in securing the right type, volume, and quality of data with which to work.

10.14.3 Elements

.1 Requirements Elicitation

The goal and scope of data mining is established either in terms of decision requirements for an important identified business decision, or in terms of a functional area where relevant data will be mined for domain-specific pattern discovery. This top-down versus a bottom-up mining strategy allows analysts to pick the correct set of data mining techniques.

Formal decision modelling techniques (see Decision Modelling (p. 265)) are used to define requirements for top-down data mining exercises. For bottom-up pattern discovery exercises it is useful if the discovered insight can be placed on existing decision models, allowing rapid use and deployment of the insight.

Data mining exercises are productive when managed as an agile environment. They assist rapid iteration, confirmation, and deployment while providing project controls.

.2 Data Preparation: Analytical Dataset

Data mining tools work on an analytical dataset. This is generally formed by merging records from multiple tables or sources into a single, wide dataset. Repeating groups are typically collapsed into multiple sets of fields. The data may be physically extracted into an actual file or it may be a virtual file that is left in the database or data warehouse so it can be analyzed. Analytical datasets are split into a set to be used for analysis, a completely independent set for confirming that the model developed works on data not used to develop it, and a validation set for final confirmation. Data volumes can be very large, sometimes resulting in

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the need to work with samples or to work in-datastore so that the data does not have to be moved around.

.3 Data Analysis

Once the data is available, it is analyzed. A wide variety of statistical measures are typically applied and visualization tools used to see how data values are distributed, what data is missing, and how various calculated characteristics behave. This step is often the longest and most complex in a data mining effort and is increasingly the focus of automation. Much of the power of a data mining effort typically comes from identifying useful characteristics in the data. For instance, a characteristic might be the number of times a customer has visited a store in the last 80 days. Determining that the count over the last 80 days is more useful than the count over the last 70 or 90 is key.

.4 Modelling Techniques

There are a wide variety of data mining techniques.

Some examples of data mining techniques are:

- classification and regression trees (CART), C5 and other decision tree analysis techniques,
- linear and logistic regression,
- neural networks,
- support sector machines, and
- predictive (additive) scorecards.

The analytical dataset and the calculated characteristics are fed into these algorithms which are either unsupervised (the user does not know what they are looking for) or supervised (the user is trying to find or predict something specific). Multiple techniques are often used to see which is most effective. Some data is held out from the modelling and used to confirm that the result can be replicated with data that was not used in the initial creation.

.5 Deployment

Once a model has been built, it must be deployed to be useful. Data mining models can be deployed in a variety of ways, either to support a human decision maker or to support automated decision-making systems. For human users, data mining results may be presented using visual metaphors or as simple data fields. Many data mining techniques identify potential business rules that can be deployed using a business rules management system. Such executable business rules can be fitted into a decision model along with expert rules as necessary. Some data mining techniques—especially those described as predictive analytic techniques—result in mathematical formulas. These can also be deployed as executable business rules but can also be used to generate SQL or code for deployment. An increasingly wide range of in-database deployment options allow such models to be integrated into an organization's data infrastructure.

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10.14.4 Usage Considerations

.1 Strengths

- Reveal hidden patterns and create useful insight during analysis—helping determine what data might be useful to capture or how many people might be impacted by specific suggestions.
- Can be integrated into a system design to increase the accuracy of the data.
- Can be used to eliminate or reduce human bias by using the data to determine the facts.

.2 Limitations

- Applying some techniques without an understanding of how they work can result in erroneous correlations and misapplied insight.
- Access to big data and to sophisticated data mining tool sets and software may lead to accidental misuse.
- Many techniques and tools require specialist knowledge to work with.
- Some techniques use advanced math in the background and some stakeholders may not have direct insights into the results. A perceived lack of transparency can cause resistance from some stakeholders.
- Data mining results may be hard to deploy if the decision making they are intended to influence is poorly understood.

10.15 Data Modelling

10.15.1 Purpose

A data model describes the entities, classes or data objects relevant to a domain, the attributes that are used to describe them, and the relationships among them to provide a common set of semantics for analysis and implementation.

10.15.2 Description

A data model usually takes the form of a diagram that is supported by textual descriptions. It visually represents the elements that are important to the business (for example, people, places, things, and business transactions), the attributes associated with those elements, and the significant relationships among them. Data models are frequently used in elicitation and requirements analysis and design, as well as to support implementation and continuous improvement.

There are several variations of data models:

- **Conceptual data model**: is independent of any solution or technology and can be used to represent how the business perceives its information. It can be used to help establish a consistent vocabulary describing business

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information and the relationships within that information.

- **Logical data model**: is an abstraction of the conceptual data model that incorporates rules of normalization to formally manage the integrity of the data and relationships. It is associated with the design of a solution.
- **Physical data model**: is used by implementation subject matter experts to describe how a database is physically organized. It addresses concerns like performance, concurrency, and security.

The conceptual, logical, and physical data models are developed for different purposes and may be significantly different even when depicting the same domain.

At the conceptual level, different data modelling notations are likely to produce broadly similar results and can be thought of as a single technique (as presented here). Logical and physical data models include elements specific to the solutions they support, and are generally developed by stakeholders with expertise in implementing particular technical solutions. For instance, logical and physical entity-relationship diagrams (ERDs) would be used to implement a relational database, whereas a logical or physical class diagram would be used to support object-oriented software development.

Object diagrams can be used to illustrate particular instances of entities from a data model. They can include actual sample values for the attributes, making object diagrams more concrete and more easily understood.

10.15.3 Elements

.1 Entity or Class

In a data model, the organization keeps data on entities (or classes or data objects). An entity may represent something physical (such as a Warehouse), something organizational (such as a Sales Area), something abstract (such as a Product Line), or an event (such as an Appointment). An entity contains attributes and has relationships to other entities in the model.

In a class diagram, entities are referred to as classes. Like an entity in a data model, a class contains attributes and has relationships with other classes. A class also contains operations or functions that describe what can be done with the class, such as generating an invoice or opening a bank account.

Each instance of an entity or class will have a unique identifier that sets it apart from other instances.

.2 Attribute

An attribute defines a particular piece of information associated with an entity, including how much information can be captured in it, its allowable values, and the type of information it represents. Attributes can be described in a data dictionary (see Data Dictionary (p. 247)). Allowable values may be specified through business rules (see Business Rules Analysis (p. 240)).

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Attributes can include such values as:

- **Name**: a unique name for the attribute. Other names used by stakeholders may be captured as aliases.
- **Values/Meanings**: a list of acceptable values for the attribute. This may be expressed as an enumerated list or as a description of allowed formats for the data (including information such as the number of characters). If the values are abbreviated this will include an explanation of the meaning.
- **Description**: the definition of the attribute in the context of the solution.

.3 Relationship or Association

The relationships between entities provide structure for the data model, specifically indicating which entities relate to which others and how. Specifications for a relationship typically indicate the number of minimum and maximum occurrences allowed on each side of that relationship (for example, every customer is related to exactly one sales area, while a sales area may be related to zero, one, or many customers). The term cardinality is used to refer to the minimum and maximum number of occurrences to which an entity may be related. Typical cardinality values are zero, one, and many.

The relationship between two entities may be read in either direction, using this format:

> *Each occurrence (of this entity) is related to (minimum, maximum) (of this other entity).*

In a class model, the term association is used instead of relationship and multiplicity is used instead of cardinality.

.4 Diagrams

Both data models and class models may have one or more diagrams that show entities, attributes, and relationships.

The diagram in a data model is called an entity-relationship diagram (ERD). In a class model, the diagram is called a class diagram.

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Figure 10.15.1: Entity-Relationship Diagram (Crow's Foot Notation)

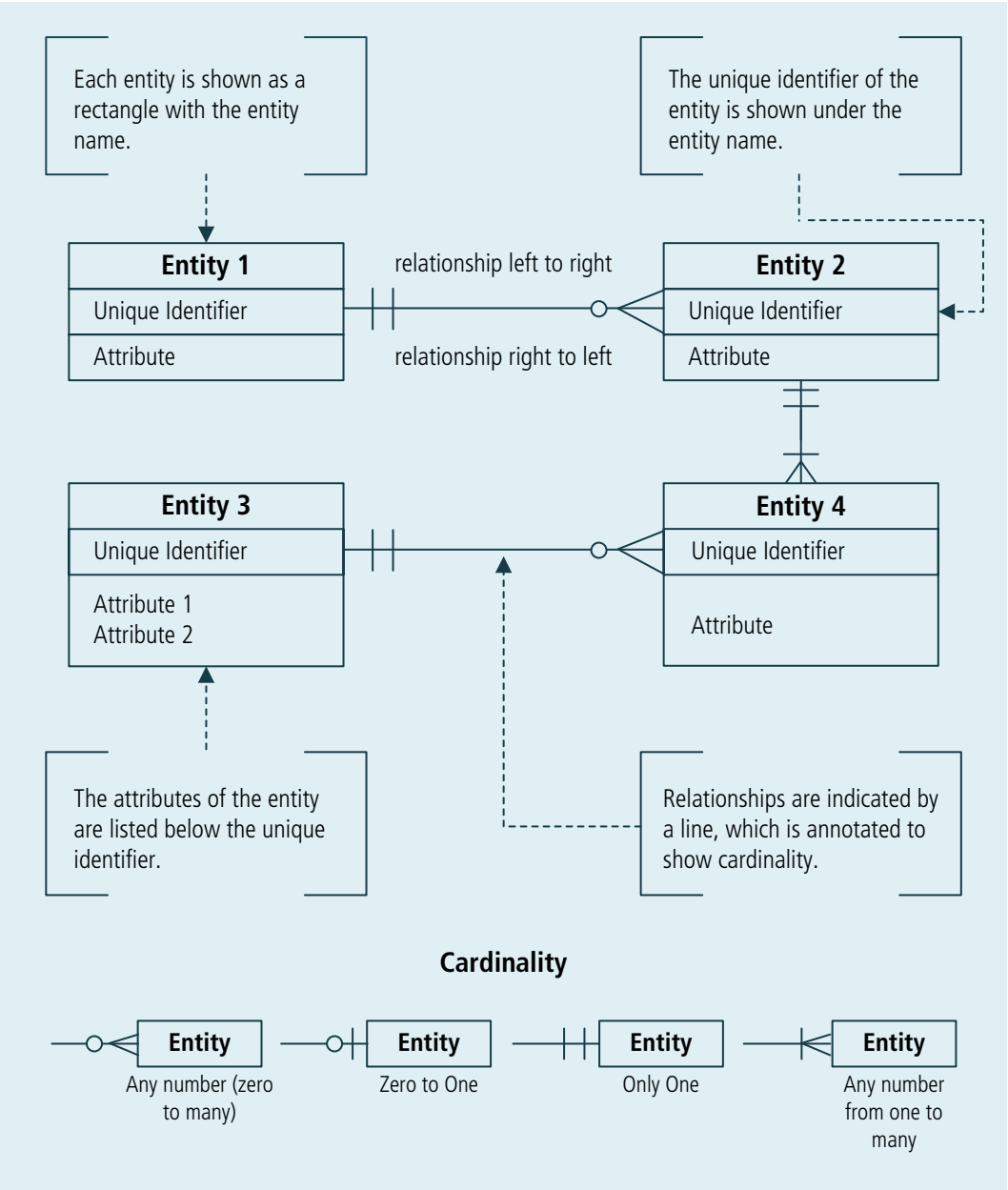

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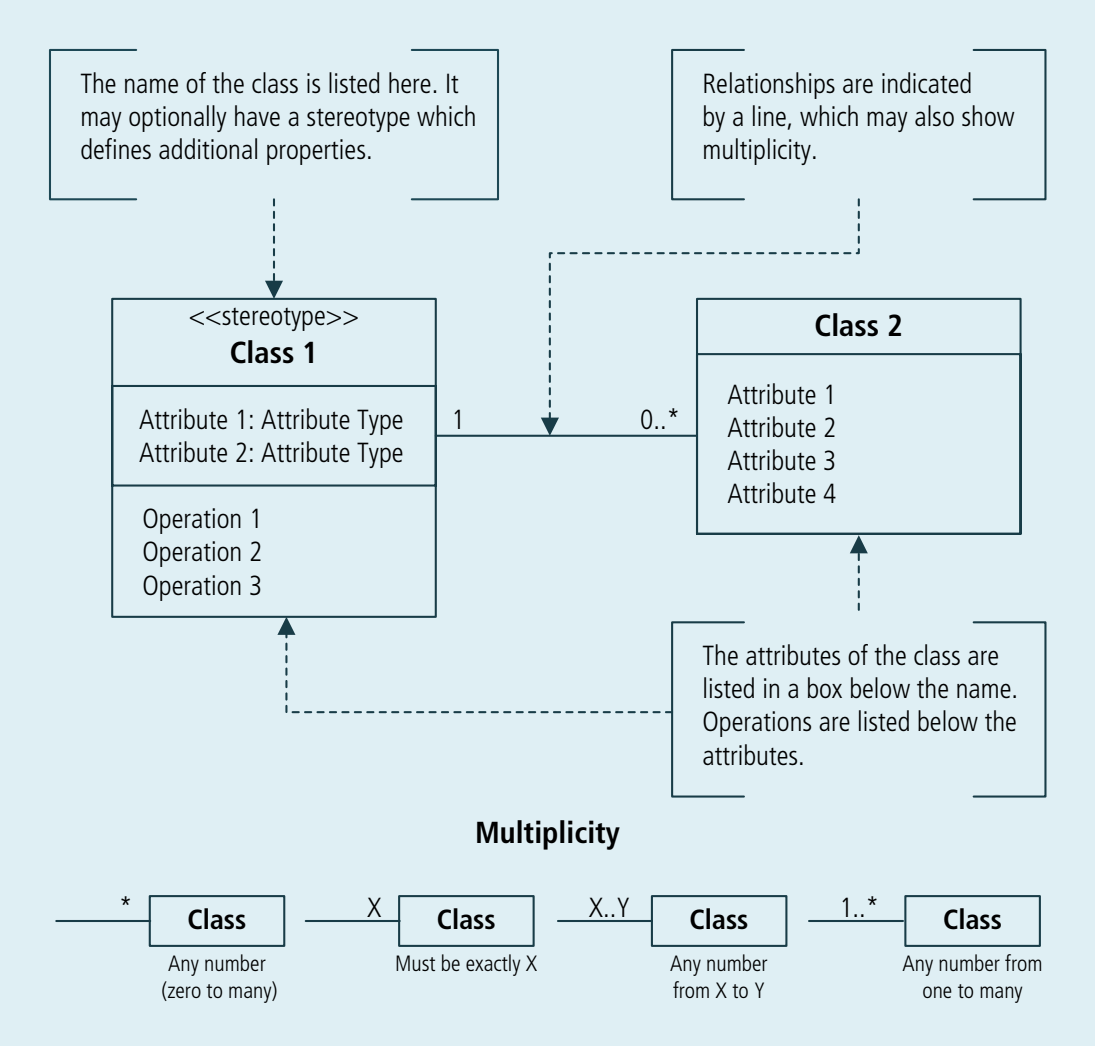
Figure 10.15.2: Class Diagram (UML®)



.5 Metadata

A data model optionally contains metadata describing what the entities represent, when and why they were created or changed, how they should be used, how often they are used, when, and by whom. There could be restrictions on their creation or use, as well as security, privacy, and audit constraints on specific entities or whole groups of entities.

10.15.4 Usage Considerations

.1 Strengths

- Can be used to define and communicate a consistent vocabulary used by domain subject matter experts and implementation subject matter experts.
- Review of a logical data model helps to ensure that the logical design of persistent data correctly represents the business need.
- Provides a consistent approach to analyzing and documenting data and its relationships.

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- Offers the flexibility of different levels of detail, which provides just enough information for the respective audience.
- Formal modelling of the information held by the business may expose new requirements as inconsistencies are identified.

.2 Limitations

- Following data modelling standards too rigorously may lead to models that are unfamiliar to people without a background in IT.
- May extend across multiple functional areas of the organization, and so beyond the business knowledge base of individual stakeholders.

10.16 Decision Analysis

10.16.1 Purpose

Decision analysis formally assesses a problem and possible decisions in order to determine the value of alternate outcomes under conditions of uncertainty.

10.16.2 Description

Decision analysis examines and models the possible consequences of different decisions about a given problem. A decision is the act of choosing a single course of action from several uncertain outcomes with different values. The outcome value may take different forms depending on the domain, but commonly include financial value, scoring, or a relative ranking dependent on the approach and evaluation criteria used by the business analyst.

Decisions are often difficult to assess when:

- the problem is poorly defined,
- the action leading to a desired outcome is not fully understood,
- the external factors affecting a decision are not fully understood, or
- the value of different outcomes is not understood or agreed upon by the various stakeholders and does not allow for direct comparison.

Decision analysis helps business analysts evaluate different outcome values under conditions of uncertainty or in highly complex situations. A variety of decision analysis approaches are available. The appropriate approach depends on the level of uncertainty, risk, quality of information, and available evaluation criteria. Effective decision analysis requires an understanding of:

- the values, goals, and objectives that are relevant to the decision problem,
- the nature of the decision that must be made,
- the areas of uncertainty that affect the decision, and
- the consequences of each potential decision.

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Decision analysis approaches use the following activities:

1. **Define Problem Statement**: clearly describe the decision problem to be addressed.
2. **Define Alternatives**: identify possible propositions or courses of action.
3. **Evaluate Alternatives**: determine a logical approach to analyze the alternatives. An agreement of evaluation criteria can also be determined at the beginning of this activity.
4. **Choose Alternative to Implement**: the stakeholders responsible for making the decision choose which alternative will be implemented based on the decision analysis results.
5. **Implement Choice**: implement the chosen alternative.

There are a number of decision analysis tools available to assist the business analyst and decision makers in making objective decisions. Some of the tools and techniques are best for deciding between two alternatives, while others handle multiple alternatives.

Some general decision analysis tools and techniques include:

- pro versus con considerations,
- force field analysis,
- decision tables,
- decision trees,
- comparison analysis,
- analytical hierarchy process (AHP),
- totally-partially-not (TPN),
- multi-criteria decision analysis (MCDA), and
- computer-based simulations and algorithms.

10.16.3 Elements

.1 Components of Decision Analysis

General components of decision analysis include:

- **Decision to be Made or Problem Statement**: a description of what the decision question or problem is about.
- **Decision Maker**: person or people responsible for making the final decision.
- **Alternative**: a possible proposition or course of action.
- **Decision Criteria**: evaluation criteria used to evaluate the alternatives.

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.2 Decision Matrices

The tables below provide examples of a a simple decision matrix and a weighted decision matrix.

A simple decision matrix checks whether or not each alternate meets each criterion being evaluated, and then totals the number of criteria matched for each alternate. In this example, Alternate 1 would likely be selected because it matches the most criteria.

Table 10.16.1: Simple Decision Matrix

	Alternate 1	Alternate 2	Alternate 3
Criterion 1	Meets criterion	n/a	n/a
Criterion 2	Meets criterion	Meets criterion	Meets criterion
Criterion 3	n/a	Meets criterion	Meets criterion
Criterion 4	Meets criterion	n/a	n/a
Score	3	2	2

A weighted decision matrix assesses options in which each criterion is weighted based on importance. The higher the weighting, the more important the criterion. In this example, the criteria are weighted on a scale of 1-5, where 5 indicates the most important. The alternates are ranked per criterion on a scale of 1-5, where 5 indicates the best match. In this example, Alternate 3 would likely be selected due to its high weighted score.

Table 10.16.2: Weighted Decision Matrix

	Criterion Weighting	Alternate 1	Alt 1 Value	Alternate 2	Alt 2 Value	Alternate 3	Alt 3 Value
Criterion 1	1	Rank = 1*3	3	Rank = 1*5	5	Rank = 1*2	2
Criterion 2	1	Rank = 1*5	5	Rank = 1*4	4	Rank = 1*3	8
Criterion 3	3	Rank = 3*5	15	Rank = 3*1	3	Rank = 3*5	15
Criterion 4	5	Rank = 5*1	5	Rank = 5*5	25	Rank = 5*3	15
Weighted Score			28		37		40

.3 Decision Trees

A decision tree is a method of assessing the preferred outcome where multiple sources of uncertainty may exist. A decision tree allows for assessment of responses to uncertainty to be factored across multiple strategies.

Decision trees include:

- **Decision Nodes**: that include different strategies.
- **Chance Nodes**: that define uncertain outcomes.
- **Terminator or End Nodes**: that identify a final outcome of the tree.

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.4 Trade-offs

Trade-offs become relevant whenever a decision problem involves multiple, possibly conflicting, objectives. Because more than one objective is relevant, it is not sufficient to simply find the maximum value for one variable (such as the financial benefit for the organization). When making trade-offs, effective methods include:

- **Elimination of dominated alternatives**: a dominated alternative is any option that is clearly inferior to some other option. If an option is equal to or worse than some other option when rated against the objectives, the other option can be said to dominate it. In some cases, an option may also be dominated if it only offers very small advantages but has significant disadvantages.
- **Ranking objectives on a similar scale**: one method of converting rankings to a similar scale is proportional scoring. Using this method, the best outcome is assigned a rating of 100, the worst a rating of 0, and all other outcomes are given a rating based on where they fall between those two scores. If the outcomes are then assigned weights based on their relative importance, a score can be assigned to each outcome and the best alternative assigned using a decision tree.

10.16.4 Usage Considerations

.1 Strengths

- Provides business analysts with a prescriptive approach for determining alternate options, especially in complex or uncertain situations.
- Helps stakeholders who are under pressure to assess options based on criteria, thus reducing decisions based on descriptive information and emotions.
- Requires stakeholders to honestly assess the importance they place on different alternate outcomes in order to help avoid false assumptions.
- Enables business analysts to construct appropriate metrics or introduce relative rankings for outcome evaluation in order to directly compare both the financial and non-financial outcome evaluation criteria.

.2 Limitations

- The information to conduct proper decision analysis may not be available in time to make the decision.
- Many decisions must be made immediately, without the luxury of employing a formal or even informal decision analysis process.
- The decision maker must provide input to the process and understand the assumptions and model limitations. Otherwise, they may perceive the results provided by the business analyst as more certain than they are.
- Analysis paralysis can occur when too much dependence is placed on the decision analysis and in determining probabilistic values.

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- Some decision analysis models require specialized knowledge (for example, mathematical knowledge in probability and strong skills with decision analysis tools).

10.17 Decision Modelling

10.17.1 Purpose

Decision modelling shows how repeatable business decisions are made.

10.17.2 Description

Decision models show how data and knowledge are combined to make a specific decision. Decision models can be used for both straightforward and complex decisions. Straightforward decision models use a single decision table or decision tree to show how a set of business rules that operate on a common set of data elements combine to create a decision. Complex decision models break down decisions into their individual components so that each piece of the decision can be separately described and the model can show how those pieces combine to make an overall decision. The information that needs to be available to make the decision and any sub-decisions can be decomposed. Each sub-decision is described in terms of the business rules required to make that part of the decision.

A comprehensive decision model is an overarching model that is linked to processes, performance measures, and organizations. It shows where the business rules come from and represents decisions as analytical insight.

The business rules involved in a given decision may be definitional or behavioural. For instance, a decision 'Validate order' might check that the tax amount is calculated correctly (a definitional rule) and that the billing address matches the credit card provided (a behavioural rule).

Decision tables and decision trees define how a specific decision is made. A graphical decision model can be constructed at various levels. A high-level model may only show the business decisions as they appear in business processes, while a more detailed model might show as-is or to-be decision making in enough detail to act as a structure for all the relevant business rules.

10.17.3 Elements

.1 Types of Models and Notations

There are several different approaches to decision modelling. Decision tables represent all the rules required to make an atomic decision. Decision trees are common in some industries, but are generally used much less often than decision tables. Complex decisions require the combination of multiple simple decisions into a network. This is shown using dependency or requirements notations.

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All of these approaches involve three key elements:

- decision,
- information, and
- knowledge.

Decision Tables

Business decisions use a specific set of input values to determine a particular outcome by using a defined set of business rules to select one from the available outcomes. A decision table is a compact, tabular representation of a set of these rules. Each row (or column) is a rule and each column (or row) represents one of the conditions of that rule. When all the conditions in a particular rule evaluate to true for a set of input data, the outcome or action specified for that rule is selected.

Decision tables generally contain one or more condition columns that map to specific data elements, as well as one or more action or outcome columns. Each row can contain a specific condition in each condition column. These are evaluated against the value of the data element being considered. If all the cells in a rule are either blank or evaluate to true, the rule is true and the result specified in the action or outcome column occurs.

Figure 10.17.1: Decision Table

Eligibility Rules		
Loan Amount	**Age**	**Eligibility**
<=1000	>18	Eligible
	<=18	Ineligible
1000–2000	>21	Eligible
	<=21	Ineligible
>2000	>=25	Eligible
	<25	Ineligible

Decision Trees

Decision trees are also used to represent a set of business rules. Each path on a decision tree leaf node is a single rule. Each level in the tree represents a specific data element; the downstream branches represent the different conditions that must be true to continue down that branch. Decision trees can be very effective for representing certain kinds of rule sets, especially those relating to customer segmentation.

As with decision tables, a decision tree selects one of the available actions or outcomes (a leaf node shown on the far right or bottom of the tree) based on the

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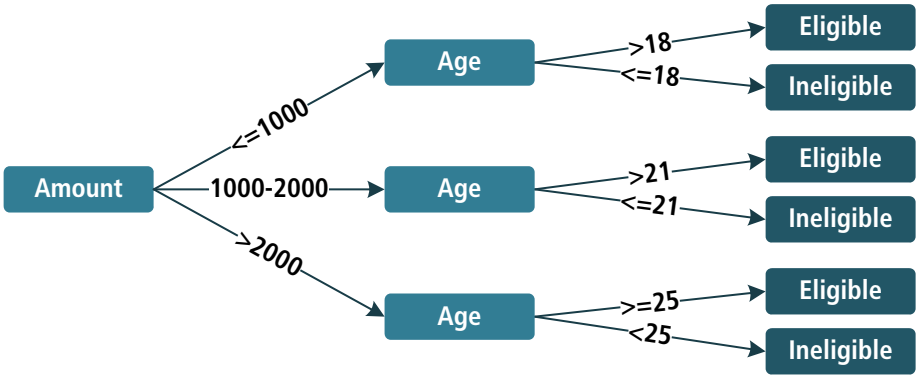
specific values passed to it by the data elements that represent the branching nodes.

In the following decision tree, the rules in the tree share conditions (represented by earlier nodes in the tree).

Figure 10.17.2: Decision Tree



Decision Requirements Diagrams

A decision requirements diagram is a visual representation of the information, knowledge, and decision making involved in a more complex business decision.

Decision requirement diagrams contain the following elements:

- **Decisions**: shown as rectangles. Each decision takes a set of inputs and selects from a defined set of possible outputs by applying business rules and other decision logic.
- **Input Data**: shown as ovals, representing data that must be passed as an input to a decision on the diagram.
- **Business Knowledge Models**: shown as a rectangle with the corners cut off, representing sets of business rules, decision tables, decision trees, or even predictive analytic models that describe precisely how to make a decision.
- **Knowledge Sources**: shown as a document, representing the original source documents or people from which the necessary decision logic can be or has been derived.

These nodes are linked together into a network to show the decomposition of complex decision making into simpler building blocks. Solid arrows show the information requirements for a decision. These information requirements might link input data to a decision, to show that this decision requires that data to be available, or might link two decisions together.

Business knowledge models which describe how to make a specific decision can be linked to that decision with dashed arrows to display knowledge requirements. Knowledge sources can be linked to decisions with a dashed, rounded arrow to show that a knowledge source (for example, a document or person) is an authority for the decision. This is called an authority requirement.

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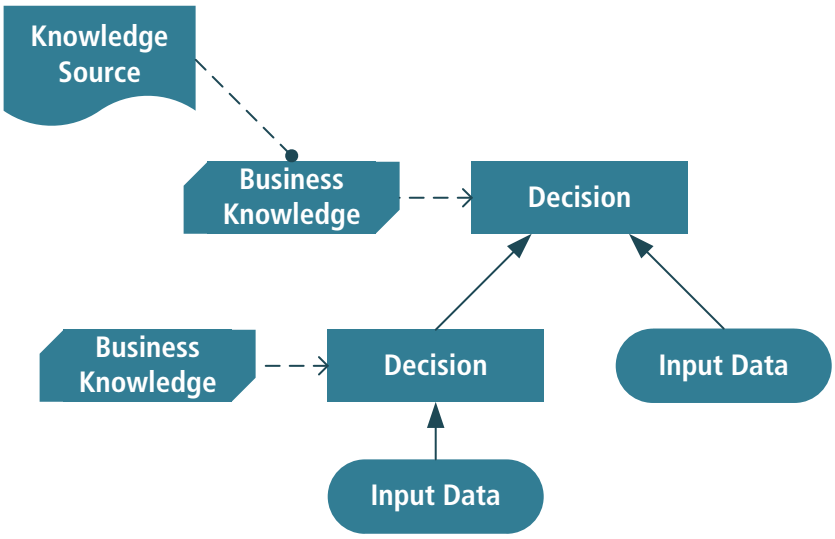
Figure 10.17.3: Decision Requirements Diagram



10.17.4 Usage Considerations

.1 Strengths

- Decision models are easy to share with stakeholders, facilitate a shared understanding, and support impact analysis.
- Multiple perspectives can be shared and combined, especially when a diagram is used.
- Simplifies complex decision making by removing business rules management from the process.
- Assists with managing large numbers of rules in decision tables by grouping rules by decision. This also helps with reuse.
- These models work for rules-based automation, data mining, and predictive analytics, as well as for manual decisions or business intelligence projects.

.2 Limitations

- Adds a second diagram style when modelling business processes that contain decisions.This may add unnecessary complexity if the decision is simple and tightly coupled with the process.
- May limit rules to those required by known decisions and so limit the capture of rules not related to a known decision.
- Defining decision models may allow an organization to think it has a standard way of making decisions when it does not. May lock an organization into a current-state decision-making approach.
- Cuts across organizational boundaries, which can make it difficult to acquire any necessary sign-off.
- May not address behavioural business rules in a direct fashion.

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- Business terminology must be clearly defined and shared definitions developed to avoid data quality issues affecting automated decisions.

10.18 Document Analysis

10.18.1 Purpose

Document analysis is used to elicit business analysis information, including contextual understanding and requirements, by examining available materials that describe either the business environment or existing organizational assets.

10.18.2 Description

Document analysis may be used to gather background information in order to understand the context of a business need, or it may include researching existing solutions to validate how those solutions are currently implemented. Document analysis may also be used to validate findings from other elicitation efforts such as interviews and observations. Data mining is one approach to document analysis that is used to analyze data in order to determine patterns, group the data into categories, and determine opportunities for change. The purpose, scope, and topics to be researched through document analysis are determined based on the business analysis information being explored. When performing document analysis, business analysts methodically review the materials and determine whether the information should be recorded within a work product.

Background research gathered through document analysis may include reviewing materials such as marketing studies, industry guidelines or standards, company memos, and organizational charts. By researching a wide variety of source materials, the business analyst can ensure the need is fully understood in terms of the environment in which it exists. Document analysis about an existing solution may include reviewing business rules, technical documentation, training documentation, problem reports, previous requirements documents, and procedure manuals in order to validate both how the current solution works and why it was implemented in its current form. Document analysis can also help address information gaps that may occur when the subject matter experts (SMEs) for the existing solution are no longer present or will not be available for the duration of the elicitation process.

10.18.3 Elements

.1 Preparation

Document analysis materials may originate from public or proprietary sources.

When assessing source documents for analysis, business analysts consider:

- whether or not the source's content is relevant, current, genuine, and credible,

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- whether or not the content is understandable and can be easily conveyed to stakeholders as needed, and
- defining both the data to be mined (based on the classes of data needed) and the data clusters that provide items grouped by logical relationships.

.2 Document Review and Analysis

Performing document analysis includes:

- Conducting a detailed review of each document's content and recording relevant notes associated with each topic. Notes can be recorded using a document analysis chart that includes the topic, type, source, verbatim details, a paraphrased critique, and any follow-up issues or actions for each document that is reviewed.
- Identifying if any notes conflict or are duplicates.
- Noting any gaps in knowledge in which the findings about certain topics are limited. It may be necessary to perform additional research to revisit these topics, or to drill down at a sub-topic level.

.3 Record Findings

When the information elicited through document analysis is used in a work product, the business analyst considers:

- if the content and level of detail is appropriate for the intended audience, and
- if the material should be transformed into visual aids such as graphs, models, process flows, or decision tables in order to help improve understanding.

10.18.4 Usage Considerations

.1 Strengths

- Existing source material may be used as a basis for analysis.
- The business analyst does not need to create content.
- Existing sources, although possibly outdated, can be used as a point of reference to determine what is current and what has changed.
- Results can be used to validate against the results of other requirements elicitation techniques.
- Findings can be presented in formats that permit ease of review and reuse.

.2 Limitations

- Existing documentation may be out of date or invalid (incorrect, missing information, unreadable, unreviewed or unapproved).
- Authors may not be available for questions.

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- Primarily helpful only for evaluating the current state, via review of as-is documentation.
- If there is a wide range of sources, the effort may be very time-consuming and lead to information overload and confusion.

10.19 Estimation

10.19.1 Purpose

Estimation is used by business analysts and other stakeholders to forecast the cost and effort involved in pursuing a course of action.

10.19.2 Description

Estimation is used to support decision making by predicting attributes such as:

- cost and effort to pursue a course of action,
- expected solution benefits,
- project cost,
- business performance,
- potential value anticipated from a solution, and
- costs of creating a solution,
- costs of operating a solution,
- potential risk impact.

The result of estimation is sometimes expressed as a single number. Representing the results of estimation as a range, with minimum and maximum values along with probability, may present a higher degree of effectiveness for stakeholders. This range is referred to as a confidence interval and serves as a measure of the level of uncertainty. The less information that is available to the estimator, the wider the confidence interval will be.

Estimation is an iterative process. Estimates are reviewed as more information becomes available, and are also revised (if appropriate). Many estimation techniques rely on historical performance records from the organization in order to calibrate estimates against prior experience. Each estimate can include an assessment of its associated level of uncertainty.

10.19.3 Elements

.1 Methods

Various methods of estimation are used for specific situations. In each case it is important for the estimators to have an agreed-upon description of the elements to be estimated, often in the form of a work breakdown structure or some other decomposition of all the work being estimated. When developing and delivering an estimate, constraints and assumptions also need to be clearly communicated.

Common estimation methods include:

- **Top-down**: examining the components at a high level in a hierarchical breakdown.

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- **Bottom-up**: using the lowest-level elements of a hierarchical breakdown to examine the work in detail and estimate the individual cost or effort, and then summing across all elements to provide an overall estimate.
- **Parametric Estimation**: use of a calibrated parametric model of the element attributes being estimated. It is important that the organization uses its own history to calibrate any parametric model, since the attribute values reflect the skills and abilities of both its staff and the processes used to do work.
- **Rough Order of Magnitude (ROM)**: a high-level estimate, generally based on limited information, which may have a very wide confidence interval.
- **Rolling Wave**: repeated estimates throughout an initiative or project, providing detailed estimates for near-term activities (such as an iteration of the work) extrapolated for the remainder of the initiative or project.
- **Delphi**: uses a combination of expert judgment and history. There are several variations on this process, but they all include individual estimates, sharing the estimates with experts, and having several rounds of estimation until consensus is reached. An average of the three estimates is used.
- **PERT**: each component of the estimate is given three values: (1) Optimistic value, representing the best-case scenario, (2) Pessimistic value, representing the worst-case scenario, (3) Most Likely value. Then a PERT value for each estimated component is computed as a weighted average: (Optimistic + Pessimistic + (4 times Most Likely))/6.

.2 Accuracy of the Estimate

The accuracy of an estimate is a measure of uncertainty that evaluates how close an estimate is to the actual value measured later. It can be calculated as a ratio of the width of the confidence interval to its mean value and then expressed as a percentage. When there is little information, such as early in the development of a solution approach, a Rough Order of Magnitude (ROM) estimate is delivered, which is expected to have a wide range of possible values and a high level of uncertainty.

ROM estimates are often no more than +50% to -50% accurate. A definitive estimate, which is much more accurate, can be made as long as more real-world data is collected. Definitive estimates that are used for predicting timelines, final budgets, and resource needs should ideally be accurate within 10% or less.

Teams can combine the use of ROM estimates and definitive estimates throughout a project or initiative using rolling wave estimates. A team creates a definitive estimate for the next iteration or phase (for which they have adequate information), while the remainder of the work is given a ROM estimate. As the end of the iteration or phase approaches, a definitive estimate is made for the work of the next iteration or phase and the ROM estimate for remaining activities is refined.

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.3 Sources of Information

Estimators consider available information from prior experience along with the attributes being estimated.

Some common sources of information include:

- **Analogous Situations**: using an element (project, initiative, risk, or other) that is like the element being estimated.
- **Organization History**: previous experiences of the organization with similar work. This is most helpful if the prior work was done by the same or a similarly-skilled team and by using the same techniques.
- **Expert Judgment**: leveraging the knowledge of individuals about the element being estimated. Estimating often relies on the expertise of those who have performed the work in the past, internal or external to the organization. When using external experts, estimators take into account the relevant skills and abilities of those doing the work being estimated.

.4 Precision and Reliability of Estimates

When multiple estimates are made for a particular attribute, the precision of the resulting estimate is a measure of agreement between the estimates (how close they are to each other). By examining measures of imprecision such as variance or standard deviation, estimators can determine their level of agreement.

The reliability of an estimate (its repeatability) is reflected in the variation of estimates made by different methods of estimating or by different estimators.

To illustrate the level of reliability and precision, an estimate is often expressed as a range of values with an associated confidence level. That is, for a given summary estimate value and confidence level, the range of values is the expected range of possible values based on the estimates provided. For example, if a team estimated that some task would take 40 hours, a 90% confidence interval might be 36 to 44 hours, depending on what they gave as individual estimates. A 95% confidence interval might be 38 to 42 hours. In general, the higher the confidence level in the estimate, the narrower the range would be.

To provide estimates with a particular level of confidence, estimators can use a technique such as PERT. Using the multiple estimates for each component of the estimate, a probability distribution can be constructed. This distribution provides a way to compute an overall estimate (incorporating all of the estimated elements) as a range of values, with an associated level of confidence.

.5 Contributors to Estimates

The estimators of an element are frequently those responsible for that element. The estimate of a team is usually more accurate than the estimate of one individual, since it incorporates the expertise of all team members.

In some cases, an organization has a group that performs estimation for much of the work of the organization. This is done with care, so that the estimate reflects the likely context of the element being estimated.

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When an organization needs a high level of confidence in the estimate of some critical element, it may call on an external expert to perform or review the estimate. The organization may compare an independent estimate against their internal estimate to determine what adjustments may be needed.

10.19.4 Usage Considerations

.1 Strengths

- Estimates provide a rationale for an assigned budget, time frame, or size of a set of elements.
- Without an estimate, teams making a change may be provided an unrealistic budget or schedule for their work.
- Having a small team of knowledgeable individuals provide an estimate by following a defined technique generally results in a closer predictor of the actual value than if an estimate was made by one individual.
- Updating an estimate throughout a work cycle, in which the estimated elements are refined over time, incorporates knowledge and helps ensure success.

.2 Limitations

- Estimates are only as accurate as the level of knowledge about the elements being estimated. Without organization or local knowledge, estimates can vary widely from the actual values determined later.
- Using just one estimation method may lead stakeholders to have unrealistic expectations.

10.20 Financial Analysis

10.20.1 Purpose

Financial analysis is used to understand the financial aspects of an investment, a solution, or a solution approach.

10.20.2 Description

Financial analysis is the assessment of the expected financial viability, stability, and benefit realization of an investment option. It includes a consideration of the total cost of the change as well as the total costs and benefits of using and supporting the solution.

Business analysts use financial analysis to make a solution recommendation for an investment in a specific change initiative by comparing one solution or solution approach to others, based on analysis of the:

- initial cost and the time frame in which those costs are incurred,
- expected financial benefits and the time frame in which they will be incurred,
- ongoing costs of using the solution and supporting the solution,

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- risks associated with the change initiative, and
- ongoing risks to business value of using that solution.

A combination of analysis techniques are typically used because each provides a different perspective. Executives compare the financial analysis results of one investment option with that of other possible investments to make decisions about which change initiatives to support.

Financial analysis deals with uncertainty, and as a change initiative progresses through its life cycle, the effects of that uncertainty become better understood. Financial analysis is continuously applied during the initiative to determine if the change is likely to deliver enough business value such that it should continue. A business analyst may recommend that a change initiative be adjusted or stopped if new information causes the financial analysis results to no longer support the initial solution recommendation.

10.20.3 Elements

.1 Cost of the Change

The cost of a change includes the expected cost of building or acquiring the solution components and the expected costs of transitioning the enterprise from the current state to the future state. This could include the costs associated with changing equipment and software, facilities, staff and other resources, buying out existing contracts, subsidies, penalties, converting data, training, communicating the change, and managing the roll out. These costs may be shared between organizations within the enterprise.

.2 Total Cost of Ownership (TCO)

The total cost of ownership (TCO) is the cost to acquire a solution, the cost of using the solution, and the cost of supporting the solution for the foreseeable future, combined to help understand the potential value of a solution. In the case of equipment and facilities, there is often a generally agreed to life expectancy. However, in the case of processes and software, the life expectancy is often unknown. Some organizations assume a standard time period (for example, three to five years) to understand the costs of ownership of intangibles like processes and software.

.3 Value Realization

Value is typically realized over time. The planned value could be expressed on an annual basis, or could be expressed as a cumulative value over a specific time period.

.4 Cost-Benefit Analysis

Cost-benefit analysis (sometimes called benefit-cost analysis) is a prediction of the expected total benefits minus the expected total costs, resulting in an expected net benefit (the planned business value).

Assumptions about the factors that make up the costs and benefits should be clearly stated in the calculations so they can be reviewed, challenged and

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approved. The costs and benefits will often be estimated based on those assumptions, and the estimating methodology should be described so that it can be reviewed and adjusted if necessary.

The time period of a cost-benefit analysis should look far enough into the future that the solution is in full use, and the planned value is being realized. This will help to understand which costs will be incurred and when, and when the expected value should be realized.

Table 10.20.1: Example of a Cost-Benefit Analysis

	Year 0	Year 1	Year 2	Year 3
Expected Benefits				
Revenue		$XXXX	$XXXX	$XXXX
Reduced operating costs		$XXXX	$XXXX	$XXXX
Time savings		$XXXX	$XXXX	$XXXX
Reduced cost of errors		$XXXX	$XXXX	$XXXX
Increased customer satisfaction		$XXXX	$XXXX	$XXXX
Decreased cost of compliance		$XXXX	$XXXX	$XXXX
Other		$XXXX	$XXXX	$XXXX
Total Annual benefits	**$0**	**$XXXX**	**$XXXX**	**$XXXX**
Costs				
Project costs	$XXXX	$XXXX	$0	$0
Ongoing support	$0	$XXXX	$XXXX	$XXXX
New facilities	$XXXX	$0	$0	$XXXX
Licensing	$0	$XXXX	$XXXX	$XXXX
Infrastructure renewal	$XXXX	$0	$XXXX	$0
Other	$0	$XXXX	$0	$XXXX
Total Costs	**$XXXX**	**$XXXX**	**$XXXX**	**$XXXX**
Net Benefits	**-$XXXX**	**$XXXX**	**$XXXX**	**$XXXX**
Cumulative Net Benefits	**-$XXXX**	**-$XXXX**	**-$XXXX**	**$XXXX**

Some benefits may not be realized until future years. Some project and operating costs may be recognized in future years. The cumulative net benefits could be negative for some time until the future.

In some organizations, all or part of the costs associated with the change may be amortized over several years, and the organization may require the cost-benefit

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analysis to reflect this.

During a change initiative, as the expected costs become real costs, the business analyst may re-examine the cost-benefit analysis to determine if the solution or solution approach is still viable.

.5 Financial Calculations

Organizations use a combination of standard financial calculations to understand different perspectives about when and how different investments deliver value. These calculations take into consideration the inherent risks in different investments, the amount of upfront money to be invested compared to when the benefits will be realized, a comparison to other investments the organization could make, and the amount of time it will take to recoup the original investment.

Financial software, including spreadsheets, typically provide pre-programmed functions to correctly perform these financial calculations.

Return on Investment

The return on investment (ROI) of a planned change is expressed as a percentage measuring the net benefits divided by the cost of the change. One change initiative, solution, or solution approach may be compared to that of others to determine which one provides the greater overall return relative to the amount of the investment.

The formula to calculate ROI is:

> *Return on Investment = (Total Benefits – Cost of the Investment) / Cost of the Investment.*

The higher the ROI, the better the investment.

When making a comparison between potential investments, the business analyst should use the same time period for both.

Discount Rate

The discount rate is the assumed interest rate used in present value calculations. In general, this is similar to the interest rate that the organization would expect to earn if it invested its money elsewhere. Many organizations use a standard discount rate, usually determined by its finance officers, to evaluate potential investments such as change initiatives using the same assumptions about expected interest rates. Sometimes a larger discount rate is used for time periods that are more than a few years into the future to reflect greater uncertainty and risk.

Present Value

Different solutions and different solution approaches could realize benefits at different rates and over a different time. To objectively compare the effects of these different rates and time periods, the benefits are calculated in terms of

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present-day value. The benefit to be realized sometime in the future is reduced by the discount rate to determine its worth today.

The formula to calculate present value is:

Present Value = Sum of (Net Benefits in that period / (1 + Discount Rate for that period)) for all periods in the cost-benefit analysis.

Present value is expressed in currency. The higher the present value, the greater the total benefit.

Present value does not consider the cost of the original investment.

Net Present Value

Net present value (NPV) is the present value of the benefits minus the original cost of the investment. In this way, different investments, and different benefit patterns can be compared in terms of present day value. The higher the NPV, the better the investment.

The formula to calculate net present value is:

Net Present Value = Present Value – Cost of Investment

Net present value is expressed in currency. The higher the NPV, the better the investment.

Internal Rate of Return

The internal rate of return (IRR) is the interest rate at which an investment breaks even, and is usually used to determine if the change, solution or solution approach is worth investing in. The business analyst may compare the IRR of one solution or solution approach to a minimum threshold that the organization expects to earn from its investments (called the hurdle rate). If the change initiative's IRR is less than the hurdle rate, then the investment should not be made.

Once the planned investment passes the hurdle rate, it could be compared to other investments of the same duration. The investment with the higher IRR would be the better investment. For example, the business analyst could compare two solution approaches over the same time period, and would recommend the one with the higher IRR.

The IRR is internal to one organization since it does not consider external influencers such as inflation or fluctuating interest rates or a changing business context.

The IRR calculation is based on the interest rate at which the NPV is 0:

Net Present Value = (-1 x Original Investment) + Sum of (net benefit for that period / (1 + IRR) for all periods) = 0.

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Payback Period

The payback period provides a projection on the time period required to generate enough benefits to recover the cost of the change, irrespective of the discount rate. Once the payback period has passed the initiative would normally show a net financial benefit to the organization, unless operating costs rise. There is no standard formula for calculating the payback period. The time period is usually expressed in years or years and months.

10.20.4 Usage Considerations

.1 Strengths

- Financial analysis allows executive decision makers to objectively compare very different investments from different perspectives.
- Assumptions and estimates built into the benefits and costs, and into the financial calculations, are clearly stated so that they may be challenged or approved.
- It reduces the uncertainty of a change or solution by requiring the identification and analysis of factors that will influence the investment.
- If the context, business need, or stakeholder needs change during a change initiative, it allows the business analyst to objectively re-evaluate the recommended solution.

.2 Limitation

- Some costs and benefits are difficult to quantify financially.
- Because financial analysis is forward looking, there will always be some uncertainty about expected costs and benefits
- Positive financial numbers may give a false sense of security—they may not provide all the information required to understand an initiative.

10.21 Focus Groups

10.21.1 Purpose

A focus group is a means to elicit ideas and opinions about a specific product, service, or opportunity in an interactive group environment. The participants, guided by a moderator, share their impressions, preferences, and needs.

10.21.2 Description

A focus group is composed of pre-qualified participants whose objective is to discuss and comment on a topic within a context. The participants share their perspectives and attitudes about a topic and discuss them in a group setting. This

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sometimes leads participants to re-evaluate their own perspectives in light of others' experiences. A trained moderator manages the preparation of the session, assists in selecting participants, and facilitates the session. If the moderator is not the business analyst, he/she may work with the business analyst to analyze the results and produce findings that are reported to the stakeholders. Observers may be present during the focus group session, but do not typically participate.

A focus group can be utilized at various points in an initiative to capture information or ideas in an interactive manner. If the group's topic is a product under development, the group's ideas are analyzed in relationship to the stated requirements. This may result in updating existing requirements or uncovering new requirements. If the topic is a completed product that is ready to be launched, the group's report could influence how to position the product in the market. If the topic is a product in production, the group's report may provide direction on the revisions to the next release of requirements. A focus group may also serve as a means to assess customer satisfaction with a product or service.

A focus group is a form of qualitative research. The activities are similar to that of a brainstorming session, except that a focus group is more structured and focused on the participants' perspectives concerning a specific topic. It is not a interview session conducted as a group; rather, it is a discussion during which feedback is collected on a specific subject. The session results are usually analyzed and reported as themes and perspectives rather than numerical findings.

10.21.3 Elements

.1 Focus Group Objective

A clear and specific objective establishes a defined purpose for the focus group. Questions are formulated and discussions are facilitated with the intent of meeting the objective.

.2 Focus Group Plan

The focus group plan ensures that all stakeholders are aware of the purpose of the focus group and agree on the expected outcomes, and that the session meets the objectives.

The focus group plan defines activities that include:

- **Purpose**: creating questions that answer the objective, identifying key topics to be discussed, and recommending whether or not discussion guides will be used.
- **Location**: identifying whether the session will be in-person or online, as well as which physical or virtual meeting place will be used.
- **Logistics**: identifying the size and set up of the room, other facilities that may be required, public transportation options, and the time of the session.
- **Participants**: identifying the demographics of those actively engaged in the discussion, if any observers are required, and who the moderators and

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recorders will be. Consideration may also be given to incentives for participants.

- **Budget**: outlining the costs of the session and ensuring that resources are allocated appropriately.
- **Timelines**: establishing the period of time when the session or sessions will be held, as well as when any reports or analysis resulting from the focus group are expected.
- **Outcomes**: identifying how the results will be analyzed and communicated and the intended actions based on the results.

.3 Participants

A successful focus group session has participants who are willing to both offer their insights and perspectives on a specific topic and listen to the opinions of the other participants. A focus group typically has 6 to 12 attendees. It may be necessary to invite additional individuals to compensate for those who do not attend the session due to scheduling conflicts, emergencies, or other reasons. If many participants are needed, it may be necessary to run more than one focus group. Often participants of a focus group are paid for their time.

The demographics of the participants are determined based on the objective of the focus group.

.4 Discussion Guide

A discussion guide provides the moderator with a prepared script of specific questions and topics for discussion that meet the objective of the session.

Discussion guides also include the structure or framework that the moderator will follow. This includes obtaining general feedback and comments before delving into specifics. Discussion guides also remind the moderator to welcome and introduce the participants, as well as to explain the objectives of the session, how the session will be conducted, and how the feedback will be used.

.5 Assign a Moderator and Recorder

The moderator is both skilled at keeping the session on track and knowledgeable about the initiative. Moderators are able to engage all participants and are adaptable and flexible. The moderator is an unbiased representative of the feedback process.

The recorder takes notes to ensure the participant's opinions are accurately recorded.

The business analyst can fill the role of either the moderator or the recorder. The moderator and recorder are not considered active participants in the focus group session and do not submit feedback.

.6 Conduct the Focus Group

The moderator guides the group's discussion, follows a prepared script of specific issues, and ensures that the objectives are met. However, the group discussion

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should appear free-flowing and relatively unstructured to the participants. A session is typically one to two hours in length. A recorder captures the group's comments.

.7 After the Focus Group

The results of the focus group are transcribed as soon as possible after the session has ended. The business analyst analyzes and documents the participants' agreements and disagreements, looks for trends in the responses, and creates a report that summarizes the results.

10.21.4 Usage Considerations

.1 Strengths

- The ability to elicit data from a group of people in a single session saves both time and costs as compared to conducting individual interviews with the same number of people.
- Effective for learning people's attitudes, experiences, and desires.
- Active discussion and the ability to ask others questions creates an environment in which participants can consider their personal view in relation to other perspectives.
- An online focus group is useful when travel budgets are limited and participants are distributed geographically.
- Online focus group sessions can be recorded easily for playback.

.2 Limitations

- In a group setting, participants may be concerned about issues of trust or may be unwilling to discuss sensitive or personal topics.
- Data collected about what people say may not be consistent with how people actually behave.
- If the group is too homogeneous their responses may not represent the complete set of requirements.
- A skilled moderator is needed to manage group interactions and discussions.
- It may be difficult to schedule the group for the same date and time.
- Online focus groups limit interaction between participants.
- It is difficult for the moderator of an online focus group to determine attitudes without being able to read body language.
- One vocal participant could sway the results of the focus group.

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10.22 Functional Decomposition

10.22.1 Purpose

Functional decomposition helps manage complexity and reduce uncertainty by breaking down processes, systems, functional areas, or deliverables into their simpler constituent parts and allowing each part to be analyzed independently.

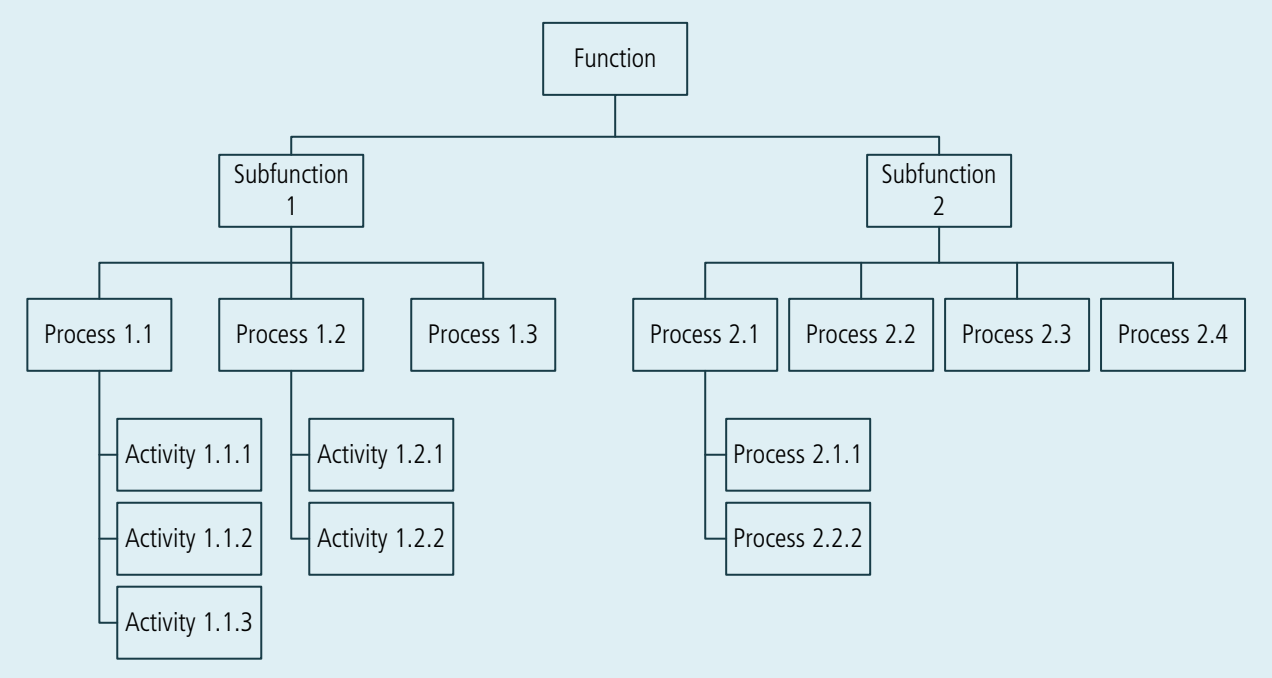
10.22.2 Description

Functional decomposition approaches the analysis of complex systems and concepts by considering them as a set of collaborating or related functions, effects, and components. This isolation helps reduce the complexity of the analysis. Breaking down larger components into sub-components allows scaling, tracking, and measuring work effort for each of them. It also facilitates evaluation of the success of each sub-component as it relates to other larger or smaller components.

The depth of decomposition may vary depending on the nature of components and objectives. Functional decomposition assumes that sub-components can and do completely describe their parent components. Any sub-component can have only one parent component when developing the functional hierarchy.

The diagram below provides an example of how a function can be broken down to manageable, measurable sub-components.

Figure 10.22.1: Functional Decomposition Diagram



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10.22.3 Elements

.1 Decomposition Objectives

Objectives of functional decomposition both drive the process of decomposition and define what to decompose, how to decompose, and how deeply to decompose.

The objectives may include:

- **Measuring and Managing**: to isolate specific manageable factors that contribute to the overall result, or to identify important metrics and indicators.
- **Designing**: to simplify a design problem by reducing and isolating the object of design.
- **Analyzing**: to study the essential properties and behaviours of an artifact or phenomenon in isolation from its encompassing environment.
- **Estimating and Forecasting**: to decrease the level of uncertainty by breaking down a complex value into its constituent factors.
- **Reusing**: to create a reusable solution building block that serves a specific function for various processes.
- **Optimization**: to detect or alleviate a bottleneck, reduce function cost, or improve process quality.
- **Substitution**: to make a specific implementation of a solution component or a function easily replaceable without impacting the system as a whole.
- **Encapsulation**: combining elements to make one element.

.2 Subjects of Decomposition

Functional decomposition applies to a wide variety of versatile subjects, such as:

- **Business Outcomes**: for example, income, profit, expenses, volume of service, or volume of production.
- **Work to be Done**: this decomposition (known as a Work Breakdown Structure or WBS) breaks endeavours into phases, milestones, work activities, tasks, work items, and deliverables.
- **Business Process**: to identify its constituent parts for the purposes of measuring, managing, optimizing, or reusing the process or its components.
- **Function**: to enable its optimization or implementation.
- **Business Unit**: to enable its reverse engineering and design.
- **Solution Component**: to enable its design, implementation, or change.
- **Activity**: to enable its implementation, modification, optimization, measurement, and estimation.
- **Products and Services**: to design, implement, and improve them.

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- **Decisions**: for enabling, improving, or supporting them by identifying their inputs, underlying models, dependencies, and outcomes.

.3 Level of Decomposition

The appropriate level of functional decomposition defines where, why, and when to stop decomposing the subject in order to meet the analysis objectives. The process of functional decomposition continues until the business analyst has just enough understanding and detail to proceed and can apply the results of decomposition in the execution of other tasks.

.4 Representation of Decomposition Results

Representations of functional decomposition results allow business analysts to both validate and verify the results and to use them to solve other tasks. The results can be expressed as a combination of plain textual descriptions, hierarchical lists, descriptions using special formal notations (for example, mathematical formulas, Business Process Execution Language, or programming languages), and visual diagrams. A wide variety of diagramming techniques can be used to represent functional decomposition, including:

- **Tree diagrams**: represent hierarchical partitioning of work, activities, or deliverables.
- **Nested diagrams**: illustrate hierarchical part-to-whole relationships between decomposition results.
- **Use Case diagrams**: represent decomposition of a higher-level use case.
- **Flow diagrams**: depict results of a process or function decomposition.
- **State Transition diagrams**: explain the behaviour of an object inside its composite state.
- **Cause-Effect diagrams**: elaborate on events, conditions, activities, and effects involved in producing a complex outcome or phenomenon.
- **Decision Trees**: detail the structure of a complex decision and its potential outcomes.
- **Mind Maps**: represent information in categories.
- **Component diagram**: depicts how components are wired together to form larger components and/or software systems.
- **Decision Model and Notation**: is used to analyze the business logic to ensure that it has inferential and business integrity.

10.22.4 Usage Considerations

.1 Strengths

- Makes complex endeavours possible by breaking down complex problems into feasible parts.

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- Provides a structured approach to building a shared understanding of complex matters among a diverse group of stakeholders.
- Simplifies measurement and estimation of the amount of work involved in pursuing a course of action, defining scope of work, and defining process metrics and indicators.

.2 Limitations

- Missing or incorrect information at the time decomposition is performed may later cause a need to revise the results of decomposition partially or entirely.
- Many systems cannot be fully represented by simple hierarchical relationships between components because the interactions between components cause emergent characteristics and behaviours.
- Every complex subject allows multiple alternative decompositions. Exploring all alternatives can be a challenging and time-consuming task, while sticking with a single alternative may disregard important opportunities and result in a sub-optimal solution.
- Performing functional decomposition may involve deep knowledge of the subject and extensive collaboration with diverse stakeholders.

10.23 Glossary

10.23.1 Purpose

A glossary defines key terms relevant to a business domain.

10.23.2 Description

Glossaries are used to provide a common understanding of terms that are used by stakeholders. A term may have different meanings for any two people. A list of terms and established definitions provides a common language that can be used to communicate and exchange ideas. A glossary is organized and continuously accessible to all stakeholders.

10.23.3 Elements

A glossary is a list of terms in a particular domain with definitions for those terms and their common synonyms. Organizations or industries may use a term differently than how it is generally understood.

A term is included in the glossary when:

- the term is unique to a domain,
- there are multiple definitions for the term,
- the definition implied is outside of the term's common use, or
- there is a reasonable chance of misunderstanding.

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The creation of a glossary should take place in the early stages of a project in order to facilitate knowledge transfer and understanding. A point of contact responsible for the maintenance and distribution of the glossary throughout the initiative is identified. Organizations that maintain glossaries often find additional uses for this information and are able to leverage the glossary for future initiatives.

Consider the following when developing a glossary:

- definitions should be clear, concise, and brief,
- acronyms should be spelled out if used in a definition,
- stakeholders should have easy and reliable access to glossaries, and
- the editing of a glossary should be limited to specific stakeholders.

10.23.4 Usage Considerations

.1 Strengths

- A glossary promotes common understanding of the business domain and better communication among all stakeholders.
- Capturing the definitions as part of an enterprise's documentation provides a single reference and encourages consistency.
- Simplifies the writing and maintenance of other business analysis information including but not limited to requirements, business rules, and change strategy.

.2 Limitations

- A glossary requires an owner to perform timely maintenance, otherwise it becomes outdated and may be ignored.
- It may be challenging for different stakeholders to agree on a single definition for a term.

10.24 Interface Analysis

10.24.1 Purpose

Interface analysis is used to identify where, what, why, when, how, and for whom information is exchanged between solution components or across solution boundaries.

10.24.2 Description

An interface is a connection between two components or solutions. Most solutions require one or more interfaces to exchange information with other solution components, organizational units, or business processes.

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Interface types include:

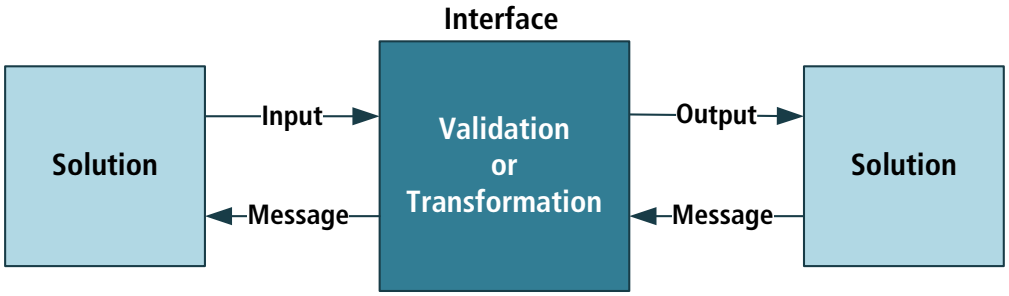
- user interfaces, including human users directly interacting with the solution within the organization,
- people external to the solution such as stakeholders or regulators,
- business processes,
- data interfaces between systems,
- application programming interfaces (APIs), and
- any hardware devices.

Interface analysis defines and clarifies the following:

- who will use the interface,
- what information is being exchanged through the interface, as well as the volume of the data,
- when information will be exchanged and how frequently,
- where the information exchange will occur,
- why the interface is needed, and
- how the interface is or should be implemented.

The early identification of interfaces allows the business analyst to provide the context for eliciting more detailed stakeholder requirements, thus determining adequate functional coverage of the solution to meet stakeholder needs. Early identification of interfaces reveals which stakeholders will benefit from or depend on the various components of the solution, which can help the business analyst determine which stakeholders should be present for other elicitation techniques.

Figure 10.24.1: Interface Analysis



10.24.3 Elements

.1 Preparing for Identification

The business analyst can leverage other techniques, such as document analysis, observation, scope modelling, and interviews, in order to understand which interfaces need to be identified. A context diagram can reveal high-level

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interfaces between human actors, organizational units, business processes, or other solution components. The results of this analysis can reveal how frequently any existing interfaces are being used and any problems with them that may strengthen the case for change. The results may also help identify any key issues that need to be resolved in order for an interface solution to be created.

.2 Conduct Interface Identification

Business analysts identify what interfaces are needed in the future state for each stakeholder or system that interacts with the system. The relationship between stakeholders and interfaces can be many-to-many or, in some cases, one-to-one. Some interfaces may be less obvious or less frequent such as an interface used for regulatory functions or auditing, or for employee training. Identified interfaces can include interfaces from solutions other than the operational solution.

For each interface, business analysts:

- describe the function of the interface,
- assess the frequency of the interface usage,
- evaluate which type of interface may be appropriate, and
- elicit initial details about the interface.

.3 Define Interfaces

Requirements for an interface are primarily focused on describing the inputs to and outputs from that interface, any validation rules that govern those inputs and outputs, and events that might trigger interactions. There may be a large number of possible interaction types, each of which needs to be specified. Interactions may be triggered by the typical or alternate flow of inputs and outputs in the business solution, or by exceptional events such as failures.

Business analysts consider who will use the interface, what information is passed over the interface, and when and where the interface takes place. The interface defines user workflow between systems, user roles and privileges, and any management objectives for the interface. Interface definition is dependent upon usability guidelines, such as accessibility requirements or general workflow requirements.

In order to identify any major design issues, interfaces between solution or process components and people require detailed analysis of the interface to be conducted upfront. Interface definition includes:

- the name of the interface,
- the coverage or span of the interface,
- the exchange method between the two entities,
- the message format, and
- the exchange frequency.

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10.24.4 Usage Considerations

.1 Strengths

- By engaging in interface analysis early on, increased functional coverage is provided.
- Clear specification of the interfaces provides a structured means of allocating requirements, business rules, and constraints to the solution.
- Due to its broad application, it avoids over analysis of fine detail.

.2 Limitations

- Does not provide insight into other aspects of the solution since the analysis does not assess the internal components.

10.25 Interviews

10.25.1 Purpose

An interview is a systematic approach designed to elicit business analysis information from a person or group of people by talking to the interviewee(s), asking relevant questions, and documenting the responses. The interview can also be used for establishing relationships and building trust between business analysts and stakeholders in order to increase stakeholder involvement or build support for a proposed solution.

10.25.2 Description

The interview is a common technique for eliciting requirements. It involves direct communication with individuals or groups of people who are part of an initiative.

In an interview, the interviewer directs questions to stakeholders in order to obtain information. One-on-one interviews are the most common. In a group interview (with more than one interviewee in attendance), the interviewer is careful to elicit responses from each participant.

There are two basic types of interviews used to elicit business analysis information:

- **Structured Interview**: in which the interviewer has a predefined set of questions.
- **Unstructured Interview**: in which the interviewer does not have a predetermined format or order of questions. Questions may vary based on interviewee responses and interactions.

In practice, business analysts may use a combination of the two types by adding, dropping, and varying the order of questions as needed.

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Successful interviewing depends on factors such as:

- level of understanding of the domain by the interviewer,
- experience of the interviewer in conducting interviews,
- skill of the interviewer in documenting discussions,
- readiness of the interviewee to provide the relevant information and the interviewer to conduct the interview,
- degree of clarity in the interviewee's mind about the goal of the interview, and
- rapport of the interviewer with the interviewee.

10.25.3 Elements

.1 Interview Goal

When planning interviews, business analysts consider:

- the overall purpose of performing a set of interviews, based on a business need, and
- the individual goals for each interview, based on what the interviewee can provide.

The goals are to be clearly expressed and communicated to each interviewee.

.2 Potential Interviewees

Potential interviewees are identified with the help of the project manager, project sponsors, and other stakeholders, based on the goals for the interview.

.3 Interview Questions

Interview questions are designed according to the interview goals, such as:

- collecting data,
- researching the stakeholder's view of the change or proposed solution,
- developing a proposed solution, or
- building rapport with or support for the proposed solution from the interviewee.

Open-ended questions are used to elicit a dialogue or series of steps and cannot be answered in a yes or no fashion. Open-ended questions are a good tool to allow the interviewee to provide information of which the interviewer may be unaware.

Closed questions are used to elicit a single response such as yes, no, or a specific number. Closed questions can be used to clarify or confirm a previous answer.

The interview questions are often organized based on priority and significance. Examples of question order include general to specific, start to finish, and detailed to summary. Questions can also be organized based on factors such as the interviewee's level of knowledge and the subject of the interview.

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Interview questions may be customized when the purpose of the interview is to gather information that is unique to the perspective of the interviewee. Standardized questions may be used when the interview results will be summarized and analyzed, such as when interview results will be tallied using a check sheet.

Interview questions can be compiled in an interview guide, which includes the interview questions, proposed timing, and follow-up questions. This will all be based on the interview type, according to the interview goals, mode of communication, and duration. The interview guide can be a document where the interviewee's responses are easily recorded. The interview guide should identify which interview questions may be omitted based upon time constraints.

.4 Interview Logistics

Ensuring a successful interview requires attention to logistics that include:

- The location for the interview. The interview is adapted to the schedule and availability of the interviewee and the mode of communication (in-person, phone, or online conferencing).
- Whether or not to record the interview, which may require the use of a scribe.
- Whether or not to send the questions to the interviewees in advance. Sending questions in advance is advisable only when the interviewee needs to collect information to prepare for the interview.
- Whether the interview results will be confidential and, if so, how the results will be summarized to avoid identifying individual interviewees.

.5 Interview Flow

Opening the interview includes:

- describing the purpose of the interview, including why the interviewees' time is needed,
- confirming the interviewees' roles and addressing any initial concerns raised by the interviewees, and
- explaining how information from the interview will be recorded and shared with the interviewees and other stakeholders during the project.

During the interview, the interviewer:

- maintains focus on the established goals and predefined questions, and adapts based upon the information provided and non-verbal communication from the interviewees,
- considers both the willingness of the interviewees to participate in the interview and to provide the required information,
- considers that several meetings might be required to conduct the entire interview,
- manages concerns raised by the interviewees by addressing them during the interview or documenting them for follow-up,

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- practices active listening to confirm what the interviewer has said, and
- takes written notes or records the interview as appropriate.

Closing the interview includes:

- asking the interviewees for areas that may have been overlooked in the session,
- providing contact information for the interviewees to follow up with additional information after the meeting as needed,
- summarizing the session,
- outlining the process for how the interview results will be used, and
- thanking the interviewees for their time.

.6 Interview Follow-Up

It is important for the interviewer to organize the information and confirm results with the interviewees as soon as possible after the interview. Sharing the information that has been learned allows the interviewees to point out any missed or incorrectly recorded items.

10.25.4 Usage Considerations

.1 Strengths

- Encourages participation by and establishes rapport with stakeholders.
- Simple, direct technique that can be used in a variety of situations.
- Allows the interviewer and participant to have full discussions and explanations of the questions and answers.
- Enables observations of non-verbal behaviour.
- The interviewer can ask follow-up and probing questions to confirm their own understanding.
- Maintains focus through the use of clear objectives for the interview that are agreed upon by all participants and can be met in the time allotted.
- Allows interviewees to express opinions in private that they may be reluctant to express in public, especially when interview results are kept confidential.

.2 Limitations

- Significant time is required to plan for and conduct interviews.
- Requires considerable commitment and involvement of the participants.
- Training is required to conduct effective interviews.
- Based on the level of clarity provided during the interview, the resulting documentation may be subject to the interviewer's interpretation.
- There is a risk of unintentionally leading the interviewee.

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10.26 Item Tracking

10.26.1 Purpose

Item tracking is used to capture and assign responsibility for issues and stakeholder concerns that pose an impact to the solution.

10.26.2 Description

Item tracking is an organized approach used by business analysts to address stakeholder concerns. Stakeholders may identify such item types as actions, assumptions, constraints, dependencies, defects, enhancements, and issues.

When a stakeholder concern is first raised, it is assessed to determine if it is viable. If viable, the concern is classified as a specific item type so that it can be better tracked and controlled by a process that works towards the item's closure. During its life cycle, an item is assigned to one or more stakeholders who are responsible for its resolution.

Item tracking tracks the item from the initial recording of the concern and its degree of impact to its agreed-upon closure. The item tracking record may be shared with stakeholders to ensure transparency and visibility into the status and progress of items in the record.

10.26.3 Elements

.1 Item Record

Each recorded item may contain all or any of the following attributes for item tracking. These items may be recorded using various software applications or manually catalogued for sharing between an agreed set of stakeholders.

- **Item Identifier**: a unique identifier that distinguishes one item from another.
- **Summary**: a brief description of the item.
- **Category**: a grouping of items with similar properties.
- **Type**: the kind of item raised.
- **Date Identified**: the date the item was raised as a concern.
- **Identified By**: the person who initially raised the concern.
- **Impact**: the possible consequences if the item is not resolved by the resolution due date. Impact can be assessed in relation to the initiative's time, cost, scope, or quality.
- **Priority**: the importance of this item to the impacted stakeholders.
- **Resolution Date**: the date by which the item must be resolved (or closed).
- **Owner**: the stakeholder assigned to manage the item to its closure.

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- **Resolver**: the stakeholder assigned to resolve the item.
- **Agreed Strategy**: agreed-upon strategy for the item. Examples include accept, pursue, ignore, mitigate, and avoid.
- **Status**: the current status of the item within its life cycle. Examples include open, assigned, resolved, and cancelled.
- **Resolution Updates**: a running log of details about how the item's resolution is proceeding towards closure, as well as approval of its completion.
- **Escalation Matrix**: a level of escalation in case the item is not resolved by the given due date.

.2 Item Management

Each item's resolution is undertaken as prescribed by stakeholder needs and according to any organizational process standards. In some cases, one item may cause another item to be recorded and tracked. In these situations, close attention is needed so that item resolution efforts are not duplicated and are progressing in coordination. Each item must be tracked to its closure or resolution.

.3 Metrics

All stakeholders benefit from the detailed information that is maintained about any item and its progress. These items can be looked at individually for resolution or even used to define key performance indicators tailored to the item tracking process.

By reviewing this output, stakeholders can determine how well:

- items are being resolved by the proper resources,
- the initiative is progressing, and
- the item tracking process is being utilized.

10.26.4 Usage Considerations

.1 Strengths

- Ensures concerns around stakeholder requirements are captured, tracked, and resolved to the stakeholder's satisfaction.
- Allows stakeholders to rank the importance of outstanding items.

.2 Limitations

- If not careful, the copious recording of data about items may outweigh any benefits realized.
- It may use time that could be better spent on other efforts and stakeholders could become mired in details and statistics.

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10.27 Lessons Learned

10.27.1 Purpose

The purpose of the lessons learned process is to compile and document successes, opportunities for improvement, failures, and recommendations for improving the performance of future projects or project phases.

10.27.2 Description

A lessons learned session (also known as a retrospective) helps identify either changes to business analysis processes and deliverables or successes that can be incorporated into future work. These techniques can also be beneficial at the close of any milestone within the effort.

Lessons learned sessions can include any format or venue that is acceptable to the key stakeholders and can be either formal facilitated meetings with set agendas and meeting roles or informal working sessions. If there are noteworthy successes, a celebration may be included in a lessons learned session.

10.27.3 Elements

Sessions can include a review of:

- business analysis activities or deliverables,
- the final solution, service, or product,
- automation or technology that was introduced or eliminated,
- impact to organizational processes,
- performance expectations and results,
- positive or negative variances,
- root causes impacting performance results, and
- recommendations for behavioural approaches.

10.27.4 Usage Considerations

.1 Strengths

- Useful in identifying opportunities or areas of improvement.
- Assists in building team morale after a difficult period.
- Reinforces positive experiences and successes.
- Reduces risks for future actions.
- Provides tangible value or metrics as a result of the effort.
- Recognizes strengths or shortcomings with the project structure, methodology, or tools that were used.

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.2 Limitations

- Honest discussion may not occur if participants try to assign blame during these sessions.
- Participants may be reluctant to document and discuss problems.
- Proactive facilitation may be required to ensure that the discussions remain focused on solutions and improvement opportunities.

10.28 Metrics and Key Performance Indicators (KPIs)

10.28.1 Purpose

Metrics and key performance indicators measure the performance of solutions, solution components, and other matters of interest to stakeholders.

10.28.2 Description

A metric is a quantifiable level of an indicator that an organization uses to measure progress. An indicator identifies a specific numerical measurement that represents the degree of progress toward achieving a goal, objective, output, activity, or further input. A key performance indicator (KPI) is one that measures progress towards a strategic goal or objective. Reporting is the process of informing stakeholders of metrics or indicators in specified formats and at specified intervals.

Metrics and reporting are key components of monitoring and evaluation. Monitoring is a continuous process of data collection used to determine how well a solution has been implemented as compared to the expected results. Evaluation is the systematic and objective assessment of a solution both to determine its status and effectiveness in meeting objectives over time and to identify ways to improve the solution to better meet objectives. The top priorities of a monitoring and evaluation system are the intended goals and effects of a solution, as well as inputs, activities, and outputs.

10.28.3 Elements

.1 Indicators

An indicator displays the result of analyzing one or more specific measures for addressing a concern about a need, value, output, activity, or input in a table or graphical form. Each concern requires at least one indicator to measure it properly, but some may require several.

A good indicator has six characteristics:

- **Clear**: precise and unambiguous.
- **Relevant**: appropriate to the concern.

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- **Economical**: available at reasonable cost.
- **Adequate**: provides a sufficient basis on which to assess performance.
- **Quantifiable**: can be independently validated.
- **Trustworthy and Credible**: based on evidence and research.

In addition to these characteristics, stakeholder interests are also important. Certain indicators may help stakeholders perform or improve more than others. Over time, weaknesses in some indicators can be identified and improved.

Not all factors can be measured directly. Proxies can be used when data for direct indicators are not available or when it is not feasible to collect at regular intervals. For example, in the absence of a survey of client satisfaction, an organization might use the proportion of all contracts renewed as an indicator.

When establishing an indicator, business analysts will consider its source, method of collection, collector, and the cost, frequency, and difficulty of collection. Secondary sources of data may be the most economical, but to meet the other characteristics of a good indicator, primary research such as surveys, interviews, or direct observations may be necessary. The method of data collection is the key driver of a monitoring, evaluation, and reporting system's cost.

.2 Metrics

Metrics are quantifiable levels of indicators that are measured at a specified point in time. A target metric is the objective to be reached within a specified period. In setting a metric for an indicator, it is important to have a clear understanding of the baseline starting point, resources that can be devoted to improving the factors covered by the indicator, and political concerns.

A metric can be a specific point, a threshold, or a range. A range can be useful if the indicator is new. Depending on the need, the scope of time to reach the target metric can be multi-year, annual, quarterly, or even more frequent.

.3 Structure

Establishing a monitoring and evaluation system requires a data collection procedure, a data analysis procedure, a reporting procedure, and the collection of baseline data. The data collection procedure covers units of analysis, sampling procedures, data collection instruments to use, collection frequency, and responsibility for collection. The analysis method specifies both the procedures for conducting the analysis and the data consumer, who may have strong interests in how the analysis is conducted. The reporting procedure covers the report templates, recipients, frequency, and means of communication. Baseline information is the data provided immediately before or at the beginning of a period to measure. Baseline data is used both to learn about recent performance and to measure progress from that point forward. It needs to be collected, analyzed, and reported for each indicator.

There are three key factors in assessing the quality of indicators and their metrics: reliability, validity, and timeliness. Reliability is the extent to which the data collection approach is stable and consistent across time and space. Validity is the

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extent to which data clearly and directly measures the performance the organization intends to measure. Timeliness is the fit of the frequency and latency of data to the management's need.

.4 Reporting

Typically, reports compare the baseline, current metrics, and target metrics with calculations of the differences presented in both absolute and relative terms. In most situations, trends are more credible and important than absolute metrics. Visual presentations tend to be more effective than tables, particularly when using qualitative text to explain the data.

10.28.4 Usage Considerations

.1 Strengths

- Establishing a monitoring and evaluation system allows stakeholders to understand the extent to which a solution meets an objective, as well as how effective the inputs and activities of developing the solution (outputs) were.
- Indicators, metrics, and reporting also facilitate organizational alignment, linking goals to objectives, supporting solutions, underlying tasks, and resources.

.2 Limitations

- Gathering excessive amounts of data beyond what is needed will result in unnecessary expense in collecting, analyzing, and reporting. It will also distract project members from other responsibilities. On Agile projects, this will be particularly relevant.
- A bureaucratic metrics program fails from collecting too much data and not generating useful reports that will allow timely action. Those charged with collecting metric data must be given feedback to understand how their actions are affecting the quality of the project results.
- When metrics are used to assess performance, the individuals being measured are likely to act to increase their performance on those metrics, even if this causes sub-optimal performance on other activities.

10.29 Mind Mapping

10.29.1 Purpose

Mind mapping is used to articulate and capture thoughts, ideas, and information.

10.29.2 Description

Mind mapping is a form of note taking that captures thoughts, ideas, and information in a non-linear diagram. Mind maps use images, words, colour, and

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connected relationships to apply structure and logic to thoughts, ideas, and information. A mind map has a central main idea supported by secondary ideas (or topics), followed by as many layers of ideas (or sub-topics) as necessary to fully capture and articulate the concept. Connections are made between ideas by branches that typically have a single keyword associated with them that explain the connection.

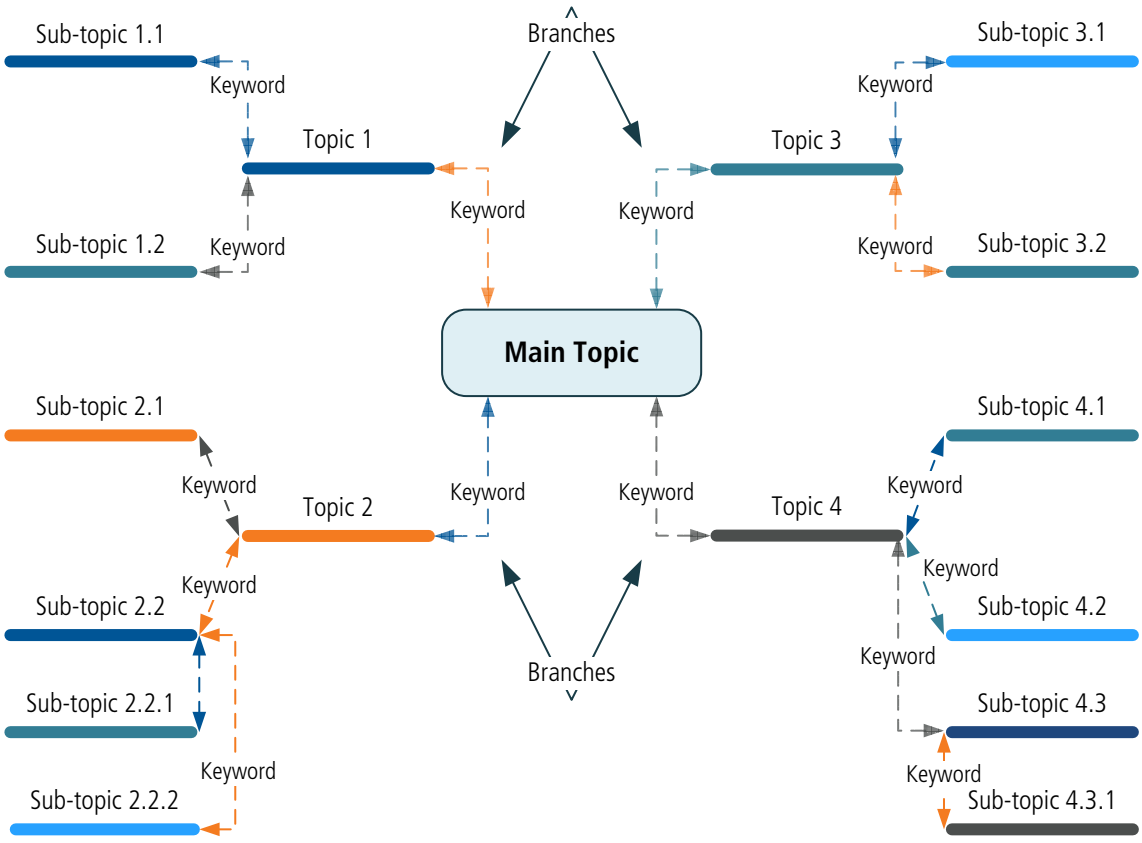
Mind maps can be developed individually or as a collaboration exercise. They can be created on paper or with the use of specialized software.

Business analysts use mind maps to:

- think through and generate ideas on complex concepts or problems,
- explore relationships between the various facets of a problem in a way that inspires creative and critical thinking, and
- present a consolidated view of complex concepts or problems.

There is no standardized format for a mind map. The intent of a mind map is to capture information in a fashion closely resembling how our minds process information. The following image is intended to illustrate the general structure and usage of mind maps.

Figure 10.29.1: The Taxonomy of a Mind Map



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10.29.3 Elements

.1 Main Topic

The main topic of a mind map is the thought or concept that is being articulated. The main topic is positioned in the centre of the images so that multiple topics and associations can branch off. Images are frequently used as the main topic because they contain a great deal of information and can be useful in stimulating associated topics.

.2 Topics

Topics are thoughts or concepts that expound upon or further articulate the main topic. Their association with the main topic is expressed through a branch (connected line) that has a keyword associated with it. There can be as many or as few topics as required to fully explore the thought or concept of the main topic.

.3 Sub-topics

Sub-topics are thoughts or concepts that expound upon or further articulate the topic and directly relate to the main topic. Their association with the topic is expressed through a branch (connected line) that has a keyword associated with it. There can be as many or as few sub-topics as required to fully explore the thought or concept of the main topic.

.4 Branches

Branches are the associations between the main topic, topics, and sub-topics. Branches include a keyword that clearly articulates the nature of the association.

.5 Keywords

Keywords are single words used to articulate the nature of the association of topics or sub-topics connected by a branch. The keywords are useful for both categorizing topics and for triggering additional associations.

.6 Colour

Colour may be used to categorize, prioritize, and analyze topics, sub-topics, and their associations. There is no defined colour coding standard for mind maps. Each mind map creator applies colour in a way that best suits their mode of thinking.

.7 Images

Images can be used in mind maps to express larger volumes of information that are unable to be expressed in short topic headings. Images are useful in stimulating creativity and innovation by generating additional thoughts, ideas, and associations.

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10.29.4 Usage Considerations

.1 Strengths

- Can be used as an effective collaboration and communication tool.
- Summarizes complex thoughts, ideas, and information in a way that shows the overall structure.
- Associations and sub-topics facilitate understanding and decision making.
- Enable creative problem solving by articulating associations and generating new associations.
- Can be helpful in preparing and delivering presentations.

.2 Limitations

- Can be misused as a brainstorming tool, and the related documenting of ideas and creating associations may inhibit idea generation.
- A shared understanding of a mind map can be difficult to communicate.

10.30 Non-Functional Requirements Analysis

10.30.1 Purpose

Non-functional requirements analysis examines the requirements for a solution that define how well the functional requirements must perform. It specifies criteria that can be used to judge the operation of a system rather than specific behaviours (which are referred to as the functional requirements).

10.30.2 Description

Non-functional requirements (also known as quality attributes or quality of service requirements) are often associated with system solutions, but they also apply more broadly to both process and people aspects of solutions. They augment the functional requirements of a solution, identify constraints on those requirements, or describe quality attributes a solution must exhibit when based on those functional requirements.

Non-functional requirements are generally expressed in textual formats as declarative statements or in matrices. Declarative non-functional requirements statements will typically have a constraining factor to them. For example, errors must not exceed X per use of the process, transactions must be at least X% processed after S seconds, or the system must be available X% of the time.

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10.30.3 Elements

.1 Categories of Non-Functional Requirements

Common categories of non-functional requirements include:

- **Availability**: degree to which the solution is operable and accessible when required for use, often expressed in terms of percent of time the solution is available.
- **Compatibility**: degree to which the solution operates effectively with other components in its environment, such as one process with another.
- **Functionality**: degree to which the solution functions meet user needs, including aspects of suitability, accuracy, and interoperability.
- **Maintainability**: ease with which a solution or component can be modified to correct faults, improve performance or other attributes, or adapt to a changed environment.
- **Performance Efficiency**: degree to which a solution or component performs its designated functions with minimum consumption of resources. Can be defined based on the context or period, such as high-peak, mid-peak or off-peak usage.
- **Portability**: ease with which a solution or component can be transferred from one environment to another.
- **Reliability**: ability of a solution or component to perform its required functions under stated conditions for a specified period of time, such as mean time to failure of a device.
- **Scalability**: degree with which a solution is able to grow or evolve to handle increased amounts of work.
- **Security**: aspects of a solution that protect solution content or solution components from accidental or malicious access, use, modification, destruction, or disclosure.
- **Usability**: ease with which a user can learn to use the solution.
- **Certification**: constraints on the solution that are necessary to meet certain standards or industry conventions.
- **Compliance**: regulatory, financial, or legal constraints which can vary based on the context or jurisdiction.
- **Localization**: requirements dealing with local languages, laws, currencies, cultures, spellings, and other characteristics of users, which requires attention to the context.
- **Service Level Agreements**: constraints of the organization being served by the solution that are formally agreed to by both the provider and the user of the solution.
- **Extensibility**: the ability of a solution to incorporate new functionality.

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.2 Measurement of Non-Functional Requirements

Non-functional requirements often describe quality characteristics in vague terms, such as "the process must be easy to learn", or "the system must respond quickly". To be useful to developers of a solution and to be verifiable, non-functional requirements must be quantified whenever possible. Including an appropriate measure of success provides the opportunity for verification.

For example:

- "The process must be easy to learn" can be expressed as "90% of operators must be able to use the new process after no more than six hours of training", and
- "The system must respond quickly" can be expressed as "The system must provide 90% of responses in no more than two seconds".

Measurement of the other categories of non-functional requirements is guided by the source of the requirement.

For example:

- certification requirements are generally specified in measurable detail by the organization setting the standard or convention, such as ISO Certification standards,
- compliance requirements and localization requirements are set in measurable detail by their providers,
- effective service level agreements state clearly the measures of success required, and
- an organization's enterprise architecture generally defines the solution environment requirements and specifies exactly which platform or other attribute of the environment is required.

.3 Context of Non-Functional Requirements

Depending on the category of non-functional requirements, the context may have to be considered. For example, a regulatory agency may impose context-impacting compliance and security requirements, or an organization that is expanding operations abroad may have to consider localization and scalability requirements. Determining the optimal portfolio of non-functional requirements in a given organizational context is central to delivering value to stakeholders.

The assessment of a non-functional requirement, such as localization or maintainability, may impose contextual pressures on other non-functional requirements. For instance, regulations or resources in one jurisdiction may affect the maintainability of a solution in that region, and so it may justify a lower performance efficiency or reliability measure of success than in another jurisdiction.

Context is dynamic by nature and non-functional requirements may need to be adjusted or removed outright. Business analysts consider the relative stability of the context when evaluating non-functional requirements.

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10.30.4 Usage Considerations

.1 Strengths

- Clearly states the constraints that apply to a set of functional requirements.
- Provides measurable expressions of how well the functional requirements must perform, leaving it to the functional requirements to express what the solution must do or how it must behave. This will also have a strong influence on whether the solution is accepted by the users.

.2 Limitations

- The clarity and usefulness of a non-functional requirement depends on what the stakeholders know about the needs for the solution and how well they can express those needs.
- Expectations of multiple users may be quite different, and getting agreement on quality attributes may be difficult because of the users' subjective perception of quality. For example, what might be 'too fast' to one user might be 'too slow' to another.
- A set of non-functional requirements may have inherent conflicts and require negotiation. For example, some security requirements may require compromises on performance requirements.
- Overly strict requirements or constraints can add more time and cost to the solution, which may have negative impacts and weaken adoption by users.
- Many non-functional requirements are qualitative and therefore may be difficult to be measured on a scale, and may garner a degree of subjectivity by the users as to how they believe the particular requirements ultimately meet their needs.

10.31 Observation

10.31.1 Purpose

Observation is used to elicit information by viewing and understanding activities and their context. It is used as a basis for identifying needs and opportunities, understanding a business process, setting performance standards, evaluating solution performance, or supporting training and development.

10.31.2 Description

Observation of activities, also known as job shadowing, involves examining a work activity firsthand as it is performed. It can be conducted in either natural work environments or specially constructed laboratory conditions. The objectives of the observation dictate how it is planned for and methodically conducted.

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There are two basic approaches for observation:

- **Active/Noticeable**: while observing an activity the observer asks any questions as they arise. Despite this interruption to the work flow, the observer can more quickly understand the rationale and hidden processes underlying the activity, such as decision making. A variation of this method may involve even stronger intervention into actors' activities by stimulating them to perform specific tasks. This kind of facilitated observation allows focus on the observer's objectives in order to shorten observation time or elicit specific information.
- **Passive/Unnoticeable**: during the activity the observer does not interrupt the work. Any concerns are raised once the observation is over. This allows observation of a natural flow of events without intervention by the observer, as well as measurement of the time and quality of work. A variation of this method is video recording the activity and then reviewing it with the person being observed so they may provide further clarification.

Inspection of a person's work environment helps in discovering any tools and information assets involved in performing their activities. This supports understanding of the activities, especially with the purpose of identifying needs and opportunities. This kind of observation is an important part of the technique's variation, and is known as Contextual Inquiry.

10.31.3 Elements

.1 Observation Objectives

A clear and specific objective establishes a defined purpose of the observation session.

Objectives of an observation session may include:

- understanding the activity and its elements such as tasks, tools, events, and interactions,
- identifying opportunities for improvement,
- establishing performance metrics, or
- assessing solutions and validating assumptions.

.2 Prepare for Observation

Preparing for an observation session involves planning the observation approach based on the objectives and deciding who should be viewed performing which activities at what times. While preparing for an observation session, business analysts consider the skill and experience levels of participants, the frequency of the activities being observed, and any existing documentation and analysis related to the work activity. Preparing for observation also includes creating a schedule of observations.

The plan for observation ensures that all stakeholders are aware of the purpose of the observation session, they agree on the expected outcomes, and that the session meets their expectations.

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.3 Conduct the Observation Session

Before the observation session:

- explain why the observation is being conducted,
- reassure the participant that their personal performance is not being judged and that the results of this observation, among others, will be evaluated as a whole,
- inform the participant that they can stop the observation at any time, and
- recommend the sharing of any reasoning or concerns while performing the activity or soon afterwards.

During the observation session:

- attentively watch the person perform the activity and note typical and atypical tasks or steps, the manner in which any tools are used, and information content,
- record what is seen, the time taken to perform the work, its quality, any process anomalies, and the observer's own concerns or questions, and
- ask probing questions either while the work is being performed or soon after the observation session.

.4 Confirm and Present Observation Results

After the observation session, business analysts review the notes and data recorded from the observation and follow up with the participant to obtain answers to any remaining questions or to fill any gaps. Sharing these notes and data with participants may be helpful in obtaining answers to any questions or easing any concerns the participant may have.

The validated notes and data are collated with other related observations to identify similarities, differences, and trends. Findings are aggregated, summarized, and analyzed against the objectives of the session. Needs and opportunities for improvement are communicated to stakeholders.

10.31.4 Usage Considerations

.1 Strengths

- Observers can gain realistic and practical insight about the activities and their tasks within an overall process.
- Instances of informally performed tasks as well as any workarounds can be identified.
- Productivity can be viewed firsthand and realistically compared against any established performance standards or metrics.
- Recommendations for improvement are supported by objective and quantitative evidence.

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.2 Limitations

- May be disruptive to the performance of the participant and the overall organization.
- Can be threatening and intrusive to the person being observed.
- While being observed, a participant may alter their work practices.
- Significant time is required to plan for and conduct observations.
- Not suitable for evaluating knowledge-based activities since these are not directly observable.

10.32 Organizational Modelling

10.32.1 Purpose

Organizational modelling is used to describe the roles, responsibilities, and reporting structures that exist within an organization and to align those structures with the organization's goals.

10.32.2 Description

An organizational model defines how an organization or organizational unit is structured. The purpose of an organizational unit is to bring together a group of people to fulfill a common purpose. The group may be organized because the people share a common set of skills and knowledge or to serve a particular market.

An organizational model is a visual representation of the organizational unit which defines:

- the boundaries of the group (who is in the group),
- the formal relationships between members (who reports to whom),
- the functional role for each person, and
- the interfaces (interaction and dependencies) between the unit and other units or stakeholders.

10.32.3 Elements

.1 Types of Organizational Models

There are three pre-eminent organizational models:

- **Functionally-oriented**: group staff together based on shared skills or areas of expertise and generally encourage a standardization of work or processes within the organization. Functional organizations are beneficial because they seem to facilitate cost management and reduce duplication of work, but are prone to develop communication and cross-functional

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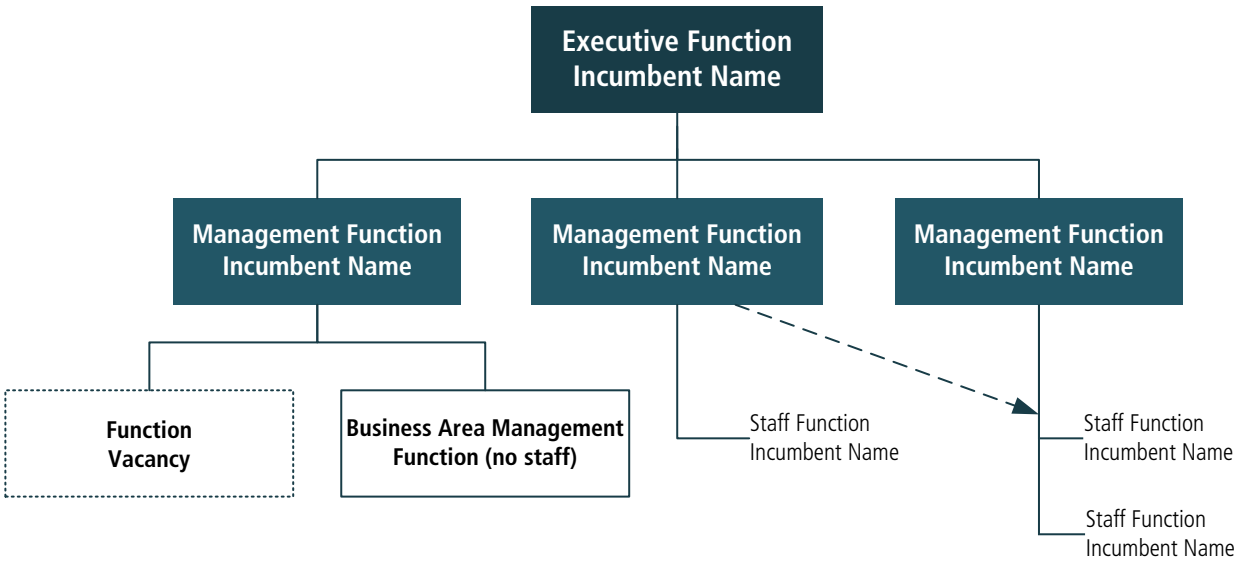
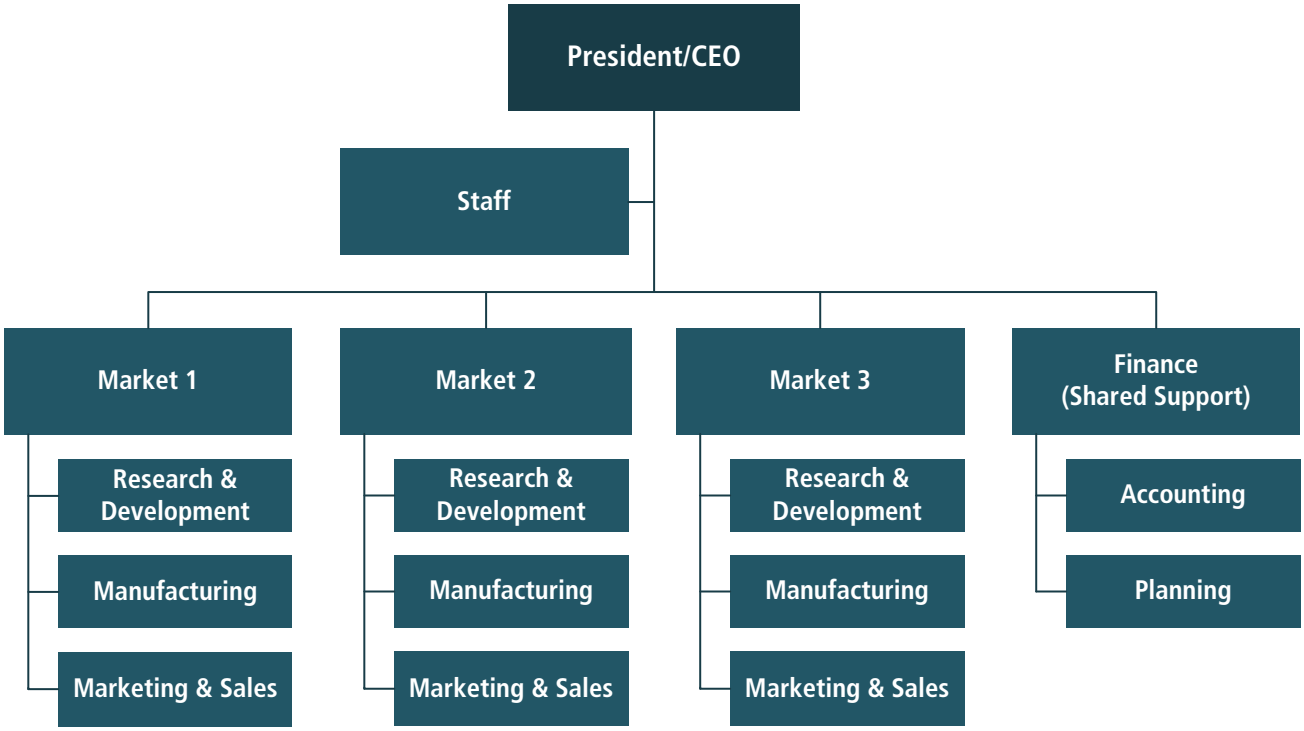
coordination problems (known informally as "silos").

Figure 10.32.1: Functionally-oriented Organizational Model



- **Market-oriented**: may be intended to serve particular customer groups, geographical areas, projects, or processes rather than grouping employees by common skills or expertise. Market-oriented structures permit the organization to meet the needs of its customers, but are prone to developing inconsistencies in how work is performed. Some may discover they are performing duplicate work in multiple areas.

Figure 10.32.2: Market-oriented Organizational Model



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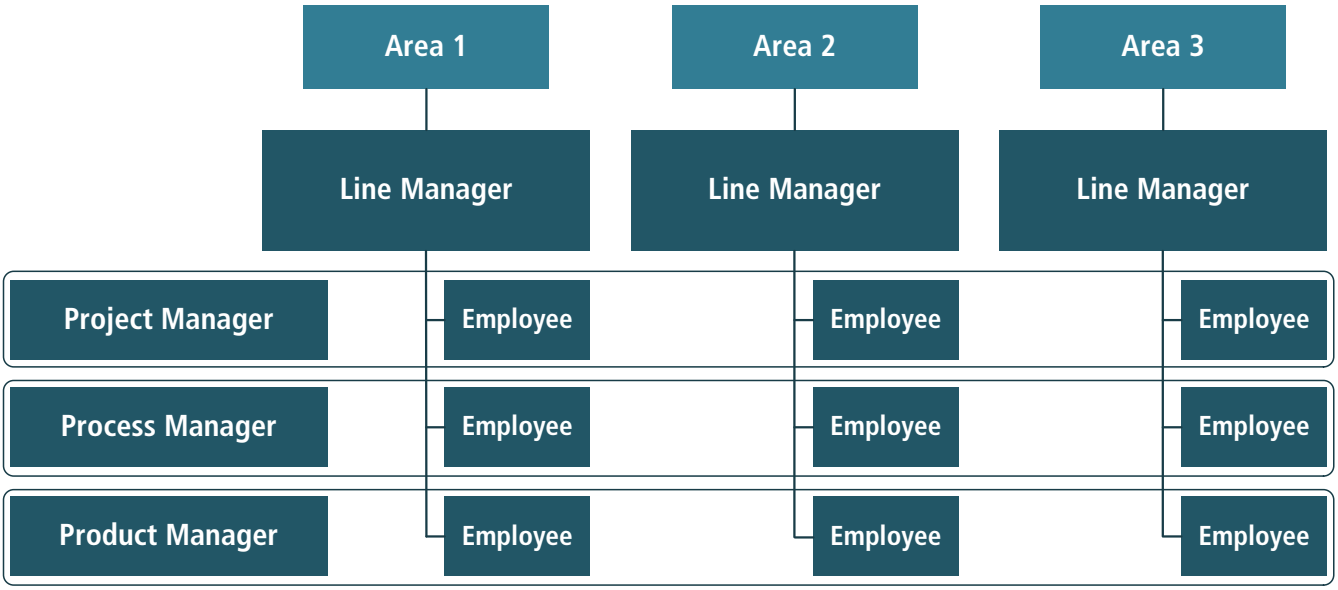
- **The Matrix Model**: has separate managers for each functional area and for each product, service, or customer group. Employees report to a line manager, who is responsible for the performance of a type of work and for identifying opportunities for efficiency in the work, and to a market (or product, service, or project) manager, who is responsible for managing the product or service across multiple functional areas. A challenge of the matrix model is that each employee has two managers (who are focused on different goals) and accountability is difficult to maintain.

Figure 10.32.3: Matrix Organizational Model



.2 Roles

An organizational unit includes a number of defined roles. Each role requires a certain set of skills and knowledge, has specific responsibilities, performs certain kinds of work, and has defined relationships with other roles in the organization.

.3 Interfaces

Each organizational unit has interfaces with other organizational units. Interfaces (interactions) may be in the form of communication with people in other roles and work packages that the organizational unit receives from or delivers to other units.

.4 Organizational Charts

The fundamental diagram used in organizational modelling is the organizational chart (org chart).

There is no recognized standard for org charts, although there are some conventions that most org charts follow:

- A box depicts:
  - **Organizational Unit**: people, teams, departments, or divisions. An org

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chart may mix organizational units and show a mix of people, teams, and higher-level divisions.

- **Roles and People**: the roles within an organization and the people assigned to each role.

- A line depicts:
  - **Lines of Reporting**: accountability and control between units. A solid line typically denotes direct authority, while a dotted line indicates information transfer or situational authority. Lines of reporting depict the relationship between a manager and an organizational unit

.5 Influencers

Organizational charts are the primary tool for beginning organizational modelling. Organizational charts represent the formal structure of the organization. Business analysts also identify informal lines of authority, influence, and communication which may not directly align with the formal organizational chart.

Determining all of the influencers is important in planning communication and making provisions for user acceptance. One method of identifying influencers may be to ask stakeholders, "Who can I ask…" and note the answers. An influencer may be a person everyone goes to for information, direction, and advice. Another method is to note who speaks for the group in meetings.

10.32.4 Usage Considerations

.1 Strengths

- Organizational models are common in most organizations.
- Including an organizational model in business analysis information allows team members to provide support. Future projects may benefit from knowing who was involved in this project and what their role entailed.

.2 Limitations

- Organizational models are sometimes out of date.
- Informal lines of authority, influence, and communication not reflected in the org chart are more difficult to identify and may conflict with the organizational chart.

10.33 Prioritization

10.33.1 Purpose

Prioritization provides a framework for business analysts to facilitate stakeholder decisions and to understand the relative importance of business analysis information.

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10.33.2 Description

Prioritization is a process used to determine the relative importance of business analysis information. The importance may be based on value, risk, difficulty of implementation, or other criteria. These priorities are used to determine which business analysis information should be targeted for further analysis, which requirements should be implemented first, or how much time or detail should be allocated to the requirements.

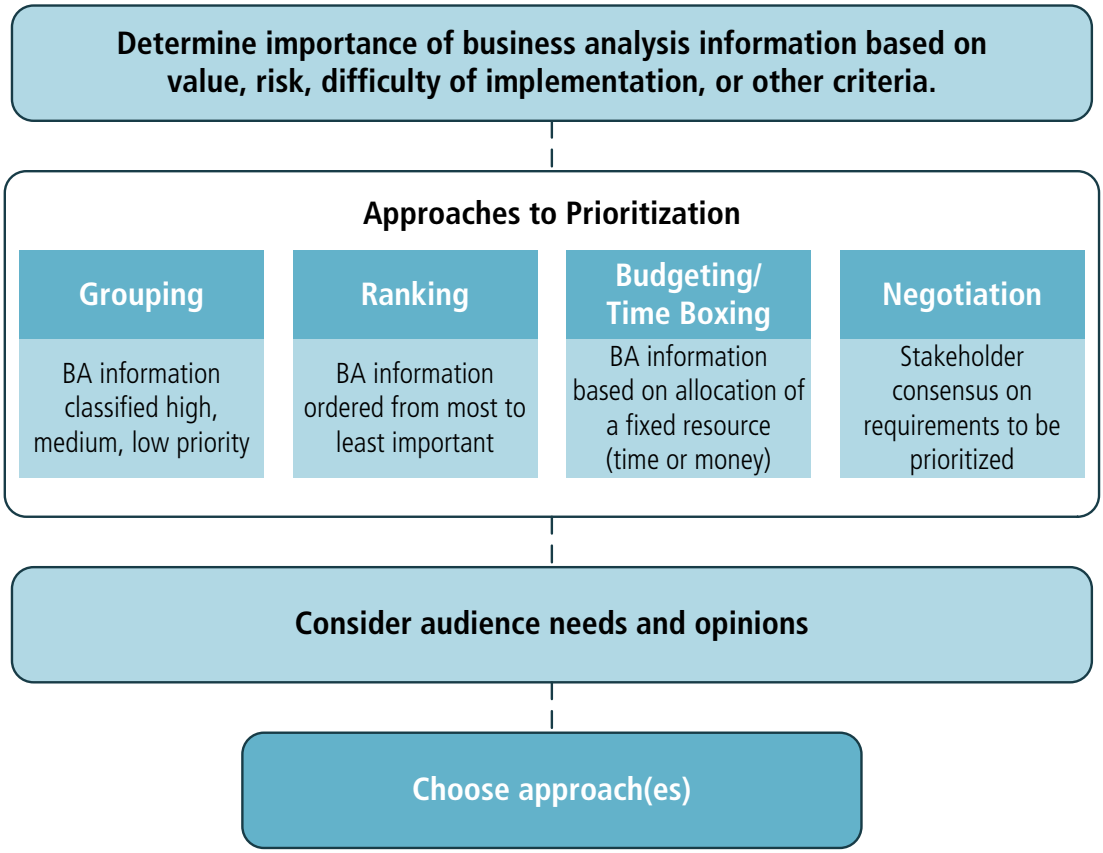
There are many approaches to prioritization. For the purpose of this technique, prioritization is classified into one of four approaches:

- Grouping,
- Ranking,
- Time boxing/Budgeting, and
- Negotiation.

When choosing a prioritization approach, business analysts consider the audience, their needs, and their opinions on the value a requirement or business analysis information brings to a stakeholder's respective area.

Business analysts revisit priorities and utilize different approaches when changes occur in the business environment, to the stakeholders, and to the business analysis information.

Figure 10.33.1: Approaches to Prioritization



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10.33.3 Elements

.1 Grouping

Grouping consists of classifying business analysis information according to predefined categories such as high, medium, or low priority. Many requirements management tools support listing the priority category as an attribute of a requirement.

.2 Ranking

Ranking consists of ordering business analysis information from most to least important. Some adaptive approaches involve the explicit sequencing of requirements in an ordered list (a product backlog).

.3 Time Boxing/Budgeting

Time boxing or budgeting prioritizes business analysis information based on the allocation of a fixed resource. It is frequently used when the solution approach has been determined. Time boxing is used to prioritize requirements based on the amount of work that the project team is capable of delivering in a set period of time. Budgeting is used when the project team has been allocated a fixed amount of money. This approach is most often used when a fixed deadline must be met or for solutions that are enhanced on a regular and frequent basis.

.4 Negotiation

The negotiation approach involves establishing a consensus among stakeholders as to which requirements will be prioritized.

10.33.4 Usage Considerations

.1 Strengths

- Facilitates consensus building and trade-offs and ensures that solution value is realized and initiative timelines are met.

.2 Limitations

- Some stakeholders may attempt to avoid difficult choices and fail to recognize the necessity for making trade-offs.
- The solution team may intentionally or unintentionally try to influence the result of the prioritization process by overestimating the difficulty or complexity of implementing certain requirements.
- Metrics and key performance indicators are often not available when prioritizing business analysis information; therefore, a stakeholder's perspective of the importance may be subjective.

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10.34 Process Analysis

10.34.1 Purpose

Process analysis assesses a process for its efficiency and effectiveness, as well as its ability to identify opportunities for change.

10.34.2 Description

Process analysis is used for various purposes including:

- recommending a more efficient or effective process,
- determining the gaps between the current and future state of a process,
- understanding factors to be included in a contract negotiation,
- understanding how data and technology are used in a process, and
- analyzing the impact of a pending change to a process.

A number of frameworks and methodologies exist that focus on process analysis and improvement methods, such as Six Sigma and Lean. Methods for process improvement include value stream mapping, statistical analysis and control, process simulation, benchmarking, and process frameworks.

Common changes made to processes in order to improve them include:

- reducing the time required to complete a task or tasks in the process,
- modifying interfaces or hand-offs between roles and organizational units to remove errors, including the reduction or elimination of bottlenecks,
- automating steps that are more routine or predictable, and
- increasing the degree of automation in the decision making required by the process.

When analyzing a process, business analysts look for:

- how the process adds or creates value for the organization,
- how the process aligns to organizational goals and strategy,
- to what degree the process is and needs to be efficient, effective, repeated, measured, controlled, used, and transparent, and
- how the requirements for a solution cover the future state process and its external stakeholders, including customers.

10.34.3 Elements

.1 Identify Gaps and Areas to Improve

Identifying gaps and areas to improve helps to identify what areas are in scope for analysis. Industry-specific models and process frameworks may be helpful in this

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regard. When identifying gaps and areas to improve, business analysts:

- identify gaps between the current and desired future state,
- identify what gaps and areas are value and non-value added,
- understand pain points and the challenges of the process from multiple points of view,
- understand opportunities to improve the process from multiple points of view,
- align the gaps and areas to improve with the strategic direction of the organization, and
- understand the relationship of the gaps and areas to improve to changes in the enterprise.

.2 Identify Root Cause

Identifying the root cause of the gaps and improvement areas ensures that the solution addresses the right gap and area.

When identifying the root cause, business analysts understand:

- there may be multiple root causes,
- the inputs leading to the gap or area of improvement,
- who the right people are to identify the root cause, and
- the current measurements and motivators in place for those owning or performing the process.

.3 Generate and Evaluate Options

Generating options and alternative solutions to solve for the gap or area of improvement helps the team evaluate and see different points of view for improving the process. It is important for stakeholders to be involved in identifying the impact, feasibility, and value of the proposed solution relative to alternative options.

.4 Common Methods

SIPOC

SIPOC is a process analysis method that originates in the Six Sigma methodology and has been more commonly adopted as a process analysis method outside of Six Sigma.

It is used to look at the process and understand the Suppliers, Inputs, Process, Outputs and Customers of the process being analyzed.

A SIPOC provides a simple overview of the process. It also shows the complexity of who and what is involved in creating inputs to the process and shows who receives outputs from the process. A SIPOC is a powerful tool used to create

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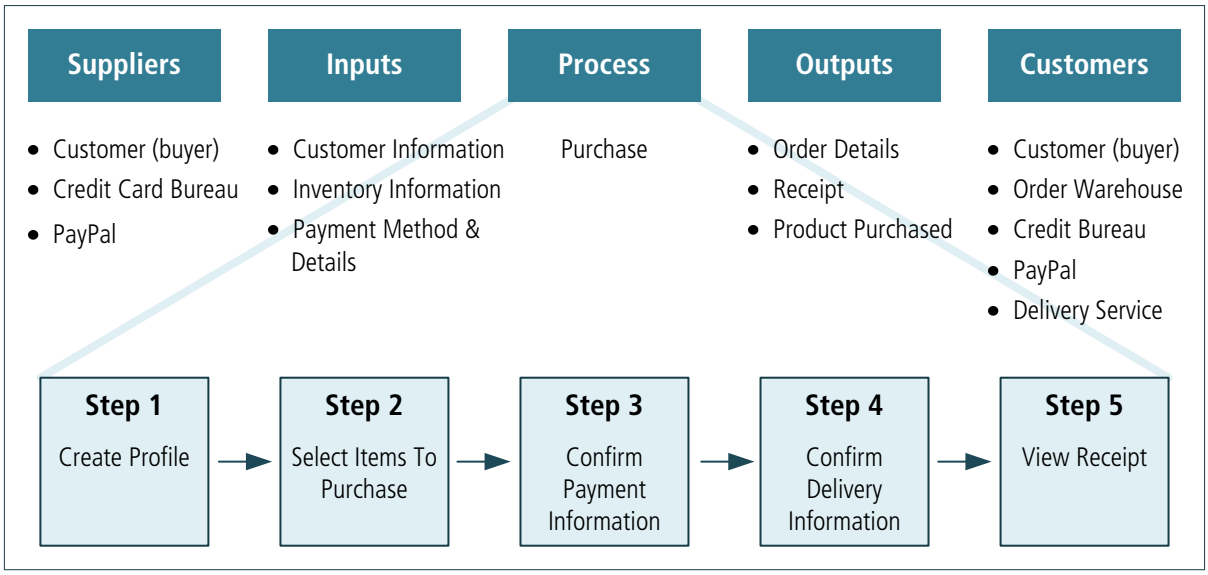
dialogue about problems, opportunities, gaps, root cause, and options and alternatives during process analysis.

Figure 10.34.1: SIPOC Model



Value Stream Mapping (VSM)

Value stream mapping (VSM) is a process analysis method used in Lean methodologies.

Value stream mapping involves the diagramming and monitoring of inputs and application points for processing those inputs, starting from the front-end of the supply chain. At each stage, the value stream map gauges the wait time for the inputs and the actual processing times at the application points (also known as conversion times). At the end of the supply chain, the value stream map depicts the logistics or distribution process to the customer.

The value stream map provides a one-page picture of all the steps involved in the end-to-end process, including both value-adding (the value stream) and non-value-adding (waste) elements.

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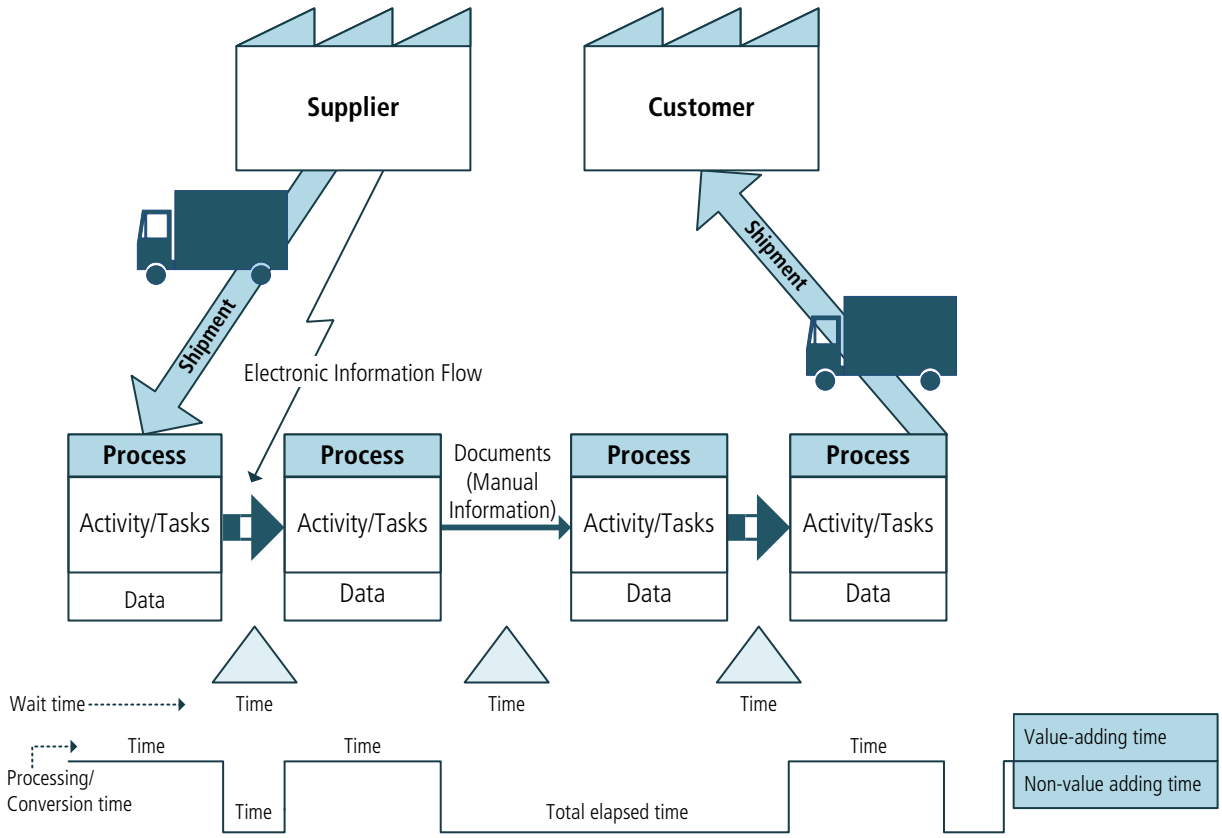
Figure 10.34.2: Value Stream Map



10.34.4 Usage Considerations

.1 Strengths

- Ensures solutions address the right issues, minimizing waste.
- Many different techniques and methodologies can be used and provide teams with great flexibility in approach.

.2 Limitations

- Can be time-consuming.
- There are many techniques and methodologies in process analysis. It can be challenging to decipher which to use and how rigorously to follow them, given the scope and purpose.
- May prove ineffective at process improvement in knowledge or decision-intensive processes.

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10.35 Process Modelling

10.35.1 Purpose

Process modelling is a standardized graphical model used to show how work is carried out and is a foundation for process analysis.

10.35.2 Description

Process models describe the sequential flow of work or activities. A business process model describes the sequential flow of work across defined tasks and activities through an enterprise or part of an enterprise. A system process model defines the sequential flow of control among programs or units within a computer system. A program process flow shows the sequential execution of program statements within a software program. A process model can also be used in documenting operational procedures.

A process model can be constructed on multiple levels, each of which can be aligned to different stakeholder points of view. These levels exist to progressively decompose a complex process into component processes, with each level providing increasing detail and precision. At a high (enterprise or context) level, the model provides a general understanding of a process and its relationship to other processes. At lower (operational) levels, it can define more granular activities and identify all outcomes, including exceptions and alternative paths. At the lowest (system) level, the model can be used as a basis for simulation or execution.

Process models can be used to:

- describe the context of the solution or part of the solution,
- describe what actually happens, or is desired to happen, during a process,
- provide an understandable description of a sequence of activities to an external observer,
- provide a visual to accompany a text description, and
- provide a basis for process analysis.

The business analyst can use a process model to define the current state of a process (also known as an as-is model) or a potential future state (also known as a to-be model). A model of the current state can provide understanding and agreement as to what happens now. A model of the future state can provide alignment with what is desired to happen in the future.

Process models generally include:

- the participants in the process,
- the business event that triggers the process,
- the steps or activities of the process (both manual and automated),
- the paths (flows) and decision points that logically link those activities, and

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- the results of the process.

The most basic process model includes: a trigger event, a sequence of activities, and a result.

A more comprehensive process model can include other elements, such as data/materials, inputs and outputs, and call-out descriptions that supplement the graphical representation.

10.35.3 Elements

.1 Types of Process Models and Notations

Many different notations are used in process modelling.

The most commonly used notations include the following:

- **Flowcharts and Value Stream Mapping (VSM)**: used in the business domain.
- **Data Flow diagrams and Unified Modelling Language™ (UML®) diagrams**: used in the information technology domain.
- **Business Process Model and Notation (BPMN)**: used across both business and information technology domains; is increasingly adopted as an industry standard.
- **Integrated DEFinition (IDEF) notation and Input, Guide, Output, Enabler (IGOE) diagrams**: used for establishing scope.
- **SIPOC and Value Stream Analysis**: used for process modelling.

Process models typically contain some or all of the following key elements:

- **Activity**: an individual step or piece of work that forms part of the business process. It may be a single task or may be further decomposed into a sub-process (with its own activities, flow, and other process elements).
- **Event**: a zero-time occurrence which initiates, interrupts, or terminates an activity or task within a process or the process itself. It may be a message received, the passage of time, or the occurrence of a condition as defined in the business rules.
- **Directional Flow**: a path that indicates the logical sequence of the workflow. In general, diagrams are drawn to show the passage of time in a consistent fashion (typically in the direction that text would be read).
- **Decision Point**: a point in the process where the flow of work splits into two or more flows (paths), which may be mutually exclusive alternatives or parallels. A decision can also be used to locate rules where separate flows merge together.
- **Link**: a connection to other process maps.
- **Role**: a type of person or group involved in the process. Its definitions typically match those in the organizational model.

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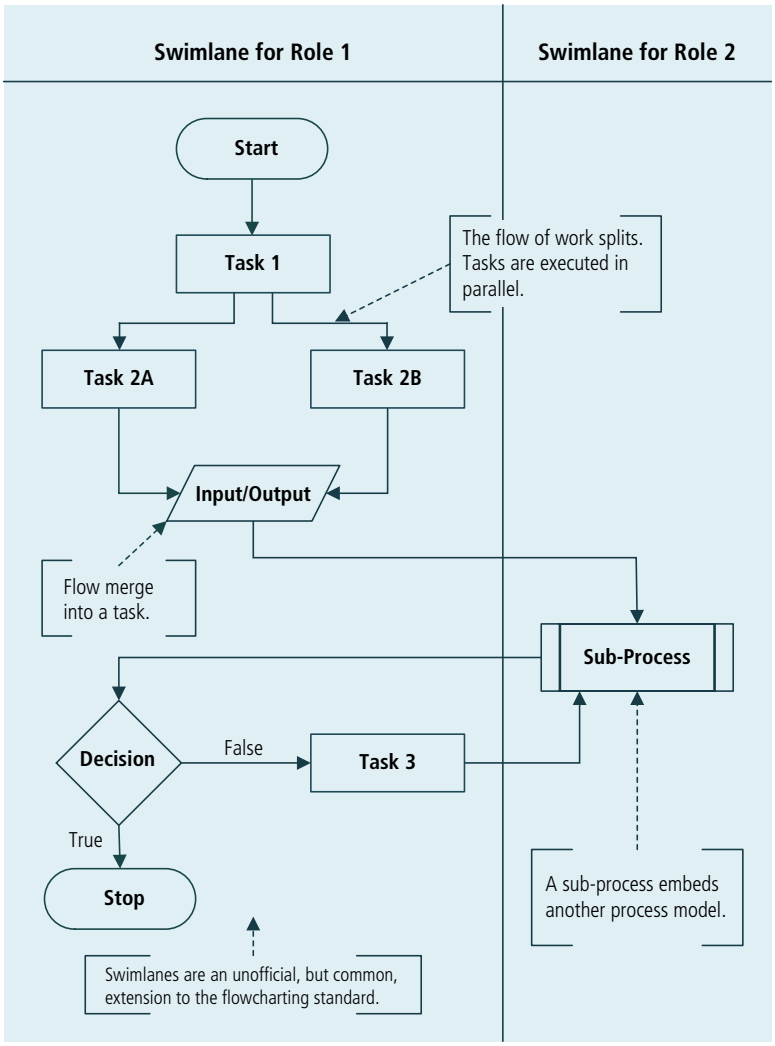
Flowchart

Flowcharts are used commonly with non-technical audiences and are good for gaining both alignment with what the process is and context for a solution. A flowchart can be simple, displaying just the sequence of activities, or it can be more comprehensive, using swimlanes. A swimlane is a partitioned area (horizontal or vertical) that segregates those activities in the process that are carried out by a particular role.

Figure 10.35.1: Flowchart



Business Process Model and Notation (BPMN)

Business Process Model and Notation (BPMN) provides an industry-standard language for modelling business processes in a form that is accessible by both business users and technical developers. BPMN is designed to cover many types of modelling, including both internal (private) processes and collaborative (public) processes. It can be the input to process automation technologies.

A key feature of BPMN is its ability to distinguish the activities of different participants in a process with pools and swimlanes. When the flow of work crosses the boundary of a swimlane, responsibility for the work then passes to

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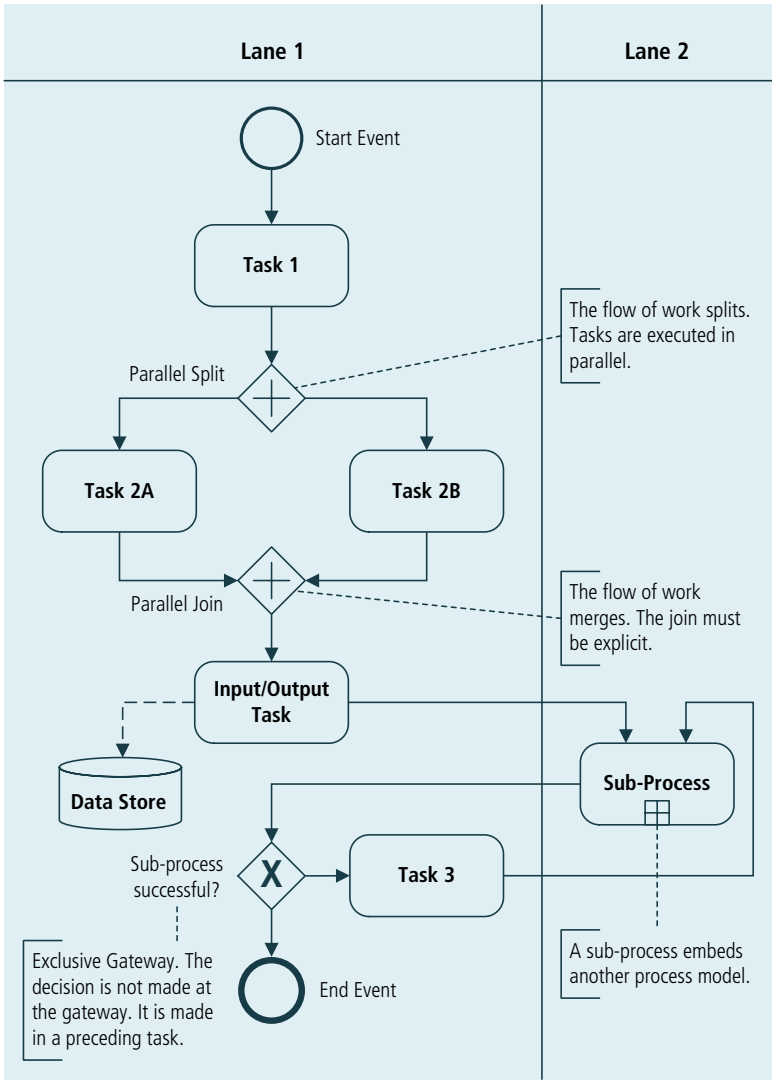
another role within the organization. Swimlanes are part of a pool. A pool is a self-regulating (free-standing) business entity, typically an organization or a system. A pool may include a number of swimlanes, each of which represents a role. Commonly, a process includes one pool for the customer and a second pool for the organization under study, although it is possible for a process to include any number of pools.

Figure 10.35.2: Business Process Model and Notation



Activity Diagram

The activity diagram is one of the use case realization diagrams defined in the Unified Modelling Language™ (UML®). Originally designed to elaborate on a single use case, the activity diagram has been adopted for more general process modelling purposes, including business process modelling. While similar in appearance to a flowchart, the activity diagram typically employs swimlanes to show responsibilities, synchronization bars to show parallel processing, and multiple exit decision points.

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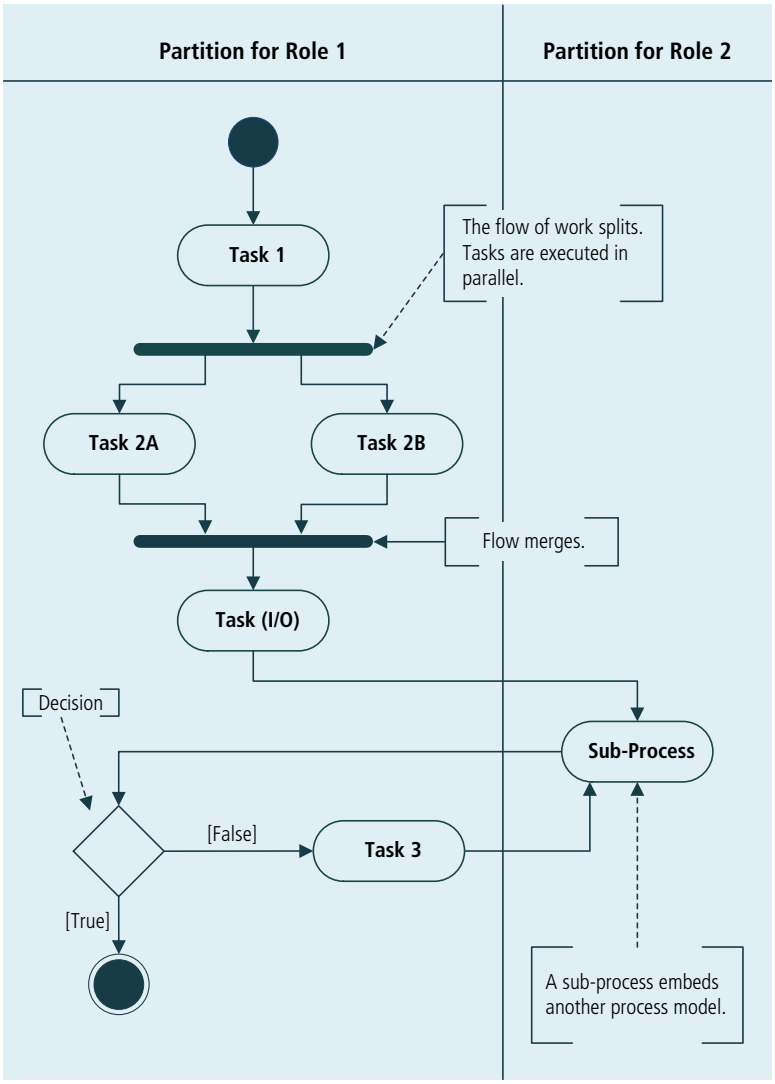
Figure 10.35.3: Activity Diagram



10.35.4 Usage Considerations

.1 Strengths

- Appeals to the basic human understanding of sequential activities.
- Most stakeholders are comfortable with the concepts and basic elements of a process model.
- The use of levels can accommodate the different perspectives of various stakeholder groups.
- Effective at showing how to handle a large number of scenarios and parallel branches.
- Can help identify any stakeholder groups that may have otherwise been overlooked.
- Facilitates the identification of potential improvements by highlighting "pain points" in the process structure (i.e. process visualization).

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- Likely to have value in its own right. They provide documentation for compliance purposes and can be used by business stakeholders for training and coordination of activities.
- Can be used as a baseline for continuous improvement.
- Ensures labelling consistency across artifacts.
- Provides transparency and clarity to process owners and participants on activity responsibilities, sequence and hand-overs.

.2 Limitations

- To many people in IT, a formal process model tends to reflect an older and more document-heavy approach to software development. Therefore, project time is not allocated to developing a process model, especially of the current state or problem domain.
- Can become extremely complex and unwieldy if not structured carefully. This is especially true if business rules and decisions are not managed separately from the process.
- Complex processes can involve many activities and roles; this can make them almost impossible for a single individual to understand and 'sign off'.
- Problems in a process cannot always be identified by looking at a high-level model. A more detailed model with reference to metadata (such as path frequency, cost, and time factors) is usually required. It is often necessary to engage with stakeholders directly to find the operational problems they have encountered while working with a process.
- In a highly dynamic environment where things change quickly, process models can become obsolete.
- May prove difficult to maintain if the process model only serves as documentation, as stakeholders may alter the process to meet their needs without updating the model.

10.36 Prototyping

10.36.1 Purpose

Prototyping is used to elicit and validate stakeholder needs through an iterative process that creates a model or design of requirements. It is also used to optimize user experience, to evaluate design options, and as a basis for development of the final business solution.

10.36.2 Description

Prototyping is a proven method for product design. It works by providing an early model of the final result, known as a prototype. Prototyping is used to identify both missing or improperly specified requirements and unsubstantiated

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assumptions by demonstrating what the product looks like and how it acts in the early stages of design.

Prototypes can be non-working models, working representations, or digital depictions of a solution or a proposed product. They can be used to mock up websites, serve as a partially working construct of the product, or describe processes through a series of diagrams (such as workflow). Business rules and data prototypes can be used to discover desired process flow and business rules. Data prototyping can be used for data cleansing and transformation.

10.36.3 Elements

.1 Prototyping Approach

There are two common approaches to prototyping:

- **Throw-away**: prototypes are generated with simple tools (such as paper and pencil, a whiteboard, or software) to serve the goal of uncovering and clarifying requirements. The prototype may be updated or evolve during the course of discussion and development, but does not become workable code or get maintained as a deliverable once the final system or process is implemented. This method is helpful for identifying functionality or processes that are not easily elicited by other techniques, have conflicting points of view, or are difficult to understand. These prototypes can be an inexpensive tool to uncover or confirm requirements that go beyond an interface including requirements related to processes, data, and business rules.
- **Evolutionary or Functional**: prototypes are created to extend initial requirements into a functioning solution as requirements are further defined through stakeholder use. This approach produces a working solution and usually requires a specialized prototyping tool or language. These prototypes may be used in the final solution. If specialized software is used, business processes, rules, and data can be simulated to evaluate the impact of changes and validate desired outcomes.

.2 Prototyping Examples

There are many forms of prototyping in use today.

Each of the following can be considered a form of prototyping:

- **Proof of Principle or Proof of Concept**: is a model created to validate the design of a system without modelling the appearance, materials used in the creation of work, or processes/workflows ultimately used by the stakeholders.
- **Form Study Prototype**: is used to explore the basic size, look, and feel of a product that will be manufactured, without creating actual functionality. It is used to assess ergonomic and visual factors using a sculptural representation of the product made from inexpensive materials. This type of prototype may also be used to model a workflow or navigation at a high

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level in order to identify gaps or inconsistencies in the possible solution of the properties (for example, appearance, configuration).

- **Usability Prototype**: is a product model created to test how the end user interacts with the system without including any of the properties (for example, appearance, configuration).
- **Visual Prototype**: is a product model created to test the visual aspects of the solution without modelling the complete functionality.
- **Functional Prototype**: is a model created to test software functionality, qualities of the system for the user (for example, appearance), and workflow. It is also referred to as a working model and is used both to simulate business processes and business rules and to evaluate software function calls.

.3 Prototyping Methods

The following is a list of commonly used methods for prototyping:

- **Storyboarding**: is used to visually and textually detail the sequence of activities by summing up different user interactions with the solution or enterprise.
- **Paper Prototyping**: uses paper and pencil to draft an interface or process.
- **Workflow Modelling**: depicts a sequence of operations that are performed and usually focuses solely on the human aspect.
- **Simulation**: is used to demonstrate solutions or components of a solution. It may test various processes, scenarios, business rules, data, and inputs.

10.36.4 Usage Considerations

.1 Strengths

- Provides a visual representation for the future state.
- Allows for stakeholders to provide input and feedback early in the design process.
- When using throw-away or paper prototyping methods, users may feel more comfortable being critical of the mock-up because it is not polished and release-ready.
- A narrow yet deep vertical prototype can be used for technical feasibility studies, proof of concept efforts, or to uncover technology and process gaps.

.2 Limitations

- If the system or process is highly complex, the prototyping process may become bogged down with discussion of 'how' rather than 'what', which can make the process take considerable time, effort, and facilitation skill.
- Underlying technology may need to be understood or assumed in order to initiate prototyping.

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- If the prototype is deeply elaborate and detailed, stakeholders may develop unrealistic expectations for the final solution. These can range from assumed completion dates to higher expectations of performance, reliability, and usability.
- Stakeholders may focus on the design specifications of the solution rather than the requirements that any solution must address. This can, in turn, constrain the solution design. Developers may believe that they must provide a user interface that precisely matches the prototype, even if more elegant technology and interface approaches exist.

10.37 Reviews

10.37.1 Purpose

Reviews are used to evaluate the content of a work product.

10.37.2 Description

Different types of reviews are conducted for business analysis work products.

Each is tailored to the needs of the organization and business analyst, and uses these dimensions:

- **Objectives**: defining the purpose of the review.
- **Techniques**: identifying either a formal or informal way to perform the review.
- **Participants**: identifying who should take part in the review activity.

Each review is focused on a work product, not the skills or actions of the participants. The work product may be a package of several deliverables, a single deliverable, a portion of a deliverable, or work in process. For a completed work product, the objective of the review is usually to remove defects or inform the reviewers about the content. For work in process, the review may be conducted to resolve an issue or question.

Each review includes the business analyst as a participant. Reviewers may be peers, especially for work in process, or stakeholders, who validate that the work product is complete and correct. The review steps depend on the technique used.

Reviews can include:

- an overview of the work product and review objectives,
- checklists and reference materials that can be used by reviewers,
- reviewing the work product and documenting the findings, and
- verifying any rework.

Using feedback from reviewers, the business analyst updates the work product.

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10.37.3 Elements

.1 Objectives

Objectives are clearly communicated to all participants prior to the review.

Objectives may include one or more goals, for example:

- to remove defects,
- to ensure conformance to specifications or standards,
- to ensure the work product is complete and correct,
- to establish consensus on an approach or solution,
- to answer a question, resolve an issue, or explore alternatives,
- to educate reviewers about the work product, and
- to measure work product quality.

.2 Techniques

Reviews can be formal or informal. The techniques used during a review are selected to support the objectives of the review.

The following techniques are commonly used by business analysts when conducting reviews:

- **Inspection**: a formal technique that includes an overview of the work product, individual review, logging the defects, team consolidation of defects, and follow-up to ensure changes were made. The focus is to remove defects and create a high quality work product. While usually performed by peers, it can also be used for stakeholder reviews.
- **Formal Walkthrough (also known as Team Review)**: a formal technique that uses the individual review and team consolidation activities often seen in inspection. Walkthroughs are used for peer reviews and for stakeholder reviews.
- **Single Issue Review (also known as Technical Review)**: a formal technique focused on either one issue or a standard in which reviewers perform a careful examination of the work product prior to a joint review session held to resolve the matter in focus.
- **Informal Walkthrough**: an informal technique in which the business analyst runs through the work product in its draft state and solicits feedback. Reviewers may do minimal preparation before the joint review session.
- **Desk Check**: an informal technique in which a reviewer who has not been involved in the creation of the work product provides verbal or written feedback.
- **Pass Around**: an informal technique in which multiple reviewers provide verbal or written feedback. The work product may be reviewed in a common copy of the work product or passed from one person to the next.

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- **Ad hoc**: an informal technique in which the business analyst seeks informal review or assistance from a peer.

.3 Participants

Participant roles involved in any particular review depend on the objectives of the review, the selected technique, and any organizational standards that may be in place.

In some situations, a supervisor or manager may be one of the reviewers because of their expertise. In these situations, the moderator is careful to avoid adversely affecting the level of candour of other participants or inappropriately affecting decisions of the team.

Table 10.37.1: Review Roles

Role	Description	Responsibility	Applicable Techniques
Author	Author of the work product.	Answers questions about the work product and listens to suggestions and comments. Incorporates changes into the work product after the review.	All
Reviewer	A peer or stakeholder.	Examines the work product according to the review objectives. For defect detection reviews, the reviewer examines the work product prior to a review session and keeps track of both defects found and suggestions for improvement.	All
Facilitator	A neutral facilitator (should not be the author in order to avoid compromising the review).	Facilitates the review session, keeps participants focused on the objectives of the review and ensures that each relevant section of the work product is covered. Validates that reviewers have examined the work product before the session begins and ensures that all reviewers participate in the review session.	• Inspection • Formal walkthrough • May be helpful for single issue review
Scribe	A neutral participant with strong communication skills.	Documents all defects, suggestions, comments, issues, concerns, and outstanding questions that are raised during a review session. Familiarity with the subject matter enables the scribe to capture items clearly.	• Inspection • Formal and informal walkthrough

10.37.4 Usage Considerations

.1 Strengths

- Can help identify defects early in the work product life cycle, eliminating the need for expensive removal of defects discovered later in the life cycle.
- All parties involved in a review become engaged with the final outcome; they have a vested interest in a quality result.

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- Desk checks and pass around reviews can be performed by a reviewer at a convenient time, rather than interrupting work in progress to attend a meeting.

.2 Limitations

- Rigorous team reviews take time and effort. Thus, only the most critical work products might be reviewed using inspection or formal walkthrough techniques.
- Informal reviews by one or two reviewers are practical in terms of the effort required, but they provide less assurance of removing all significant defects than using a larger team and more formal process.
- For desk checks and pass around reviews it may be difficult for the author to validate that an independent review was done by each participant.
- If review comments are shared and discussed via e-mail there may be many messages to process, which makes it difficult for the author to resolve disagreements or differences in suggested changes.

10.38 Risk Analysis and Management

10.38.1 Purpose

Risk analysis and management identifies areas of uncertainty that could negatively affect value, analyzes and evaluates those uncertainties, and develops and manages ways of dealing with the risks.

10.38.2 Description

Failure to identify and manage risks may negatively affect the value of the solution. Risk analysis and management involves identifying, analyzing, and evaluating risks. Where sufficient controls are not already in place, business analysts develop plans for avoiding, reducing, or modifying the risks, and when necessary, implementing these plans.

Risk management is an ongoing activity. Continuous consultation and communication with stakeholders helps to both identify new risks and to monitor identified risks.

10.38.3 Elements

.1 Risk Identification

Risks are discovered and identified through a combination of expert judgment, stakeholder input, experimentation, past experiences, and historical analysis of similar initiatives and situations. The goal is to identify a comprehensive set of relevant risks and to minimize the unknowns. Risk identification is an ongoing activity.

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A risk event could be one occurrence, several occurrences, or even a non-occurrence. A risk condition could be one condition or a combination of conditions. One event or condition may have several consequences, and one consequence may be caused by several different events or conditions.

Each risk can be described in a risk register that supports the analysis of those risks and plans for addressing them.

Figure 10.38.1: Example of a Risk Register

#	Risk Event or Condition	Consequence	Probability	Impact	Risk Level	Risk Modification Plan	Risk Owner	Residual Risk		
								Probability	Impact	Risk Level
1	If the union does not agree with changes to job descriptions	then planned staff changes will not be able to occur	Medium	Medium	Medium	Begin consultations with the union no later than next month	Marta	Low	Low	Low
2	If subject matter experts are not available for requirements elicitation	then scope and quality will be reduced, and the delivery date will be pushed back	Medium	High	High	Develop a plan for when the SME's are required, hold on-site workshops and obtain agreement from the sponsor about their participation	Deepak	Low	Medium	Low
3	If an insufficient number of customers reply to our survey	then we will not have a representative sample of customer requirements	Medium	High	High	Contract with a firm that specializes in survey management to develop and run the survey	François	Low	Medium	Low
4	If the organizational structure does not adjust to the new business processes	then the enterprise will not be able to achieve the planned efficiencies and the business need will not be met	High	High	High	The business sponsor must approve the organizational changes prior to deployment, and the changes must occur prior to deployment	Jiahui	Medium	Low	Medium

.2 Analysis

Analysis of a risk involves understanding the risk, and estimating the level of a risk. Sometimes controls may already be in place to deal with some risks, and these should be taken into account when analyzing the risk.

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The likelihood of occurrence could be expressed either as a probability on a numerical scale or with values such as Low, Medium, and High.

The consequences of a risk are described in terms of their impact on the potential value. The impact of any risk can be described in terms of cost, duration, solution scope, solution quality, or any other factor agreed to by the stakeholders such as reputation, compliance, or social responsibility.

Table 10.38.1: Example of a Risk Impact Scale

	Scope	Quality	Cost	Effort	Duration	Reputation	Social Responsibility
Low Impact	Minor areas of scope are affected	Minor quality problems	Less than 1% cost impact	Less than 2% extra days effort	Delay of up to 3%	Very minor impact to enterprise's reputation	Minor impediment
Medium Impact	Major areas of scope are affected, but workarounds are feasible	Significant quality issues, but the product is still usable	More than 1% but less than 3% impact	2% -10% extra days effort	Delay of 3%-10%	Moderate impact to enterprise's reputation	Major impediment
High Impact	The product does not meet the business need	The product is not usable	More than 3% impact	More than 10% extra days effort	Delay of more than 10%	Severe impact to enterprise's reputation	Severe impediment

While an enterprise may have a standard or baseline risk impact scale, the categories like cost, effort, and reputation, and the thresholds may be adjusted to consider the potential value and the level of risk that is acceptable. Typically, three to five broad categories of level are used to describe how to interpret the potential impact.

The level of a given risk may be expressed as a function of the probability of occurrence and the impact. In many cases, it is a simple multiplication of probability and impact. The risks are prioritized relative to each other according to their level. Risks which could occur in the near term may be given a higher priority than risks which are expected to occur later. Risks in some categories such as reputation or compliance may be given higher priority than others.

.3 Evaluation

The risk analysis results are compared with the potential value of the change or of the solution to determine if the level of risk is acceptable or not. An overall risk level may be determined by adding up all the individual risk levels.

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.4 Treatment

Some risks may be acceptable, but for other risks it may be necessary to take measures to reduce the risk.

One or more approaches for dealing with a risk may be considered, and any combination of approaches could be used to address a risk:

- **Avoid**: either the source of the risk is removed, or plans are adjusted to ensure that the risk does not occur.
- **Transfer**: the liability for dealing with the risk is moved to, or shared with, a third party.
- **Mitigate**: reduce the probability of the risk occurring or the possible negative consequences if the risk does occur.
- **Accept**: decide not to do anything about the risk. If the risk does occur, a workaround will be developed at that time.
- **Increase**: decide to take on more risk to pursue an opportunity.

Once the approach for dealing with a specific risk is selected, a risk response plan is developed and assigned to a risk owner with responsibility and authority for that risk. In the case of risk avoidance, the risk owner takes steps to ensure that the probability or the impact of the risk is reduced to nil. For those risks which cannot be reduced to nil, the risk owner is responsible for monitoring the risk, and for implementing a risk mitigation plan.

The risk is re-analyzed to determine the residual risk which is the new probability and new impact as a result of the measures taken to modify the risk. There could be a cost-benefit analysis done to determine if the cost and effort of the measures reduces the level of risk enough to make it worthwhile. The risks may be re-evaluated in terms of the residual risk.

Stakeholders should be informed of the plans for modifying the risks.

10.38.4 Usage Considerations

.1 Strengths

- Can be applied to strategic risks which affect long-term value of the enterprise, tactical risks which affect the value of a change, and operational risks which affect the value of a solution once the change is made.
- An organization typically faces similar challenges on many of its initiatives. The successful risk responses on one initiative can be useful lessons learned for other initiatives.
- The risk level of a change or of a solution could vary over time. Ongoing risk management helps to recognize that variation, and to re-evaluate the risks and the suitability of the planned responses.

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.2 Limitations

- The number of possible risks to most initiatives can easily become unmanageably large. It may only be possible to manage a subset of potential risks.
- There is the possibility that significant risks are not identified.

10.39 Roles and Permissions Matrix

10.39.1 Purpose

A roles and permissions matrix is used to ensure coverage of activities by denoting responsibility, to identify roles, to discover missing roles, and to communicate results of a planned change.

10.39.2 Description

Role and permission allocation involves identifying roles, associating these with solution activities, and then denoting authorities who can perform these activities. A role is a label for a group of individuals who share common functions. Each function is portrayed as one or more solution activities. A single activity can be associated with one or more roles by designating authorities. Each individual that is assigned this authority can perform the associated activity.

The following is an example of a roles and permissions matrix for a software system.

Figure 10.39.1: Roles and Permissions Matrix

Roles and Permissions Matrix	Role Group 1	Administrator	Manager	Role Group 2	Sales	Customer
Activity						
Create new account		X	X			X
Modify account		X	X			X
Create order		X	X		X	X
View reports		X	X		X	
Create reports		X	X		X	

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10.39.3 Elements

.1 Identifying Roles

To identify roles for either internal or external stakeholders, business analysts:

- review any organizational models, job descriptions, procedure manuals, and system user guides, and
- meet with stakeholders to uncover additional roles.

Through this review and discussion, the business analyst considers both that individuals with the same job title may have different roles and that individuals with different job titles may have the same roles.

When identifying roles, business analysts look for common functions that are performed by individuals with similar needs.

.2 Identifying Activities

Business analysts frequently use functional decomposition to break down each function into sub-parts, process modelling to better understand the workflow and division of work among users, and use cases to represent tasks. By performing these techniques, the business analyst can ensure that all functions are accounted for and their activities are identified among various use case scenarios.

There may be different levels of abstraction for roles and permission matrices based on the business analysis perspective. Initiative level roles and responsibilities may be identified in a RACI (Responsible, Accountable, Consulted, Informed) matrix. Specific information technology system roles and responsibilities may be identified in a CRUD (Create, Read, Update, and Delete) matrix.

.3 Identifying Authorities

Authorities are actions that identified roles are permitted to perform. For each activity, the business analyst identifies the authorities for each role. When identifying authorities, business analysts consider the level of security needed and how the work flows through the process. Business analysts collaborate with stakeholders to validate identified authorities.

.4 Refinements

Delegations

The business analyst may also identify which authorities can be delegated by one individual to another on a short-term or permanent basis.

Inheritances

Stakeholders may request that when an individual is assigned an authority at an organizational hierarchy level that this assignment pertain to only that user's organizational level and any subsidiary organizational unit levels.

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10.39.4 Usage Considerations

.1 Strengths

- Provides procedural checks and balances, as well as data security, by restricting individuals from performing certain actions.
- Promotes improved review of transaction history, in that audit logs can capture details about any assigned authorities at the time.
- Provides documented roles and responsibilities for activities.

.2 Limitations

- Need to recognize the required level of detail for a specific initiative or activity; too much detail can be time-consuming and not provide value, too little detail can exclude necessary roles or responsibilities.

10.40 Root Cause Analysis

10.40.1 Purpose

Root cause analysis is used to identify and evaluate the underlying causes of a problem.

10.40.2 Description

Root cause analysis is a systematic examination of a problem or situation that focuses on the problem's origin as the proper point of correction rather than dealing only with its effects. It applies an iterative analysis approach in order to take into account that there might be more than one root cause contributing to the effects. Root cause analysis looks at the main types of causes such as people (human error, lack of training), physical (equipment failure, poor facility), or organizational (faulty process design, poor structure).

Root cause analysis helps organize the information in a framework, which allows for deeper analysis if needed. Root cause analysis can be used for:

- **Reactive Analysis**: identifying the root cause(s) of an occurring problem for corrective action, or
- **Proactive Analysis**: identifying potential problem areas for preventive action.

Root cause analysis uses four main activities:

- **Problem Statement Definition**: describes the issue to be addressed.
- **Data Collection**: gathers information about the nature, magnitude, location, and timing of the effect.
- **Cause Identification**: investigates the patterns of effects to discover the specific actions that contribute to the problem.

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- **Action Identification**: defines the corrective action that will prevent or minimize recurrence.

10.40.3 Elements

.1 The Fishbone Diagram

A fishbone diagram (also known as an Ishikawa or cause-and-effect diagram) is used to identify and organize the possible causes of a problem. This tool helps to focus on the cause of the problem versus the solution and organizes ideas for further analysis. The diagram serves as a map that depicts possible cause-and-effect relationships.

Steps to develop a fishbone diagram include:

Step 1. Capturing the issue or problem under discussion in a box at the top of the diagram.

Step 2. Drawing a line from the box across the paper or whiteboard (forming the spine of the fishbone).

Step 3. Drawing diagonal lines from the spine to represent categories of potential causes of the problem. The categories may include people, processes, tools, and policies.

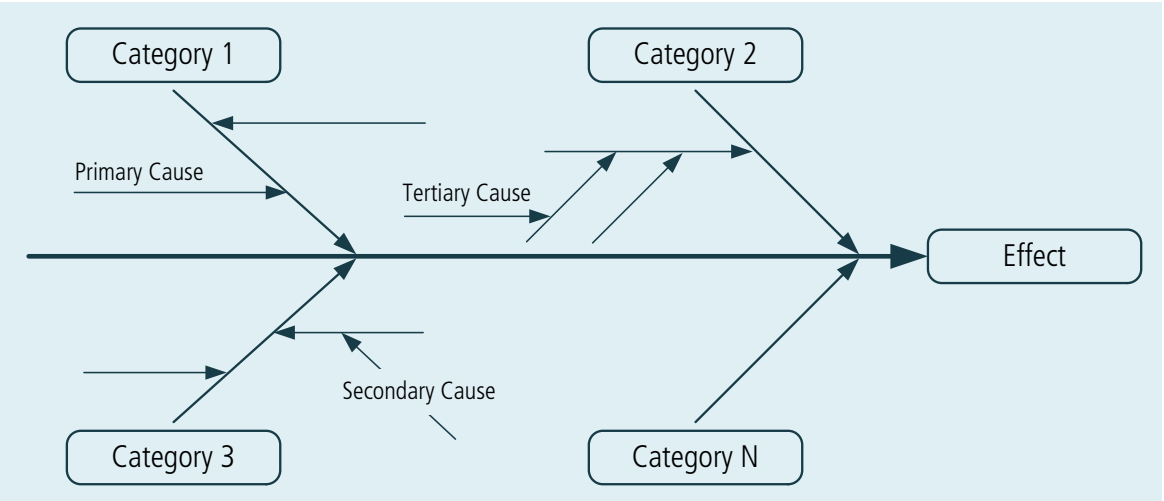
Step 4. Drawing smaller lines to represent deeper causes.

Step 5. Brainstorming categories and potential causes of the problem and capturing them under the appropriate category.

Step 6. Analyzing the results. Remember that the group has identified only potential causes of the problem. Further analysis is needed to validate the actual cause, ideally with data.

Step 7. Brainstorming potential solutions once the actual cause has been identified.

Figure 10.40.1: Fishbone Diagram



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.2 The Five Whys

The five whys is a question asking process to explore the nature and cause of a problem. The five whys approach repeatedly asks questions in an attempt to get to the root cause of the problem. This is one of the simplest facilitation tools to use when problems have a human interaction component.

To use this technique:

Step 1. Write the problem on a flip chart or whiteboard.

Step 2. Ask "Why do you think this problem occurs?" and capture the idea below the problem.

Step 3. Ask "Why?" again and capture that idea below the first idea.

Continue with step 3 until you are convinced the actual root cause has been identified. This may take more or less than five questions—the technique is called the five whys because it often takes that many to reach the root cause, not because the question must be asked five times.

The five whys can be used alone or as part of the fishbone diagram technique. Once all ideas are captured in the diagram, use the five whys approach to drill down to the root causes.

10.40.4 Usage Considerations

.1 Strengths

- Helps to maintain an objective perspective when performing cause-and-effect analysis.
- Enables stakeholders to specify an effective solution at the appropriate points for corrective action.

.2 Limitations

- Works best when the business analyst has formal training to ensure the root causes, not just symptoms of the problem, are identified.
- May be difficult with complex problems; the potential exists to lead to a false trail and/or dead–end conclusion.

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10.41 Scope Modelling

10.41.1 Purpose

Scope models define the nature of one or more limits or boundaries and place elements inside or outside those boundaries.

10.41.2 Description

Scope models are commonly used to describe the boundaries of control, change, a solution, or a need. They may also be used to delimit any simple boundary (as distinct from horizons, emergent properties, and recursive systems).

These models may show elements that include:

- **In-scope**: the model identifies a boundary as seen from inside, as well as the elements contained by that boundary (for example, functional decomposition).
- **Out-of-scope**: the model identifies a boundary as seen from outside, as well as the elements that are not contained by that boundary (for example, context diagram).
- **Both**: the model identifies a boundary as seen from both sides, as well as elements on both sides of the boundary (for example, venn diagram or use case model).

Scope models provide the basis for understanding the boundaries of:

- **Scope of Control**: what is being analyzed, roles and responsibilities, and what is internal and external to the organization.
- **Scope of Need**: stakeholder needs, value to be delivered, functional areas, and organizational units to be explored.
- **Scope of Solution**: requirements met, value delivered, and impact of change.
- **Scope of Change**: actions to be taken, stakeholders affected or involved, and events to cause or prevent.

Scope models are typically represented as a combination of diagrams, matrices, and textual explanations. If the scope is implemented in phases or iterations, the scope model should be described per each phase or iteration.

10.41.3 Elements

.1 Objectives

Scope models are typically used to clarify the:

- span of control,
- relevance of elements, and
- where effort will be applied.

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Depending on the action or stakeholder needs the model supports, a business analyst determines the types of models to be used and selects boundaries and elements.

.2 Scope of Change and Context

Typically, business analysts are concerned with elements that will be altered as part of a change, as well as external elements that are relevant to the change. For elements inside the scope of change, the business analyst is involved in establishing the ways those elements are modified. For elements outside the scope of change but relevant to the change, the business analyst is involved in establishing the interactions between the change, the current and proposed solutions, and the context.

The business analyst often determines:

- business processes to be defined or modified,
- business functions to be added, changed, optimized, or re-assigned,
- new capabilities to be built or existing capabilities to be changed,
- external and internal events to be responded to,
- use cases and situations to be supported,
- technologies to be changed or replaced,
- informational assets to be acquired, produced, or processed,
- stakeholders and organizational roles impacted by the change,
- external and internal agents and entities impacted by the change,
- organizations and organizational units (departments, teams, groups) impacted by the change, and
- systems, components, tools, and physical assets required for the change or impacted by the change.

.3 Level of Detail

The purpose of analysis defines the appropriate level of abstraction at which scope elements are described. A proper level of detail provides a meaningful reduction of uncertainty while preventing 'analysis paralysis' at a scope definition stage. The elements of the final scope model can be described by enumerating them, by referring to a specific level of their decomposition hierarchy, or by grouping them into logically bound sets. For example, a subject of change can be defined as a list of specific business processes, as a high-level business process encompassing all of them, or as a generic business function. Similarly, stakeholders included in the scope can be defined by enumerating specific titles or by referring to their common organizational role.

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.4 Relationships

Exploring relationships between potential scope elements helps to ensure completeness and integrity of the scope model by identifying their dependencies or by discovering other elements involved in or impacted by the change.

Various diagramming techniques are available for exploring relationships of specific types, including:

- **Parent-Child or Composition-Subset**: relates elements of the same type by way of hierarchical decomposition. Relationships of this type appear as an organization chart, in a class or entity-relationship diagram, as sub-processes in a business process model, or as composite states on a state diagram.
- **Function-Responsibility**: relates a function with the agent (stakeholder, organizational unit, or solution component) that is responsible for its execution. Relationships of this type appear on business process models and on collaboration, sequence, and use case diagrams.
- **Supplier-Consumer**: relates elements by way of the transmission of information or materials between them. Elements can be processes, systems, solution components, and organizational units, for both internal and external entities. Relationships of this type occur in data flow diagrams, business process models, and in collaboration, sequence, and robustness diagrams.
- **Cause-Effect**: relates elements by logical contingency in order to identify chains of associated elements that are involved in or impacted by the change. Relationships of this type appear in fishbone (Ishikawa) diagrams and other cause-effect diagrams.
- **Emergent**: in most complex systems, several elements can interact to produce results that cannot be predicted or understood based on the components alone.

.5 Assumptions

At a time of scope modelling, the validity of the model heavily relies on assumptions such as the definition of needs, causality of outcomes, impact of changes, applicability, and feasibility of the solution. The resulting scope model should include explicit statements of critical assumptions and their implications.

.6 Scope Modelling Results

Results of scope modelling can be represented as:

- textual descriptions of elements, including criteria for making in-scope or out-of-scope decisions,
- diagrams illustrating relationships of scope elements, and
- matrices depicting dependencies between scope elements.

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10.41.4 Usage Considerations

.1 Strengths

- A scope model facilitates agreement as a basis for:
- defining contractual obligations,
- estimating the project effort,
- justifying in-scope/out-of-scope decisions in requirements analysis, and
- assessing the completeness and impact of solutions.

.2 Limitations

- An initial, high-level model can lack a sufficient level of granularity, particularly for boundary elements, that is needed to ensure clear scope identification.
- Once a scope is defined, changing it may be difficult due to political reasons and contractual obligations. Meanwhile, many factors can affect the scope validity before the targets are achieved. Such factors as wrong initial assumptions, situation change, evolution of stakeholder needs, or technology innovations may cause a need for revising the scope partially or entirely.
- Traditional scope models cannot address common complex boundaries, such as a horizon (a boundary that is completely dependent on the position of the stakeholder).

10.42 Sequence Diagrams

10.42.1 Purpose

Sequence diagrams are used to model the logic of usage scenarios by showing the information passed between objects in the system through the execution of the scenario.

10.42.2 Description

A sequence diagram shows how processes or objects interact during a scenario. The classes required to execute the scenario and the messages they pass to one another (triggered by steps in the use case) are displayed on the diagram. The sequence diagram shows how objects used in the scenario interact, but not how they are related to one another. Sequence diagrams are also often used to show how user interface components or software components interact.

The diagram represents information in a horizontal and vertical alignment. The objects that send messages to each other are represented as boxes that are aligned at the top of the page from the left to the right, with each object occupying a column of space on the page bordered by a vertical line stretching down to the bottom of the page. The messages that are sent from one object to

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the next are represented as horizontal arrows. The order of the messages is represented in a top-down and left-to-right sequence beginning with the first message at the top left of the page and subsequent messages occurring to the right and below. Sequence diagrams are sometimes called event diagrams.

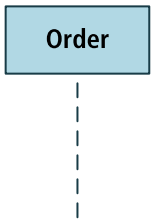
The standard notation for sequence diagrams is defined as part of the Unified Modelling Language™ (UML®) specification.

10.42.3 Elements

.1 Lifeline

A lifeline represents the lifespan of an object during the scenario being modelled in a sequence diagram. The example below shows the object order. A lifeline is drawn as a dashed line that vertically descends from each object box to the bottom of the page.

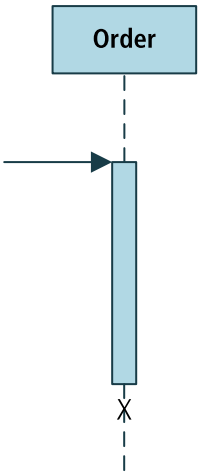
Figure 10.42.1: Lifeline



.2 Activation Box

An activation box represents the period during which an operation is executed. A call to activate is represented by an arrow with a solid arrowhead leading to the activation object. The lifeline can be terminated with an X.

Figure 10.42.2: Activation Box



.3 Message

A message is an interaction between two objects. A message is shown as an arrow coming from the activation box of the object that sends the message to the

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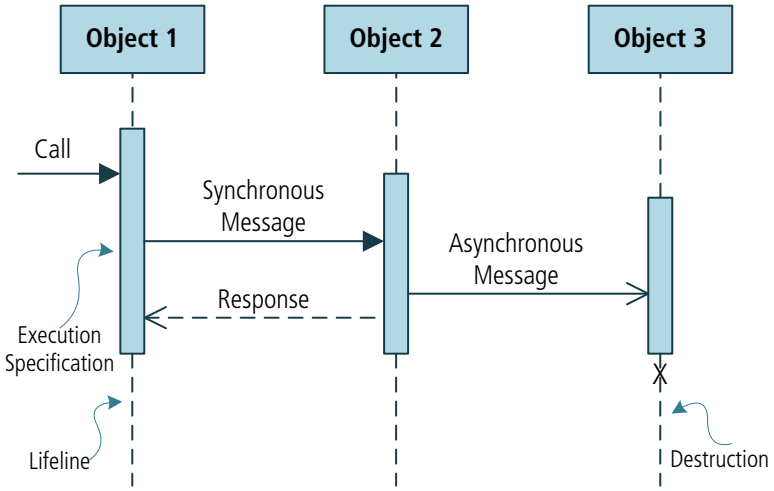
activation box of the object that receives the message.

The name of the message is placed on top of the arrowed line. There are different types of messages:

- **Synchronous Call**: transfers control to the receiving object. The sender cannot act until a return message is received.
- **Asynchronous Call**: (also known as a signal) allows the object to continue with its own processing after sending the signal. The object may send many signals simultaneously, but may only accept one signal at a time.

Figure 10.42.3: Message



10.42.4 Usage Considerations

.1 Strengths

- Shows the interaction between the objects of a system in the chronological order that the interactions occur.
- Shows the interaction between the objects in a visual manner that allows the logic to be validated by stakeholders with relative ease.
- Use cases can be refined into one or more sequence diagrams in order to provide added detail and a more in-depth understanding of a business process.

.2 Limitations

- Time and effort can be wasted creating a complete set of sequence diagrams for each use case of a system, which may not be necessary.
- Have historically been used for modelling system flows and may be considered too technical in other circumstances.

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10.43 Stakeholder List, Map, or Personas

10.43.1 Purpose

Stakeholder lists, maps, and personas assist the business analyst in analyzing stakeholders and their characteristics. This analysis is important in ensuring that the business analyst identifies all possible sources of requirements and that the stakeholder is fully understood so decisions made regarding stakeholder engagement, collaboration, and communication are the best choices for the stakeholder and for the success of the initiative.

10.43.2 Description

Stakeholder analysis involves identifying the stakeholders that may be affected by a proposed initiative or that share a common business need. Stakeholder analysis notes, considers, and analyzes the various characteristics of the identified stakeholders.

Common types of stakeholder characteristics that are worth identifying and analyzing include:

- level of authority within the domain of change and within the organization,
- attitudes toward or interest in the change being undertaken,
- attitudes toward the business analysis work and role, and
- level of decision-making authority.

For details on the work involved in conducting a thorough stakeholder analysis, see Plan Stakeholder Engagement (p. 31).

When analyzing stakeholders, business analysts utilize one or more techniques to draw out a list of stakeholders and analyze them. Stakeholder lists, maps, and personas are three tools that can be utilized when conducting this work.

10.43.3 Elements

.1 Stakeholder Lists

A business analyst may apply a number of techniques to generate a stakeholder list. Brainstorming and interviews are two common techniques that can be used. The goal is to ensure a thorough list is produced because this list is central to both stakeholder analysis activities and the planning work the business analyst performs for elicitation, collaboration, and communication.

Stakeholder lists may become quite lengthy. As the analysis is conducted, the business analyst categorizes and adds structure to the list. It is important to have an exhaustive list to ensure that no important stakeholder or stakeholder group has been overlooked, which opens up the risk that requirements will be missed later on.

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.2 Stakeholder Map

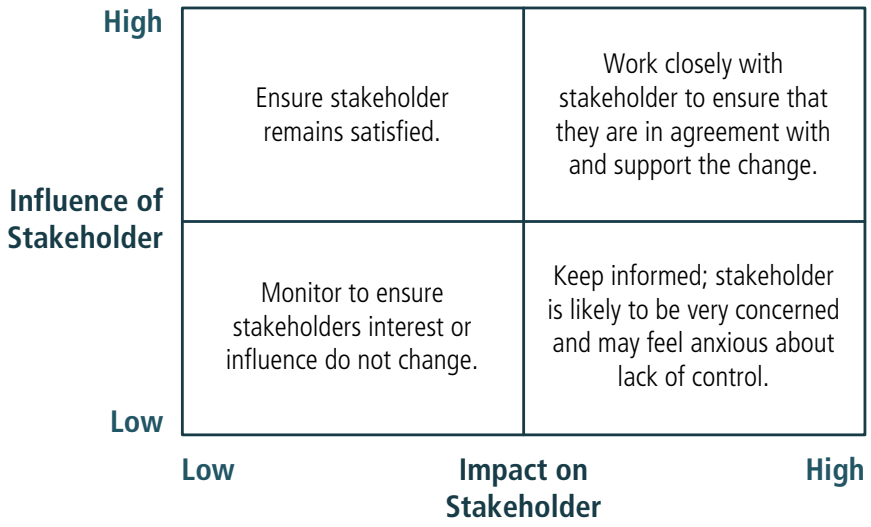
Stakeholder maps are diagrams that depict the relationship of stakeholders to the solution and to one another.

There are many forms of stakeholder maps, but two common ones include:

- **Stakeholder Matrix**: maps the level of stakeholder influence against the level of stakeholder interest.
- **Onion Diagram**: indicates how involved the stakeholders are with the solution, which stakeholders will directly interact with the solution or participate in a business process, which are part of the larger organization, and which are outside the organization.

The business analyst typically starts their stakeholder analysis by reviewing the proposed scope of the solution and then analyzing which groups will be impacted. At the start of this analysis, the business analyst may produce a stakeholder matrix to identify each stakeholder and their role as it pertains to the development of the requirements. Throughout a project, a stakeholder's position on the matrix can change due to organizational, environmental, or requirement scope changes. Due to these potential changes, stakeholder analysis is considered iterative and reviewed frequently by the business analyst.

Figure 10.43.1: Stakeholder Matrix



- **High Influence/High Impact**: the stakeholders are key players in the change effort. The business analyst should focus their efforts and engage this group regularly.
- **High Influence/Low Impact**: the stakeholders have needs that should be met. The business analyst should engage and consult with them, while also attempting to engage them and increase their level of interest with the change activity.
- **Low Influence/High Impact**: the stakeholders are supporters of and potential goodwill ambassadors for the change effort. The business analyst should engage this group for their input and show interest in their needs.

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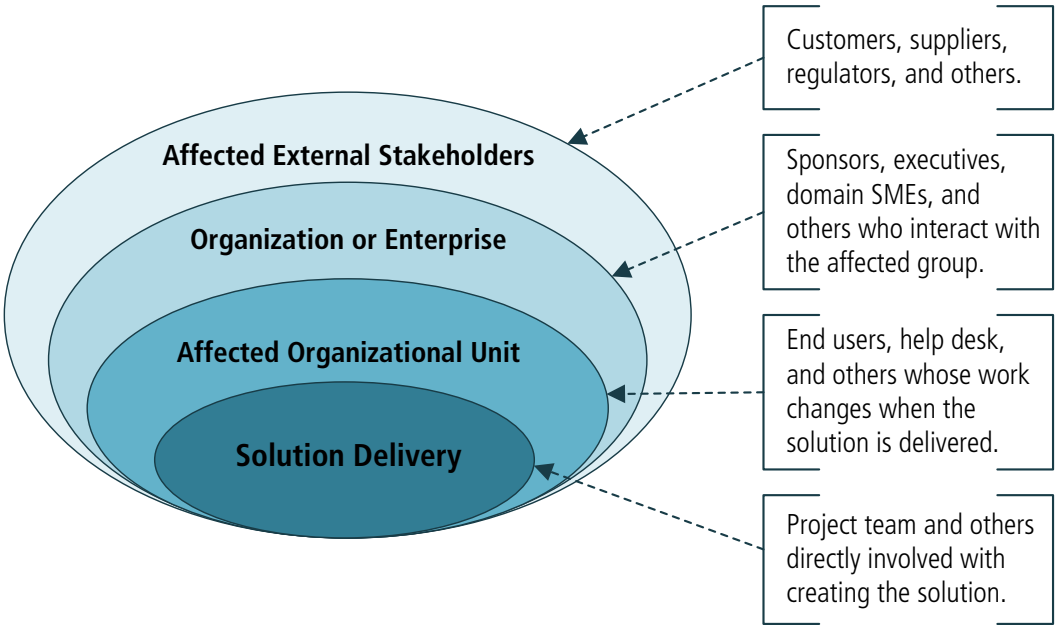
- **Low Influence/Low Impact**: the stakeholders can be kept informed using general communications. Additional engagement may move them into the goodwill ambassador quadrant, which can help the effort gain additional support.

Figure 10.43.2: Stakeholder Onion Diagram



.3 Responsibility (RACI) Matrix

Another popular stakeholder matrix is the responsibility (RACI) matrix. RACI stands for the four types of responsibility that a stakeholder may hold on the initiative: Responsible, Accountable, Consulted, and Informed. When completing a RACI matrix, it is important to ensure that all stakeholders or stakeholder groups have been identified. Further analysis is then conducted to assign the RACI designation in order to specify the level of responsibility expected from each stakeholder and/or group. It is common practice to define each term so that a consistent understanding of the assignment and associated roles are understood by any stakeholders utilizing the RACI matrix.

- **Responsible (R)**: the persons who will be performing the work on the task.
- **Accountable (A)**: the person who is ultimately held accountable for successful completion of the task and is the decision maker. Only one stakeholder receives this assignment.
- **Consulted (C)**: the stakeholder or stakeholder group who will be asked to provide an opinion or information about the task. This assignment is often provided to the subject matter experts (SMEs).
- **Informed (I)**: a stakeholder or stakeholder group that is kept up to date on the task and notified of its outcome. Informed is different from Consulted as with Informed the communication is one-direction (business analyst to stakeholder) and with Consulted the communication is two-way.

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Figure 10.43.3: RACI Matrix

Change Request Process	RACI
Executive Sponsor	A
Business Analyst	R
Project Manager	C
Developer	C
Tester	I
Trainer	I
Application Architect	C
Data Modeller	C
Database Analyst (DBA)	C
Infrastructure Analyst	C
Business Architect	R
Information Architect	C
Solution Owner	C
Subject Matter Expert (SME)	C
Other Stakeholders	R C I (varies)

.4 Personas

A persona is defined as a fictional character or archetype that exemplifies the way a typical user interacts with a product. Personas are helpful when there is a desire to understand the needs held by a group or class of users. Although the user groups are fictional, they are built to represent actual users. Research is conducted to understand the user group, and the personas are then created based upon knowledge rather than opinion. A number of elicitation techniques can be utilized to conduct this research. Interviews and surveys/questionnaires are two techniques commonly used to elicit this information. The persona is written in narrative form and focuses on providing insight into the goals of the group. This allows the reader to see the story from the point of view of the stakeholder group. Personas help bring the user to life, which in turn makes the needs feel real to those who design and build solutions.

10.43.4 Usage Considerations

.1 Strengths

- Identifies the specific people who must be engaged in requirements elicitation activities.
- Helps the business analyst plan collaboration, communication, and facilitation activities to engage all stakeholder groups.
- Useful to understand changes in impacted groups over time.

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.2 Limitations

- Business analysts who are continuously working with the same teams may not utilize the stakeholder analysis and management technique because they perceive change as minimal within their respective groups.
- Assessing information about a specific stakeholder representative, such as influence and interest, can be complicated and may feel politically risky.

10.44 State Modelling

10.44.1 Purpose

State modelling is used to describe and analyze the different possible states of an entity within a system, how that entity changes from one state to another, and what can happen to the entity when it is in each state.

10.44.2 Description

An entity is an object or concept within a system. An entity may be used in several processes. The life cycle of every entity has a beginning and an end.

In a state model (also sometimes called a state transition model), a state is a formal representation of a status. It is used when it is necessary to have a precise and consistent understanding of an entity that has complex behaviour and complex rules about that behaviour.

A state model describes:

- a set of possible states for an entity,
- the sequence of states that the entity can be in,
- how an entity changes from one state to another,
- the events and conditions that cause the entity to change states, and
- the actions that can or must be performed by the entity in each state as it moves through its life cycle.

While a process model can show all of the entities that are used in or affected by that process, a state model shows a complementary view: what happens to one entity across all the processes that affect it or use it.

10.44.3 Elements

.1 State

An entity has a finite number of states during its life cycle, although it can be in more than one state at a time. Each state is described with a name and the activities that could be performed while in that state. There may be rules about which activities must or can be performed and which events it can respond to or trigger.

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A complex state can be decomposed into sub-states.

.2 State Transition

How the entity changes or transitions from one state to another could be determined by the steps of a process, by business rules, or by information content. The sequence of states of an entity are not always linear; an entity could skip over several states or revert to a previous state, perhaps more than once.

A transition may be conditional (triggered by a specific event or a condition being reached) or automatic (triggered by the completion of the required activities while in the previous state or by the passage of time). It may also be recursive, leaving one state and returning back to the same state. A transition is described in terms of the event that causes the transition, conditions which determine whether or not the entity must respond to that event, and actions that occur in association with the event.

.3 State Diagram

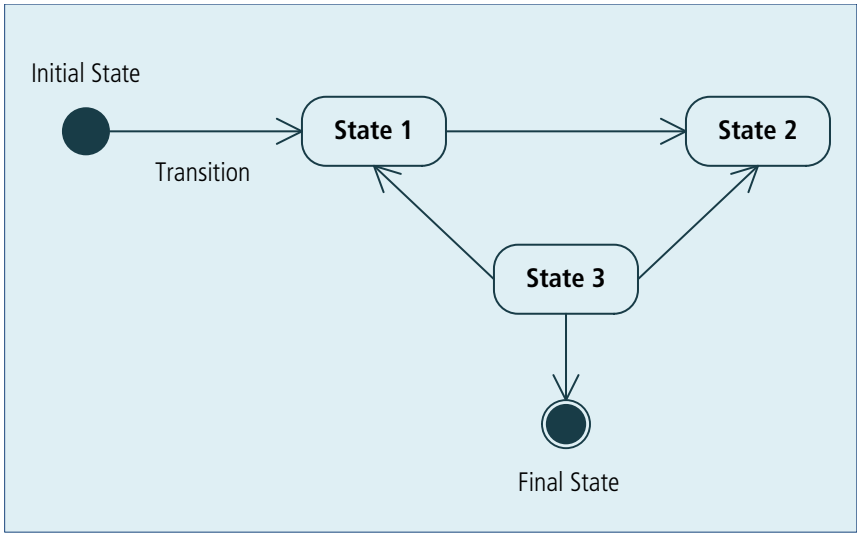
A state diagram shows the life cycle of one entity, beginning when the entity first comes into existence and moving through all of the different states that the entity may have until it is discarded and no longer of use.

A state on a state diagram is shown as a rectangle with rounded corners. There may be any number of states. A state may be decomposed into sub-states.

The transition from one state to another state is shown with a one-directional arrow pointing from the start state to the destination state, optionally labelled with the name of the event that causes the entity's state to change from one state to another, and optionally with conditions and actions.

The beginning and end of the entity's life cycle are shown with special symbols for both the initial state, which indicates that the entity has come into existence, and the final state, which indicates that the entity is discarded and the life cycle is complete.

Figure 10.44.1: State Transition Diagram



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.4 State Tables

A state table is a two-dimensional matrix showing states and the transitions between them. It can be used during elicitation and analysis either as an alternative, a precursor, or a complement to a state diagram. It is a simple way to get started on a state model in order to elicit the state names and event names from the domain subject matter experts.

Each row shows a starting state, the transition, and the end state. If one state could respond to several transitions, there will be a separate row for each transition.

A state that appears as an end state in one row could be a start state in another row.

10.44.4 Usage Considerations

.1 Strengths

- Identifies business rules and information attributes that apply to the entity being modelled.
- Identifies and describes the activities that apply to the entity at different states of the entity.
- Is a more effective documentation and communication tool than plain text, especially if the entity being described has more than a few states, transitions, and conditions governing those transitions.

.2 Limitations

- Is usually only used to understand and communicate about information entities that are perceived to be complex; simple entities may be understood without the time and effort required to build a state model.
- Building a state model appears simple at the start, but achieving a consensus among domain SMEs about the details required by the model can be difficult and time-consuming.
- A high degree of precision about states and transitions is required to build a state diagram; some domain SMEs and business analysis practitioners are uncomfortable trying to describe such a level of detail.

10.45 Survey or Questionnaire

10.45.1 Purpose

A survey or questionnaire is used to elicit business analysis information—including information about customers, products, work practices, and attitudes—from a group of people in a structured way and in a relatively short period of time.

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10.45.2 Description

A survey or questionnaire presents a set of questions to stakeholders and subject matter experts (SMEs), whose responses are then collected and analyzed in order to formulate knowledge about the subject matter of interest. The questions can be submitted in written form or can be administered in person, over the telephone, or using technology that can record responses.

There are two types of questions used in a survey or questionnaire:

- **Close-ended**: the respondent is asked to select from a list of predefined responses, such as a Yes/No response, a multiple-choice selection, a rank/order decision, or a statement requiring a level of agreement. This is useful when the anticipated range of user responses is fairly well defined and understood. The responses to close-ended questions are easier to analyze than those gained from open-ended questions because they can be tied to numerical coefficients.
- **Open-ended**: the respondent is asked to answer questions in a free form without having to select an answer from a list of predefined responses. Open-ended questions are useful when the issues are known and the range of user responses is not. Open-ended questions may result in more detail and a wider range of responses than closed-ended questions. The responses to open-ended questions are more difficult and time-consuming to categorize, quantify, and summarize as they are unstructured and often include subjective language with incomplete or superfluous content.

Questions should be asked in a way that does not influence the response data. They should be expressed in neutral language and should not be structured or sequenced to condition the respondent to provide perceived desirable answers.

10.45.3 Elements

.1 Prepare

An effective survey or questionnaire requires detailed planning in order to ensure that the needed information is obtained in an efficient manner.

When preparing for a survey or questionnaire, business analysts do the following:

- **Define the objective**: a clear and specific objective establishes a defined purpose of the survey or questionnaire. Questions are formulated with the intent of meeting the objective.
- **Define the target survey group**: identifying the group to be surveyed in terms of population size and any perceived variations (for example, culture, language, or location) helps identify factors that can impact survey design.
- **Choose the appropriate survey or questionnaire type**: the objective of the survey or questionnaire determines the appropriate combination of close-ended questions and open-ended questions to elicit the information required.

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- **Select the sample group**: consider both the survey or questionnaire type and the number of people in the identified user group in order to determine if it is necessary and feasible to survey the entire group. It may be important to survey all members—even of a large group—if their demographics indicate a wide variance due to geographic distribution, regulatory differences, or lack of standardization in job function or business process. If the population is large and the survey type is open-ended, it may be necessary to identify a subset of users to engage in the questionnaire process. Using a statistical sampling method will help ensure that the sample selected is representative of the population so that the survey results can be reliably generalized.
- **Select the distribution and collection methods**: determine the appropriate communication mode for each sample group.
- **Set the target level and timeline for response**: determine what response rate is acceptable and when it should be closed or considered complete. If the actual response rate is lower than the acceptable threshold, the use of the survey results may be limited.
- **Determine if the survey or questionnaire should be supported with individual interviews**: as a survey or questionnaire does not provide the depth of data that can be obtained from individual interviews, consider either pre- or post-survey or questionnaire interviews.
- **Write the survey questions**: ensure that all the questions support the stated objectives.
- **Test the survey or questionnaire**: a usability test on the survey identifies errors and opportunities for improvement.

.2 Distribute the Survey or Questionnaire

When distributing the survey or questionnaire it is important to communicate the survey's objectives, how its results will be used, as well as any arrangements for confidentiality or anonymity that have been made.

When deciding on a method of distribution (for example, in-person, e-mail, or survey tool), business analysts consider:

- the urgency of obtaining the results,
- the level of security required, and
- the geographic distribution of the respondents.

.3 Document the Results

When documenting the results of the survey or questionnaire, business analysts:

- collate the responses,
- summarize the results,
- evaluate the details and identify any emerging themes,

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- formulate categories for encoding the data, and
- break down the data into measurable increments.

10.45.4 Usage Considerations

.1 Strengths

- Quick and relatively inexpensive to administer.
- Easier to collect information from a larger audience than other techniques such as interviews.
- Does not typically require significant time from the respondents.
- Effective and efficient when stakeholders are geographically dispersed.
- When using closed-ended questions, surveys can be effective for obtaining quantitative data for use in statistical analysis.
- When using open-ended questions, survey results may yield insights and opinions not easily obtained through other elicitation techniques.

.2 Limitations

- To achieve unbiased results, specialized skills in statistical sampling methods are needed when surveying a subset of potential respondents.
- The response rates may be too low for statistical significance.
- Use of open-ended questions requires more analysis.
- Ambiguous questions may be left unanswered or answered incorrectly.
- May require follow-up questions or more survey iterations depending on the answers provided.

10.46 SWOT Analysis

10.46.1 Purpose

SWOT analysis is a simple yet effective tool used to evaluate an organization's strengths, weaknesses, opportunities, and threats to both internal and external conditions.

10.46.2 Description

SWOT analysis is used to identify the overall state of an organization both internally and externally.

The language used in a SWOT analysis is brief, specific, realistic, and supported by evidence. SWOT analysis serves as an evaluation of an organization against identified success factors. SWOT can be performed at any scale from the

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enterprise as a whole to a division, a business unit, a project, or even an individual. By performing SWOT in a disciplined way, stakeholders can have a clearer understanding of the impact of an existing set of conditions on a future set of conditions.

A SWOT analysis can be used to:

- evaluate an organization's current environment,
- share information learned with stakeholders,
- identify the best possible options to meet an organization's needs,
- identify potential barriers to success and create action plans to overcome barriers,
- adjust and redefine plans throughout a project as new needs arise,
- identify areas of strength that will assist an organization in implementing new strategies,
- develop criteria for evaluating project success based on a given set of requirements,
- identify areas of weakness that could undermine project goals, and
- develop strategies to address outstanding threats.

10.46.3 Elements

SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats:

- **Strengths (S)**: anything that the assessed group does well. May include experienced personnel, effective processes, IT systems, customer relationships, or any other internal factor that leads to success.
- **Weaknesses (W)**: actions or functions that the assessed group does poorly or not at all.
- **Opportunities (O)**: external factors of which the assessed group may be able to take advantage. May include new markets, new technology, changes in the competitive marketplace, or other forces.
- **Threats (T)**: external factors that can negatively affect the assessed group. They may include factors such as the entrance into the market of a new competitor, economic downturns, or other forces.

Beginning a SWOT analysis with opportunities and threats sets the context to identify strengths and weaknesses.

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Figure 10.46.1: SWOT Matrix

10.46.4 Usage Considerations

.1 Strengths

- Is a valuable tool to aid in understanding the organization, product, process, or stakeholders.
- Enables business analysts to direct the stakeholders' focus to the factors that are important to the business.

.2 Limitations

- The results of a SWOT analysis provide a high-level view; more detailed analysis is often needed.
- Unless a clear context is defined for the SWOT analysis the result may be unfocused and contain factors which are not relevant to the current situation.

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10.47 Use Cases and Scenarios

10.47.1 Purpose

Use cases and scenarios describe how a person or system interacts with the solution being modelled to achieve a goal.

10.47.2 Description

Use cases describe the interactions between the primary actor, the solution, and any secondary actors needed to achieve the primary actor's goal. Use cases are usually triggered by the primary actor, but in some methods may also be triggered by another system or by an external event or timer.

A use case describes the possible outcomes of an attempt to accomplish a particular goal that the solution will support. It details different paths that can be followed by defining primary and alternative flows. The primary or basic flow represents the most direct way to accomplish the goal of the use case. Special circumstances and exceptions that result in a failure to complete the goal of the use case are documented in alternative or exception flows. Use cases are written from the point of view of the actor and avoid describing the internal workings of the solution.

Use case diagrams are a graphical representation of the relationships between actors and one or more use cases supported by the solution.

Some use case approaches distinguish between business use cases and system use cases, with business use cases describing how actors interact with a particular process or business function, and system use cases describing the interaction between an actor and a software application.

A scenario describes just one way that an actor can accomplish a particular goal. Scenarios are written as a series of steps performed by actors or by the solution that enable an actor to achieve a goal. A use case describes several scenarios.

10.47.3 Elements

There is no fixed, universal format for use cases. The following elements are frequently captured in a use case description.

.1 Use Case Diagram

A use case diagram visually depicts the scope of the solution, by showing the actors who interact with the solution, which use cases they interact with, and any relationships between the use cases. Unified Modelling Language™ (UML®) describes the standard notation for a use case diagram.

Relationships

Relationships between actors and use cases are called associations. An association line indicates that an actor has access to the functionality represented by the use

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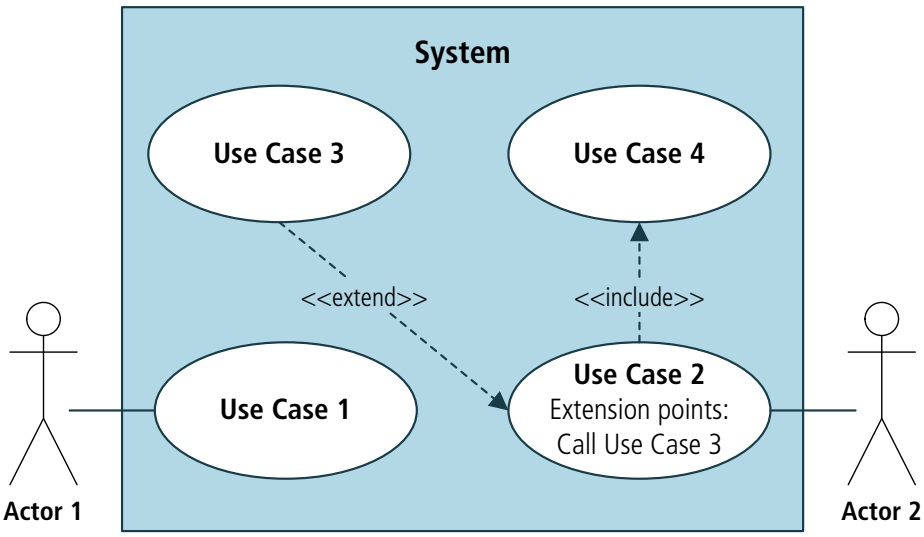
case. Associations do not represent input, output, time, or dependency.

There are two commonly used relationships between use cases:

- **Extend**: allows for the insertion of additional behavior into a use case. The use case that is being extended must be completely functional in its own right and must not depend on the extending use case for its successful execution. This relationship may be used to show that an alternate flow has been added to an existing use case (representing new requirements).
- **Include**: allows for the use case to make use of functionality present in another use case. The included use case does not need to be a complete use case in its own right if it is not directly triggered by an actor. This relationship is most often used either when some shared functionality is required by several use cases or to abstract out a complex piece of logic.

Figure 10.47.1: Use Case Diagram



.2 Use Case Description

Name

The use case has a unique name. The name generally includes a verb that describes the action taken by the actor and a noun that describes either what is being done or the target of the action.

Goal

The goal is a brief description of a successful outcome of the use case from the perspective of the primary actor. This acts as a summary of the use case.

Actors

An actor is any person or system external to the solution that interacts with that solution. Each actor is given a unique name that represents the role they play in interactions with the solution. Some use case authoring approaches recommend

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against the use of systems or events as actors.

A use case is started by an actor, referred to as the primary actor for that use case. Other actors who participate in the use case in a supporting role are called secondary actors.

Preconditions

A precondition is any fact that must be true before the use case can begin. The precondition is not tested in the use case but acts as a constraint on its execution.

Trigger

A trigger is an event that initiates the flow of events for a use case. The most common trigger is an action taken by the primary actor.

A temporal event (for example, time) can initiate a use case. This is commonly used to trigger a use case that must be executed based on the time of day or a specific calendar date, such as an end-of-day routine or an end-of-month reconciliation of a system.

Flow of Events

The flow of events is the set of steps performed by the actor and the solution during the execution of the use case. Most use case descriptions separate out a basic, primary, or main success flow that represents the shortest or simplest successful path that accomplishes the goal of the actor.

Use cases may also include alternative and exception flows. Alternative flows describe other paths that may be followed to allow the actor to successfully achieve the goal of the use case. Exception flows describe the desired response by the solution when the goal is unachievable and the use case cannot be successfully completed.

Post-conditions or Guarantees

A post-condition is any fact that must be true when the use case is complete. The post-conditions must be true for all possible flows through the use case, including both the primary and alternative flows. The use case may describe separate post-conditions that are true for successful and unsuccessful executions of the use case. These can be called guarantees; the success guarantee describes the post-conditions for success. Minimal guarantees describe the conditions that are required to be true, even if the actor's goal is not achieved, and may address concerns such as security requirements or data integrity.

10.47.4 Usage Considerations

.1 Strengths

- Use case diagrams can clarify scope and provide a high-level understanding of requirements.

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- Use case descriptions are easily understood by stakeholders due to their narrative flow.
- The inclusion of a desired goal or outcome ensures that the business value of the use case is articulated.
- Use case descriptions articulate the functional behaviour of a system.

.2 Limitations

- The flexibility of the use case description format may lead to information being embedded that would be better captured using other techniques such as user interface interactions, non-functional requirements, and business rules.
- Decisions and the business rules that define them should not be recorded directly in use cases, but managed separately and linked from the appropriate step.
- The flexible format of use cases may result in capturing inappropriate or unnecessary detail in the attempt to show every step or interaction.
- Use cases intentionally do not relate to the design of the solution and as a result, significant effort may be required in development to map use case steps to software architecture.

10.48 User Stories

10.48.1 Purpose

A user story represents a small, concise statement of functionality or quality needed to deliver value to a specific stakeholder.

10.48.2 Description

User stories capture the needs of a specific stakeholder and enable teams to define features of value to a stakeholder using short, simple documentation. They can serve as a basis for identifying needs and allow for the prioritizing, estimating, and planning of solutions. A user story is typically a sentence or two that describes who has the need addressed by the story, the goal the user is trying to accomplish, and any additional information that may be critical to understanding the scope of the story. With a focus on stakeholder value, user stories invite exploration of the requirements by promoting additional conversations with stakeholders and grouping functional requirements for delivery.

User stories can be used:

- to capture stakeholder needs and prioritize development of solutions,
- as a basis of estimating and planning solution delivery,
- as a basis for generating user acceptance tests,

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- as a metric for measuring the delivery of value,
- as a unit for tracing related requirements,
- as a basis for additional analysis, and
- as a unit of project management and reporting.

10.48.3 Elements

.1 Title (optional)

The title of the story describes an activity the stakeholder wants to carry out with the system. Typically, it is an active-verb goal phrase similar to the way use cases are titled.

.2 Statement of Value

There is no mandatory structure for user stories.

The most popular format includes three components:

- **Who**: a user role or persona.
- **What**: a necessary action, behaviour, feature, or quality.
- **Why**: the benefit or value received by the user when the story is implemented.

For example, "As a <who>, I need to <what>, so that <why>."
"Given...When...Then" is another common format.

.3 Conversation

User stories help teams to explore and understand the feature described in the story and the value it will deliver to the stakeholder. The story itself doesn't capture everything there is to know about the stakeholder need and the information in the story is supplemented by further modelling as the story is delivered.

.4 Acceptance Criteria

A user story may be supported through the development of detailed acceptance criteria (see Acceptance and Evaluation Criteria (p. 217)). Acceptance criteria define the boundaries of a user story and help the team to understand what the solution needs to provide in order to deliver value for the stakeholders. Acceptance criteria may be supplemented with other analysis models as needed.

10.48.4 Usage Considerations

.1 Strengths

- Easily understandable by stakeholders.
- Can be developed through a variety of elicitation techniques.

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- Focuses on value to stakeholders.
- A shared understanding of the business domain is enhanced through collaboration on defining and exploring user stories.
- Tied to small, implementable, and testable slices of functionality, which facilitates rapid delivery and frequent customer feedback.

.2 Limitations

In general, user stories are intended as a tool for short-term capture and prioritization of requirements and not for long-term knowledge retention or to provide a detailed analysis. Neglecting this principle can lead to the following issues:

- This conversational approach can challenge the team since they do not have all the answers and detailed specifications upfront.
- Requires context and visibility; the team can lose sight of the big picture if stories are not traced back through validation or supplemented with higher-level analysis and visual artifacts.
- May not provide enough documentation to meet the need for governance, a baseline for future work, or stakeholder expectations. Additional documentation may be required.

10.49 Vendor Assessment

10.49.1 Purpose

A vendor assessment assesses the ability of a vendor to meet commitments regarding the delivery and the consistent provision of a product or service.

10.49.2 Description

When solutions are in part provided by external vendors (who may be involved in design, construction, implementation, or maintenance of the solution or solution components), or when the solution is outsourced, there may be specific requirements in regard to the involvement of a third party. There may be a need to ensure that the supplier is financially secure, capable of maintaining specific staffing levels, compliant with standards, and able to commit appropriate skilled staff to support the solution. Non-functional requirements can be used to define the service levels expected of a third party, due diligence may be conducted, or certification from an independent authority may be requested.

A vendor assessment is conducted to ensure that the vendor is reliable and that the product and service meet the organization's expectations and requirements. The assessment may be formal through the submission of a Request for Information (RFI), Request for Quote (RFQ), Request for Tender (RFT), or Request for Proposal (RFP). It may also be very informal through word of mouth and recommendations. The standards of the organization, the complexity of the

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initiative, and the criticality of the solution may influence the level of formality in which vendors are assessed.

10.49.3 Elements

.1 Knowledge and Expertise

A common reason for using third-party vendors is that they can provide knowledge and expertise not available within the organization. It may be desirable to target vendors with expertise in particular methodologies or technologies with the goal of having that expertise transferred to people within the enterprise.

.2 Licensing and Pricing Models

The licensing or pricing model is taken into account in cases where a solution or solution component is purchased from or outsourced to a third party vendor. In many cases, solutions that offer similar functionality may differ greatly in their licensing models, which then requires analysis of different usage scenarios to determine which option will provide the best cost-benefit ratio under the scenarios likely to be encountered in the enterprise.

.3 Vendor Market Position

It is important to be able to compare each vendor with the competitors and decide with which market players the organization wants to get involved. The comparison of the organization's profile with each vendor's customer community may also be a factor in the assessment. The dynamics of the vendors' market position are also very important, especially if the organization intends to establish a long-term partnership with that vendor.

.4 Terms and Conditions

Terms and conditions refer to the continuity and integrity of the provided products and services. The organization investigates whether the vendor's licensing terms, intellectual property rights and technology infrastructure are likely to turn into challenges if the organization later chooses to transition to another supplier. There may also be considerations regarding the vendor's use of, and responsibility for protecting, the organization's confidential data. The terms under which customizations of the product will be executed, as well as the availability of a regular update schedule and roadmap of features that are planned for delivery, are considered.

.5 Vendor Experience, Reputation, and Stability

Vendors' experience with other customers may provide valuable information on how likely it is that they will be able to meet their contractual and non-contractual obligations. Vendors can also be evaluated for conformance and compliance with external relevant standards for quality, security, and professionalism. It may be necessary to request that steps be taken to ensure there are no risks if a vendor encounters financial difficulties, and that it will be

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possible to maintain and enhance the solution even if the vendor's situation changes radically.

10.49.4 Usage Considerations

.1 Strengths

- Increases the chances of the organization to develop a productive and fair relationship with a suitable and reliable vendor, and to improve long-term satisfaction with the decision.

.2 Limitations

- May be consuming in regards to time and resources.
- Does not prevent risk of failure as the partnership evolves.
- Subjectivity may bias the evaluation outcome.

10.50 Workshops

10.50.1 Purpose

Workshops bring stakeholders together in order to collaborate on achieving a predefined goal.

10.50.2 Description

A workshop is a focused event attended by key stakeholders and subject matter experts (SMEs) for a concentrated period of time. A workshop may be held for different purposes including planning, analysis, design, scoping, requirements elicitation, modelling, or any combination of these. A workshop may be used to generate ideas for new features or products, to reach consensus on a topic, or to review requirements or designs.

Workshops generally include:

- a representative group of stakeholders,
- a defined goal,
- interactive and collaborative work,
- a defined work product, and
- a facilitator.

Workshops can promote trust, mutual understanding, and strong communication among the stakeholders and produce deliverables that structure and guide future work efforts.

The workshop is ideally facilitated by an experienced, neutral facilitator; however, a team member may also serve as the facilitator. A scribe documents the decisions

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reached and any outstanding issues. A business analyst may be the facilitator or the scribe in these workshops. In situations where the business analyst is a subject matter expert on the topic, they may serve as a workshop participant. This must be approached with caution as it can confuse others as to the role of the business analyst.

10.50.3 Elements

.1 Prepare for the Workshop

When preparing for a workshop, business analysts:

- define the purpose and desired outcomes,
- identify key stakeholders to participate,
- identify the facilitator and scribe,
- create the agenda,
- determine how the outputs will be captured,
- schedule the session and invite the participants,
- arrange room logistics and equipment,
- send the agenda and other materials in advance to prepare the attendees and increase productivity at the meeting, and
- if appropriate, conduct pre-workshop interviews with participants.

.2 Workshop Roles

There are several roles involved in a successful workshop:

- **Sponsor**: frequently not a participant in the workshop, but does have ultimate accountability for its outcome.
- **Facilitator**: establishes a professional and objective tone for the workshop, introduces the goals and agenda for the workshop, enforces structure and ground rules, keeps activities focused on the purpose and desired outcomes, facilitates decision making and conflict resolution, and ensures that all participants have an opportunity to be heard.
- **Scribe**: documents the decisions in the format determined prior to the workshop and keeps track of any items or issues that are deferred during the session.
- **Timekeeper**: may be used to keep track of the time spent on each agenda item.
- **Participants**: includes key stakeholders and subject matter experts. They are responsible for providing their input and views, listening to other views, and discussing the issues without bias.

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.3 Conduct the Workshop

To ensure that all participants have a common understanding, facilitators generally begin the workshop with a statement of its purpose and desired outcomes. Some workshops may also start with an easy or fun task to break the ice and get the participants comfortable working together.

Establishing agreed-upon ground rules can be an effective method for establishing a productive environment for collaboration. Ground rules can include:

- respect the opinions of others,
- everyone is expected to contribute,
- discussion that is off-topic should be limited to a specific set time,
- discuss the issues, not the people, and
- an agreement on how decisions are made.

Throughout the workshop, the facilitator maintains focus by frequently validating the session's activities with the workshop's purpose and outcomes.

.4 Post Workshop Wrap-up

After the workshop, the facilitator follows up on any open action items that were recorded at the workshop, completes the documentation, and distributes it to the workshop attendees and any stakeholders who need to be kept informed of the work done.

10.50.4 Usage Considerations

.1 Strengths

- Can be a means to achieve agreement in a relatively short period of time.
- Provides a means for stakeholders to collaborate, make decisions, and gain a mutual understanding.
- Costs are often lower than the cost of performing multiple interviews.
- Feedback on the issues or decisions can be provided immediately by the participants.

.2 Limitations

- Stakeholder availability may make it difficult to schedule the workshop.
- The success of the workshop is highly dependent on the expertise of the facilitator and knowledge of the participants.
- Workshops that involve too many participants can slow down the workshop process. Conversely, collecting input from too few participants can lead to the overlooking of needs or issues that are important to some stakeholders, or to

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the arrival at decisions that don't represent the needs of the majority of the stakeholders.

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11 Perspectives

Perspectives are used within business analysis work to provide focus to tasks and techniques specific to the context of the initiative. Most initiatives are likely to engage one or more perspectives. The perspectives included in the *BABOK® Guide* are:

- Agile,
- Business Intelligence,
- Information Technology,
- Business Architecture, and
- Business Process Management.

These perspectives do not presume to represent all the possible perspectives from which business analysis is practiced. The perspectives discussed in the *BABOK® Guide* represent some of the most common views of business analysis at the time of writing.

Any given initiative includes one, many, or all of these perspectives. For example, an initiative may have a technology component (Information Technology Perspective), the technology component may mean business process changes (Business Process Management Perspective), the initiative may decide to do part, or all of the work with an agile approach (Agile Perspective). Another initiative may merge two organizations and need to look at the business capabilities and how the transformation impacts those capabilities (Business Architecture Perspective), and the business leaders need updated information for decision making and analysis (Business Intelligence Perspective). Large or complex initiatives will likely employ all perspectives.

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While the business analysis tasks detailed in the *BABOK® Guide* are intended to be applicable across all areas of business analysis, they are also pertinent to each specific business analysis perspective. Perspectives provide ways to approach business analysis work in a more focused manner suitable to the context. The perspectives help interpret and understand the knowledge areas and tasks in the *BABOK® Guide* from the lens in which one is currently working.

Each perspective follows a common structure:

- Change Scope,
- Business Analysis Scope,
- Methodologies, Approaches, and Techniques,
- Underlying Competencies, and
- Impact on Knowledge Areas.

11.1 The Agile Perspective

The Agile Perspective highlights the unique characteristics of business analysis when practiced in the context of agile environments.

Agile is about having a flexible mindset, embodied in a set of values and principles and exhibited by a variety of complementary practices. Agile initiatives involve constant change. Business analysts working on agile initiatives continually reassess, adapt, and adjust their efforts and tactics. Business analysts conduct analysis and deliver work products at the last responsible moment to continually allow flexibility for change; detailed analysis work is not done ahead of time, but just in time to be effectively utilized by the agile team.

Agile business analysis ensures that information is available to the agile team at the right level of detail at the right time. Business analysts help agile teams answer these questions:

- What need are we trying to satisfy?
- Is that need worth satisfying?
- Should we deliver something to satisfy that need?
- What is the right thing to do to deliver that need?

Business analysis work is performed continuously throughout an agile initiative and relies heavily on interpersonal skills such as communication, facilitation, coaching, and negotiation. Business analysts are active members of an agile team and often facilitate planning, analyzing, testing, and demonstrating activities. In an agile team, business analysis may be performed by a product manager/owner, business analyst, or by other defined team roles. Business analysts help the team identify modifications in assumptions and other project variations that emerge.

Refer to the *Agile Extension to the BABOK® Guide* for an expanded treatment of the role, mindset, and practices of business analysis in agile approaches, as well as details on the values and principles of the Agile Manifesto (www.agilemanifesto.org).

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11.1.1 Change Scope

Business analysts working on agile initiatives engage with the business sponsor on a strategic level and assist with defining how the proposed product or feature aligns with the organization's objectives. They collaborate with various stakeholders and the change team to break the product vision down into a prioritized list of desired work items to be completed. The prioritized items (or prioritized backlog list) usually focus on the capabilities needed in the resultant product, with emphasis on the highest value items first.

Business analysts may act as a stakeholder proxy, or work directly with the sponsor or product owner.

In agile environments, change and rapid response to change is expected. Agile teams deliver small, incremental changes and commit to prioritized work items for only one iteration at a time. This allows the agile team to handle emerging changes for the upcoming iteration with minimal impact. An iteration is an agreed period of work time.

Requirements are developed through continual exploration and analysis of the business needs. It is important to note that though most agile approaches are iterative, not all iterative approaches are agile. There are also several agile approaches that are not iterative, such as the kanban method.

During agile initiatives, scope is constantly evolving. This is managed by the backlog list which is continually reviewed and re-prioritized. This process contributes to the refinement and redefinition of scope in order to meet the evolving and emerging business need.

If a major change emerges that significantly impacts the overall value and goals for the project, the project can be adjourned and reassessed.

.1 Breadth of Change

Agile approaches are used to address a variety of needs in an enterprise. The most common use of agile practices is in software development projects. However, many organizations have started to apply agile principles to non-software related change such as process engineering and business improvement. Initiatives using agile approaches can be undertaken within a single department or can span across multiple teams, departments, and divisions of an organization.

For organizations new to the agile mindset and practices, a focus on continuous improvement, ongoing changing behaviour, and making progress enables the organization to move towards culturally adopting the agile mindset. Adopting the agile mindset refers to the cultural adoption of agile principles as opposed to the organization considering agile as a methodology or practice to be implemented.

.2 Depth of Change

Initiatives using an agile approach are frequently part of a larger program of work, which can include organizational transformation and change, business process re-engineering, or business process change. The agile work stream is frequently, but not always, centered on software development. The other

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elements of the program can be developed using agile or another methodology that is appropriate for the need. Agile principles and practices are often successfully applied in initiatives where:

- there is a clear commitment from the customer and engagement by empowered subject matter experts (SMEs),
- the business need or proposed solution is complex or complicated, and
- business needs are changing or unknown and are still emerging.

Agile approaches can be used for initiatives that are developing a solution for the first time, or for maintaining and enhancing an existing solution. For example, if the change is mission critical then processes can be added to address regulatory requirements and to deal with the mission critical aspects of the project.

.3 Value and Solutions Delivered

The value and solutions delivered in an agile initiative are similar to any other initiative. The difference with an agile approach is the emphasis on delivering value early in a highly collaborative manner, using adaptive planning that has a focus on continuous improvement.

An agile initiative provides value by virtue of the approach taken by an agile team through ongoing review and feedback of the work performed. Stakeholders get the opportunity to frequently review the product, which allows them to identify any missed requirements early. The solution evolves over time with an expectation of rapid and flexible response to change. Clarity and visibility of all communications is of the utmost importance to ensure the agile team's efforts align with the organization's needs and expectations.

In a new team, the business analyst often plays a central role in building rapport and trust amongst the agile team members and external stakeholders to help enable ongoing collaborative discussions and engagement. This interaction enables the agile team to accurately deliver value that meets evolving stakeholder needs.

.4 Delivery Approach

Agile approaches focus on people interactions, transparent communications, and ongoing delivery of valuable change to stakeholders.

Each agile approach has its own unique set of characteristics that allows teams to select an approach that best suits the initiative at hand. Some agile teams have found that a hybrid or combination of approaches is necessary to work within the constraints of their environment.

Refer to the *Agile Extension to the BABOK® Guide* for a description of different agile delivery approaches.

.5 Major Assumptions

The assumptions in place in agile environments frequently include:

- Changing requirements are welcome, even late in development.

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- The business problem can be reduced to a set of needs that can be met using some combination of technology and business process change.
- Agile initiatives have fully engaged customers and empowered SMEs with complete buy-in to the agile approach.
- Ideally, team membership is constant and members are not continually being moved to other teams.
- There is a preference for multidisciplinary and co-located teams encouraging more efficient and effective face-to-face conversation. However, agile approaches can work well with distributed teams provided appropriate support and communication channels are in place.
- Team members may perform more than one role within the team if it is required, and provided that the team has the appropriate skills (for example, cross-functional teams).
- Team members have a mindset for continuous improvement and successful value delivery through regular inspection.
- Agile teams are empowered and self-organizing.

11.1.2 Business Analysis Scope

.1 Change Sponsor

It is important that a sponsor of an agile initiative be familiar with the agile philosophy, mindset, and approaches, and also be open to the constant feedback that will require trade-offs from the stakeholders.

An agile sponsor understands and accepts the:

- use of adaptive planning over predictive planning,
- use and value of a fixed period of time for a work cycle, and
- need and value of the sponsor's involvement.

The sponsor's (or empowered SME's) active involvement with the agile team is critical to providing the sponsor with the ability to preview and understand the product being developed, as well as allowing an opportunity for the sponsor to provide continuous feedback to the team and adjust the product as needs change.

.2 Change Targets and Agents

Agile approaches are most successful when the organizational culture and working environments lend themselves to intensive collaboration, frequent communication, and a strong disposition towards incremental delivery of appropriate solution value.

Agile teams are frequently either small or around teams of small teams. The simpler and flatter structure doesn't change the fact that the deliverables may affect a large group of stakeholders. The change agent, also considered a

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stakeholder, is not different because the project uses agile. The primary agents for a change using an agile approach can include:

- **Agile team leader**: the facilitator of the work of the team. An agile team leader frequently shares the same soft skill set of a project manager, but completely delegates the tasks of planning, scheduling, and prioritization to the team. Rather than traditional command-and-control management, servant leadership is preferred in all the agile approaches. Depending on the approach, this role may be called scrum master, iteration manager, team leader, or coach.
- **Customer representative or product owner**: the active team member responsible for ensuring that the change being developed addresses the requirements for which it has been mandated. In Scrum this role is called the product owner. The dynamic systems development method (DSDM) refers to this role as that of a visionary, and extreme programming (XP) refers to it as a customer representative.
- **Team members**: the specialists or domain experts that include both technical and customer representation. Depending on size and particular context of the initiative, individuals within a team have different specialties. Usability experts, technical architects, and database administrators are just a sample of such specialized roles that provide support to the team as needed.
- **External stakeholders**: all of the remaining stakeholders who may not be considered team members, but are an interested party in the outcome of the project or simply required for its completion, playing what can be considered a supporting role in the team.

.3 Business Analyst Position

An agile team may have one or more team members with business analysis skills who may or may not have the job title of business analyst. This recognition of cross-skilled team members expands the practice of business analysis beyond that of a single specialist role.

On agile teams, business analysis activities can be performed by one or a combination of:

- a business analyst working on the team,
- the customer representative or product owner, or
- distributing these activities throughout the team.

Refer to the *Agile Extension to the BABOK® Guide* for more details.

.4 Business Analysis Outcomes

In an agile environment, business analysis brings people together and ensures that the right stakeholders are involved with the agile team at the right time. Open communication and collaboration is one of the principal outcomes of successful business analysis in an agile project.

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Business analysts ensure that the project's vision and direction are in strategic alignment to the organizational goals and business need. The business analyst holds shared responsibility in defining strategic criteria for project completion and during the project assists with defining acceptance criteria. They also facilitate the articulation of the product vision statement. The product vision statement is a common initial deliverable.

Documentation rigour and style is highly dependent on the purpose and the context in which it is produced. Agile approaches favour just enough and just-in-time documentation rather than establishing predefined models for documentation to be delivered. This documentation approach allows for the documents to incorporate as much of the change introduced as possible while keeping the cost of change low. Mandatory documentation, such as that required for auditing or compliance reporting, are still produced as part of each delivery cycle. It is important that documents address an identified need and deliver more value than the cost incurred to produce and maintain them.

11.1.3 Approaches and Techniques

.1 Approaches

Agile is an umbrella term for a variety of approaches. All agile approaches practice business analysis but only a few explicitly define the business analysis role. The primary characteristic of any agile approach is its alignment to the values and principles of the Agile Manifesto. An agile team may implement or evolve to use a combination of approaches which enables them to deliver value more effectively given their project type and work environment.

Table 11.1.1: Agile Approaches

Approach	Brief description
Crystal Clear	Part of a family of Crystal methodologies which are defined based on hardness and colour. The hardness refers to the business criticality or potential for causing harm, which amounts to more rigour and predictive planning being required as the criticality increases. Colour refers to the heaviness of the project across a number of dimensions including number of people required and risk elements in the project.
Disciplined Agile Delivery (DAD)	A decision process framework which incorporates ideas from a variety of other agile approaches. It is intended to support a project from initiation through delivery. DAD is not prescriptive and allows for teams to customize their own life cycles and approaches.

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Table 11.1.1: Agile Approaches (Continued)

Approach	Brief description
Dynamic Systems Development Method (DSDM)	A project delivery framework which focuses on fixing cost, quality, and time at the beginning while contingency is managed by varying the features to be delivered. MoSCoW prioritization technique is used for scope management. Time boxes, or short focused periods of time with clearly defined outcomes, are used to manage the work.
Evolutionary Project Management (Evo)	A project management method for developing and delivering a system incrementally. It has a strong focus on quantifying value for multiple stakeholders and planning increments based on delivery of that value (which can be measured). It uses impact estimation tables as a formal technique for assessing solutions for their ability to deliver value to multiple stakeholders for a given cost.
Extreme Programming (XP)	Named for the concept of taking beneficial software engineering techniques to the extreme. This concept focuses on the technical development processes and features pair-programming, test-driven development, and other craftsmanship approaches to the technical practices. XP technical practices are often used in conjunction with one of the agile management frameworks.
Feature Driven Development (FDD)	Focuses on a client valued functionality perspective to develop working software. For example, following a high-level scoping exercise, a feature list is identified and all planning, design, and development are performed based on feature sets.
Kanban	Does not require fixed iterations. Work moves through the development process as a continuous flow of activity. A key feature is to limit the amount of work underway at any one time (referred to as the work in progress limit or WIP). The team works only on a fixed number of items at any one time and work may begin on a new item only when it is required to maintain flow downstream and after the previous item has been completed.
Scaled Agile Framework® (SAFe™)	A framework for implementing agile practices at enterprise scale. It highlights the individual roles, teams, activities and artifacts necessary to scale agile from the team to program to the enterprise level.
Scrum	A lightweight process management framework based on empirical process control. Work is performed in a series of fixed length iterations, called Sprints, which last one month or less. At the end of each sprint the team must produce working software of a high enough quality that it could potentially be shipped or otherwise delivered to a customer.

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.2 Techniques

The following table lists techniques commonly used within agile approaches. Refer to the *Agile Extension to the BABOK® Guide* for a more detailed description of these techniques.

Table 11.1.2: Techniques used within Agile Approaches

Technique	Brief Description
Behaviour Driven Development (BDD)	An approach that enhances the communication between stakeholders and team members by expressing product needs as concrete examples.
Kano Analysis	A technique for understanding which product features will help drive customer satisfaction.
Lightweight Documentation	A principle that governs all documentation produced on an agile project. The purpose is to ensure that all documentation is intended to fulfill an impending need, has clear value for stakeholders, and does not create unnecessary overhead. For example, a system overview document may be written towards the end of a project based on stable content and acceptance tests written as part of the product testing.
MoSCoW Prioritization	A method to prioritize stories (or other elements) in incremental and iterative approaches. MoSCoW (must have, should have, could have, won't have) provides a way to reach a common understanding on relative importance of delivering a story or other piece of value in the product.
Personas	Fictional characters or archetypes that exemplify the way that typical users interact with a product.
Planning Workshop	A collaborative workshop that is used to allow an agile team to determine what value can be delivered over a time period such as a release.
Purpose Alignment Model	A model that is used to assess ideas in the context of customer and value.
Real Options	An approach to help people know when to make decisions rather than how.
Relative Estimation	Team estimation techniques using either story points, which represent the relative complexity of a user story to develop, or ideal days, which represent the amount of total effort a story would take to develop.
Retrospectives	A similar term for the Lesson Learned technique. Retrospectives focus on continuous improvement of the teamwork process and are held after every iteration on agile projects.

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Table 11.1.2: Techniques used within Agile Approaches (Continued)

Technique	Brief Description
Story Decomposition	Ensures that the requirements for a product are represented at the appropriate level of detail and are derived from a valuable business objective.
Story Mapping	Provides a visual and physical view of the sequence of activities to be supported by a solution.
Storyboarding	Detail visually and textually the sequence of activities that represent user interactions with a system or business.
Value Stream Mapping	Provides a complete, fact-based, time-series representation of the stream of activities required to deliver a product or service to the customer.

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11.1.4 Underlying Competencies

Agile is a mindset. Agile business analysts embody the values and principles of the Agile Manifesto which are based on a humanistic view of product development as a process founded in communication and collaboration. Refer to the *Agile Extension to the BABOK® Guide* for a description of the principles for business analysts. In adopting the agile mindset and philosophy, the business analyst develops competencies in:

- **Communication and collaboration**: the ability to communicate the sponsor's vision and needs; assist in influencing others to support the vision; participate and possibly facilitate negotiation of priorities; and facilitate collaborative agreement on solution outcomes.
- **Patience and tolerance**: the ability to maintain self-control under pressure and keep an open mind when interacting with others.
- **Flexibility and adaptability**: cross-functional skill sets that allow the business analyst to step outside their specialization in order to support other team members.
- **Ability to handle change**: the ability to quickly assess the impact of change and determine what provides business value amongst frequently changing requirements, and assisting with, or maintaining, the re-prioritization of the to-do work list.
- **Ability to recognize business value**: the ability to understand how changes and new features can achieve business value and support the vision.
- **Continuous improvement**: periodically review with the agile team how to become more effective.

11.1.5 Impact on Knowledge Areas

This section explains how specific business analysis practices within agile are mapped to business analysis tasks and practices as defined by the *BABOK® Guide*. It also describes how each knowledge area is applied or modified with the agile discipline.

Each knowledge area lists techniques relevant to an agile perspective. *BABOK® Guide* techniques are found in the Techniques chapter of the *BABOK® Guide*. Agile Extension techniques are discussed in detail in the *Agile Extension to the BABOK® Guide*. This is not intended to be an exhaustive list of techniques but rather to highlight the types of techniques used by business analysts while performing the tasks within the knowledge area.

.1 Business Analysis Planning and Monitoring

In agile approaches, detailed business analysis planning can be deferred until work on an activity is ready to begin rather than done upfront as in predictive projects.

An initial plan for business analysis activities is developed at the beginning of the project. The plan then gets updated prior to the start of each cycle to account for change and to ensure that the plan is always up to date. Stakeholder involvement and engagement is key to the success of agile projects. Business analysts proactively plan to involve, engage, and collaborate with stakeholders. Communication is commonly much less formal and business analysis deliverables are often interactions and collaboration with less emphasis on the written documents.

BABOK® Guide Techniques

- Backlog Management (p. 220)
- Collaborative Games (p. 243)
- Estimation (p. 271)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Mind Mapping (p. 299)
- Prioritization (p. 311)
- Scope Modelling (p. 338)
- Stakeholder List, Map, or Personas (p. 344)
- User Stories (p. 359)
- Workshops (p. 363)

Agile Extension Techniques

- Lightweight Documentation
- MoSCoW Prioritization
- Personas
- Relative Estimation
- Retrospective

.2 Elicitation and Collaboration

Progressive elicitation and elaboration occur throughout an agile initiative. The most common pattern is an initial elicitation activity that establishes the high-level vision and scope of the solution, and an initial milestone-based plan for the delivery of the product. In every cycle there is more detailed elicitation for the

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backlog items that will be developed in that cycle. The intent of elicitation activities is to generate just enough detail to ensure that the work at hand is performed correctly while aiming towards the goals. Agile approaches aim to minimize the time between the elaboration of needs and their implementation in the solution. There is a strong focus on collaborative elicitation approaches such as workshops with stakeholders.

BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Backlog Management (p. 220)
- Brainstorming (p. 227)
- Collaborative Games (p. 243)
- Concept Modelling (p. 245)
- Interface Analysis (p. 287)
- Mind Mapping (p. 299)
- Non-Functional Requirements Analysis (p. 302)
- Process Modelling (p. 318)
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Agile Extension Techniques

- Behaviour Driven Development
- Lightweight Documentation
- Personas
- Storyboarding
- Story Mapping

.3 Requirements Life Cycle Management

As agile initiatives unfold, the scope is defined with increasing specificity. The expectation is that the needs will change and that the design will evolve over the course of the project. Prioritization of features based on value and development priority drives the work done in each cycle. Validation of the evolving solution with the stakeholders occurs at the end of every iteration in place of a formal requirements approval process.

BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Backlog Management (p. 220)
- Collaborative Games (p. 243)
- Prioritization (p. 311)
- Reviews (p. 326)
- Workshops (p. 363)

Agile Extension Techniques

- Kano Analysis
- MoSCoW Prioritization
- Story Decomposition
- Story Mapping

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.4 Strategy Analysis

Agile approaches are often used when there is uncertainty about the needs, the solution, or the scope of change. Strategy analysis is a constant part of an agile initiative to ensure that the solution delivered continues to provide value to stakeholders. Agile team members use strategy analysis to help understand and define product vision, and develop and adjust the development roadmap, in addition to conducting ongoing assessments of related risks. For every iteration, the proposed solution is reassessed against the current business context to ensure that it will effectively meet the business goals. The adaptive nature of agile projects means that adapting the project to changes in the organization's goals is not disruptive; rather, it is an expected part of the process.

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- Backlog Management (p. 220)
- Brainstorming (p. 227)
- Business Capability Analysis (p. 230)
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Agile Extension Techniques

- Kano Analysis
- Personas
- Purpose Alignment Model
- Real Options
- Value Stream Analysis

.5 Requirements Analysis and Design Definition

Needs are progressively elaborated during an agile project. Analysis and design are performed on a just-in-time basis, either just before or during the iteration in which the solution component will be developed.

Analysis performed just before the iteration is to provide the team with enough information to estimate the planned work. Analysis performed during the iteration is to provide the team with enough information to construct or deliver the planned work.

Models and other analysis and design techniques are typically used informally, and may not be maintained once they have served their purposes. The analysis and design approach used should support progressive elaboration, be adaptable to change based on learning, and not cause the team to select solutions prematurely. Agile teams tend to use user stories at the lowest level of decomposition, usually supported by acceptance criteria which capture the analysis and design details regarding how the stories should behave when implemented. Validation of the evolving solution is performed with stakeholders at the end of every iteration.

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- Acceptance and Evaluation Criteria (p. 217)
- Business Capability Analysis (p. 230)
- Business Rules Analysis (p. 240)

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- Collaborative Games (p. 243)
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Agile Extension Techniques

- Behaviour Driven Development
- Kano Analysis
- Lightweight Documentation
- MoSCoW Prioritization
- Purpose Alignment Model
- Real Options
- Story Decomposition
- Story Elaboration
- Story Mapping
- Storyboarding
- Value Stream Analysis

.6 Solution Evaluation

Throughout an agile project, the stakeholders and agile team continually assess and evaluate the development solution as it is incrementally built and refined. Evaluation of the evolving solution with the stakeholders occurs at the end of every development cycle to ensure the deliverable meets their needs and satisfies their expectations. The business analyst ensures that the product meets expectations before a product is released, and identifies new opportunities that will add value to the business.

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Agile Extension Techniques

- Personas
- Value Stream Analysis

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11.2 The Business Intelligence Perspective

The Business Intelligence Perspective highlights the unique characteristics of business analysis when practiced in the context of transforming, integrating, and enhancing data.

The focus of business intelligence is the transformation of data into value-added information: where to source it, how to integrate it, and how to enhance and deliver it as analytic insight to support business decision making.

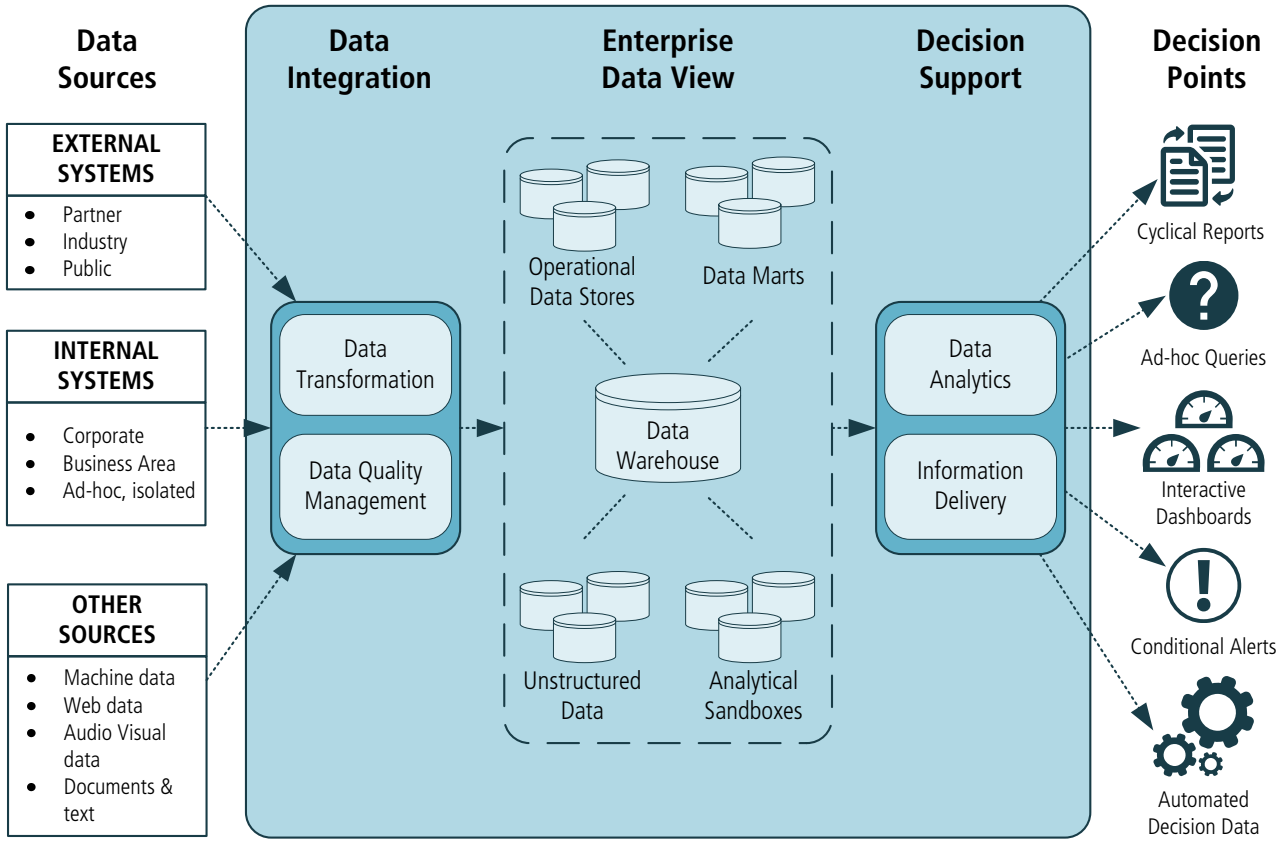
Business intelligence initiatives apply data-centric system architectures as well as technologies and tools to deliver reliable, consistent, high-quality information that enables stakeholders to better manage strategic, tactical, and operational performance.

11.2.1 Change Scope

.1 Breadth of Change

A key objective of a business intelligence system is the consistent definition and usage of information throughout an organization by establishing a 'single point of truth' for diverse business data. A solution architecture that can integrate multiple data sources from within (and potentially from outside) the organization provides the foundation of a business intelligence solution.

Figure 11.2.1: Business Intelligence Solution - Conceptual Framework



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The business intelligence promotes an enterprise-wide view of information management. To support that conceptual framework, a business intelligence initiative may also involve the development of infrastructure services in the organization, such as data governance and metadata management.

.2 Depth of Change

Business intelligence initiatives focus on the information needed to support decision making at, or across, different levels within the organization:

- **executive level**: supports strategic decisions,
- **management level**: supports tactical decisions, or
- **process level**: supports operational decisions.

Where information needs are initially expressed or identified at a particular level, the business analyst investigates the business implications at other levels to assess the overall impact of the change on the organization.

At each level, the business needs may involve any or all of the following:

- communication requirements for the development of new reporting or the replacement of existing reporting,
- information requirements for the addition or extension of analytic functionality, and/or
- data integration requirements for the construction or modification of the enterprise data view with regard to data sources, definitions, transformation rules and quality issues.

.3 Value and Solutions Delivered

The value of a business intelligence initiative is in its ability to provide timely, accurate, high value, and actionable information to those people and systems who can use it effectively in making business decisions.

Better informed decision making at all levels can lead to improved business performance in:

- strategic processes such as market analysis, customer engagement, and product development,
- tactical processes such as stock control and financial planning, and
- operational processes such as credit assessment, fault detection, and accounts payable monitoring.

These improvements in an organization's current and future performance may be realized as increased revenues and reduced costs.

.4 Delivery Approach

A business intelligence solution presents a range of delivery options to meet the emerging information needs of stakeholders and the priorities of the organization.

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The extensibility and scalability of the solution architecture provide for the support of business decision making to be progressively introduced or enhanced:

- at different levels in the organization, from strategic (senior executive), through tactical (management), to operational (staff and systems), and
- in target functional areas in the organization, from a specific area through to an enterprise-wide implementation.

The infrastructure services that provide data management, analytics, and presentation capabilities, facilitate a phased or incremental development strategy in respect of:

- the inclusion, coordination and control of different data sources, and
- the analysis and development of business information and insights.

Infrastructure components of a business intelligence solution are often provided by a commercial off-the-shelf package configured to the specific business environment and needs.

.5 Major Assumptions

The following is a list of major assumptions of a business intelligence initiative:

- existing business processes and transactional systems can provide source data that is definable and predictable,
- the cross-functional data infrastructure that is needed to support a business intelligence solution has not been precluded by the organization on technical, financial, political/cultural, or other grounds, and
- the organization recognizes that process re-engineering and change management might be needed in order to effectively realize the value from a business intelligence solution.

11.2.2 Business Analysis Scope

.1 Change Sponsor

The change sponsor of a business intelligence initiative is ideally the highest level role from the organizational unit affected by the change. This provides for a consistent, cohesive approach to the shared usage of data assets within the cross-functional architecture of a business intelligence solution.

.2 Change Targets

The targets of a business intelligence initiative are the business decisions made by people or processes at multiple levels in the organization that can be improved by better reporting, monitoring, or predictive modelling of performance-related data.

.3 Business Analyst Position

As in other initiatives, the business analyst acts as the primary liaison between business intelligence stakeholders and solution providers in the elicitation,

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analysis, and specification of business needs.

In addition to that role, the business analyst may also participate in technical activities that are specific to business intelligence, including:

- enterprise data modelling,
- decision modelling,
- specialized presentation design (for example, dashboards), and
- ad hoc query design.

A business analyst working on a business intelligence initiative serves in one or in a combination of the following roles:

- business analyst who is competent in the definition of business requirements and the assessment of potential solutions,
- business intelligence functional analyst who has an understanding of data mining and predictive analytic techniques, as well as skills in developing visualizations,
- data analyst who is experienced at defining source systems data to be used for the required analytical purposes, or
- data modeller/architect who is skilled in defining the source and target data structures in logical data models.

.4 Business Analysis Outcomes

In the business intelligence discipline, business analysis is focused on the major components of the solution architecture:

- the specification of business decisions to be influenced or changed,
- the collection of data from source systems,
- the integration of divergent sources into a convergent enterprise framework, and
- the provision of targeted information and analytic insight to business stakeholders.

The business analyst is responsible for the analysis and specification of the business requirements for all of these components and collaborates with technical specialists to assess solution artifacts.

The major outcomes of business analysis are:

- **Business process coverage**: defines the scope of the change with a high-level overview of the business decisions within the enterprise that are to be supported by the solution. It identifies how the information output will be used and what value it will provide.
- **Decision models**: identify the information requirements of each business decision to be supported and specify the business rules logic of how the individual information components contribute to the decision outcome.
- **Source logical data model and data dictionary**: the source logical data model provides a standard definition of the required data as held in each

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source system. The source data dictionary provides a definition of each element and the business rules applied to it: business description, type, format and length, legal values, and any inter-dependencies.

- **Source data quality assessment**: evaluates the completeness, validity, and reliability of the data from source systems. It identifies where further verification and enhancement of source data is required to ensure consistent business definitions and rules apply across the enterprise-wide data asset.
- **Target logical data model and data dictionary**: the target logical data model presents an integrated, normalized view of the data structures required to support the business domain. The target data dictionary provides the standardized enterprise-wide definition of data elements and integrity rules.
- **Transformation rules**: map source and target data elements to specify requirements for the decoding/encoding of values and for data correction (error values) and enrichment (missing values) in the transformation process.
- **Business analytics requirements**: define the information and communication requirements for decision support outputs. These include:
  - predefined reports,
  - dashboards,
  - balanced scorecards,
  - ad hoc reports,
  - online analytical processing (OLAP) queries,
  - data mining,
  - prescriptive analytics,
  - conditional alerts,
  - complex event processing, and
  - predictive modelling.
- Specifications for each output can include: (1) data selections/dimensions, level of granularity, filtering criterion applied, possibilities for drill down, slice and dice, and user access and permissions; and (2) presentation rules to define data element format, translation (labels, look-ups), calculations, and data aggregations.
- **Solution architecture**: provides a high-level design view of how the decision support requirements of each functional area will map to the business intelligence framework. It is typically presented in the form of a process (or data flow) model that defines:
  - where the source data is held,
  - how (pull/push) and when (frequency, latency) the data will be extracted,

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- where the transformations will take place (cleansing, encoding, enhancement),
- where the data will be physically stored (data warehouse, data marts), and
- how the data will flow to presentation outputs (reporting facilities, query tools).

11.2.3 Methodologies and Approaches

.1 Methodologies

There are no formalized business intelligence methodologies that impact the responsibilities and activities of the business analyst. However, a business intelligence initiative can operate within or alongside methodologies applicable to other disciplines or perspectives which themselves might impact the business analysis role.

.2 Approaches

Within the business intelligence framework there are a number of less formal and potentially overlapping approaches that map to particular business and technical contexts.

Types of Analytics

There are three types of data analytics that represent incremental solutions, with increasing levels of systems complexity, cost, and value:

- **Descriptive analytics**: uses historical data to understand and analyze past business performance. Business information can be categorized and consolidated to best suit the stakeholder's view including executive management dashboards, middle level management key performance indicator (KPI) scorecards, and operational level management charts. No assumptions are made as to which situations are of interest to the stakeholders, what decisions need to be made, or what actions might be carried out. The business analysis focus is on the information and communication requirements for standard reporting and dashboards, ad hoc reporting, and query functionality.
- **Predictive analytics**: applies statistical analysis methods to historical data to identify patterns, and then uses that understanding of relationships and trends to make predictions about future events. The particular situations that are of interest to the stakeholders are specified, and their business rules are defined. The business analysis focus is on the information requirements for pattern recognition through data mining, predictive modelling, forecasting, and condition-driven alerts.
- **Prescriptive analytics**: expands on predictive analytics to identify decisions to be made and to initiate appropriate action to improve business performance. Statistical optimization and simulation techniques can be

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used to determine the best solution or outcome among various choices. For situations of interest to stakeholders, full specification of the associated decisions and potential actions are required. The business analysis focus is on the business objectives, constraints criteria, and the business rules that underpin the decision-making process.

Supply and Demand Driven

The objectives and priorities of a business intelligence initiative can be based on the technical goals of improving existing information delivery systems (supply-driven) or on the business goals of providing the appropriate information to improve decision-making processes (demand-driven):

- **Supply-driven**: assumes the view of "for a given cost, what value can we deliver?". This approach maps existing systems data to define what data is available. A common implementation strategy would be to:
  1. phase the inclusion of existing databases into the business intelligence solution architecture,
  2. progressively replace or repair existing outputs, and
  3. explore new insights that might be gained from the consolidated data.
- **Demand-driven**: assumes the view of "for a given value, what cost do we incur?". This approach starts with identifying the information output needed to support business decisions, and then tracing that information back to the underlying data sources to determine feasibility and cost. It provides for incremental implementation strategies that are not determined by existing database structures, and allows for early exploratory usage of business intelligence beyond existing reporting requirements.

Structured and Unstructured Data

There are two types of data that business intelligence approaches consider:

- **Structured data**: traditional data warehouse solutions have been based on consolidating the structured data (numerical and categorical) recorded in operational systems where business information sets are identified by predefined structures (referred to as 'schema on write') and where a rules-driven template ensures data integrity. The business analysis focus is on data models, data dictionaries, and business rules to define information requirements and capabilities.
- **Unstructured data**: business intelligence solutions can include semi-structured or unstructured data which includes text, images, audio, and video. This data frequently comes from external sources. For this type of data, the structure and relationships are not predefined and no specific organization rules have been applied to ensure data integrity. Information sets are derived from the raw data (referred to as 'schema on read'). The business analysis focus is on metadata definitions and data matching algorithms to define information requirements and capabilities.

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11.2.4 Underlying Competencies

As in any business analysis discipline, the business analyst requires the fundamental communication and analytical competencies to be effective in liaising with both business stakeholders and technical solution providers.

In the business intelligence discipline, this coordination of business information requirements with business intelligence systems outcomes can be further enhanced by the business analyst's specific competencies in:

- business data and functional usage, including terminology and rules,
- the analysis of complex data structures and their translation into standardized format,
- business processes affected including KPIs and metrics,
- decision modelling,
- data analysis techniques including basic statistics, data profiling,and pivoting,
- data warehouse and business intelligence concepts and architecture,
- logical and physical data models,
- ETL (Extract, Transform, Load) best practices including historical data track and reference data management, and
- business intelligence reporting tools.

11.2.5 Impact on Knowledge Areas

This section explains how specific business analysis practices within business intelligence are mapped to business analysis tasks and practices as defined by the *BABOK® Guide*. This section describes how each knowledge area is applied or modified with the business intelligence discipline.

Each knowledge area lists techniques relevant to a business intelligence perspective. Techniques used in the discipline of business intelligence do not deviate, to any great extent, from the *BABOK® Guide* techniques. *BABOK® Guide* techniques are found in the Techniques chapter of the *BABOK® Guide*. This is not intended to be an exhaustive list of techniques but rather to highlight the types of techniques used by business analysts while performing the tasks within the knowledge area.

.1 Business Analysis Planning and Monitoring

A business intelligence initiative may require establishing an underlying data infrastructure to support the solution, or it might be an enhancement based on the infrastructure of an existing solution. Scope Modelling is frequently used to differentiate between these alternatives and plan the relevant business analysis activities accordingly.

The business intelligence paradigm of information delivery might be a new,

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unfamiliar approach for business stakeholders and for the business analysts themselves. In planning the initiative, the business analyst considers:

- how experienced the stakeholders are in expressing their information and communication requirements in the business intelligence context, and
- how skilled the business analysts are in interpreting those requirements into detailed specifications for business intelligence technical specialists.

Business intelligence solutions typically provide frameworks, tools, and techniques that can assist in requirements definition and solution modelling. The level of stakeholders' and business analysts' expertise in these can have an impact on the planned approach.

When assessing stakeholder attitudes towards the business intelligence initiative, the business analyst should be aware that an enterprise-wide business intelligence solution might not provide direct value to some operational stakeholders, but will deliver it elsewhere in the organization, and the flexibility and extensibility provided by the business intelligence infrastructure delivers longer-term strategic value that goes beyond short-term operational benefits.

A business intelligence solution that integrates multiple data sources typically engages many stakeholders with overlapping information requirements. Business analysts prepare for the analysis and synthesis of individual requirements into a set that is complete and cohesive without conflicts and redundancies.

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- Functional Decomposition (p. 283)
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- Non-Functional Requirements Analysis (p. 302)
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.2 Elicitation and Collaboration

The cross-functional nature of business intelligence typically requires business analysts to employ specialized documentation tools and techniques to elicit particular types of requirements from stakeholders, both business and technical.

Individual stakeholders may only possess partial knowledge and expertise regarding:

- the business decisions that need support,
- the data elements that support those business decisions,
- the data sourcing, transformation, and integration rules, and
- the presentation of the required information.

Interviews with individual stakeholders identify the information and analytic insight required to support their decision making. Workshops with stakeholders from across different functional areas of the business can help detect common, overlapping information requirements that would be better met with an integrated solution.

Data models and data dictionaries provide definitions of the structure and business rules of existing systems data. The business analyst assesses available documentation to identify incompleteness of a model or inconsistencies between models.

Process models that are extended to include data artifacts can help identify the data sources required at decision points. Decision models specify the data analytic requirements and business rules for decisions.

Commercial off-the-shelf packages of business intelligence functionality can provide the business analyst with a set of highly effective prototyping tools to elicit and clarify stakeholder information and communication requirements.

BABOK® Guide Techniques

- Brainstorming (p. 227)
- Document Analysis (p. 269)
- Focus Groups (p. 279)
- Functional Decomposition (p. 283)
- Glossary (p. 286)
- Interface Analysis (p. 287)
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.3 Requirements Life Cycle Management

The architectural nature of the business intelligence discipline requires establishing the infrastructure capabilities in the solution. This can introduce structural dependencies within the solution, particularly where delivery is phased,

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that affect the prioritization of individual business needs. It is often possible to achieve efficiencies by implementing related requirements at the same time.

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- Item Tracking (p. 294)
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- Prioritization (p. 311)
- Reviews (p. 326)
- Roles and Permissions Matrix (p. 333)
- Stakeholder List, Map, or Personas (p. 344)
- Workshops (p. 363)

.4 Strategy Analysis

Business analysts can use high-level conceptual data models to map the current state of corporate information, to identify information silos, and to assess their related problems and opportunities. Organization Modelling can be used to evaluate any current data management infrastructure, such as metadata management and data governance.

In defining the future state strategy, business analysts can use high-level models to map the architecture for data storage and for data conveyance and transformation:

- **Logical data models**: provide a static view of the solution architecture, representing the information portal that connects the sourcing of operational data inputs with the delivery of the business information outputs.
- **Data flow diagrams**: are commonly used to map the dynamic aspects of the solution (data-in-motion) and to identify other architectural constructs such as latency and accessibility.
- **Decision models**: are useful for defining how relevant business decisions are made and where and how data analytics can be effectively used to meet these needs.
- **Physical data models**: show the implementation environment including the data warehouse and data marts.

The extensible architecture provided by business intelligence solutions can support incremental implementation across different functional areas of the business. Business analysts can define change strategy options based on business needs and priorities, impact on the business operations, and the usability of existing infrastructure components.

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- Backlog Management (p. 220)
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- Root Cause Analysis (p. 335)
- Stakeholder List, Map, or Personas (p. 344)
- SWOT Analysis (p. 353)

.5 Requirements Analysis and Design Definition

When modelling and specifying back office data capture and storage requirements, business analysts use specific data-oriented modelling techniques such as Data Modelling, Data Dictionary, Decision Modelling, and Business Rules Analysis.

Models of an existing system's data help to define data availability and identify redundancies, inconsistencies, and data quality issues. Where existing systems documentation is non-existent or out of date, reverse-engineered modelling can be a substantial component of work, and frequently requires collaboration with technical experts such as database administrators and application programmers.

A future state data model demonstrates how the source information is generically structured in the proposed solution. The overall transformation process is commonly modelled using Data Flow Diagrams to illustrate the management of latency and accessibility requirements in the solution. Business analysts define specific business rules for data integrity checking and for data transformation.

For modelling and specifying front office information outputs, business analysts:

- analyze existing reports to determine if they are candidates to be replaced or repaired with business intelligence outputs, and
- use business intelligence capabilities such as ad hoc queries, data mining, and complex event processing to identify and specify the content and format of new business intelligence outputs.

Business analysts are involved in assessing the capability of a proposed solution (typically a commercial off-the-shelf software package) in respect of the specified requirements. In the business intelligence context, these include functional requirements such as self-serve facilities, data analytics tools, data presentation tools, drill down capabilities, and non-functional requirements related to issues such as data quality, data latency, and query performance.

.6 BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
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- Vendor Assessment (p. 361)

.7 Solution Evaluation

A common enterprise limitation with the introduction of a business intelligence solution is the under-utilization of the information resource and analytic functionality that the solution provides. Stakeholders who are not familiar with the capabilities of business intelligence might focus on simply replacing or repairing existing information outputs. Business analysts explore and evaluate opportunities for additional value that are enabled by a business intelligence solution.

.8 BABOK® Guide Techniques

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11.3 The Information Technology Perspective

The Information Technology Perspective highlights the characteristics of business analysis when undertaken from the point of view of the impact of the change on information technology systems.

This perspective focuses on non-agile approaches to IT initiatives.

When working in the information technology (IT) discipline, business analysts deal with a wide range of complexity and scope of activities. Initiatives may be as small as minor bug fixes and enhancements, or as large as re-engineering the entire information technology infrastructure for an extended enterprise. Business analysts are called upon to work with this diverse level of knowledge and skills among stakeholders to deliver valuable solutions to their IT needs.

For information regarding agile approaches within information technology initiatives, see The Agile Perspective (p. 368).

Being able to effectively articulate the business' vision and needs to technical stakeholders is central to the success of a business analyst in the information technology discipline. Business analysts proactively collaborate with both the business stakeholders and development teams to ensure that needs are understood and aligned with organizational strategy. A business analyst frequently plays the role of the translator who helps business and technology stakeholders understand each other's needs, constraints, and context. The concept of solution design is appropriate in a technology context, and from the IT business analyst's point of view. However, the term 'design', when discussed within an IT setting, is generally assumed to mean 'technical design' or the utilization of technologies to solve business problems. Business analysts within an IT context define and elaborate solution requirements or participate in solution design with business stakeholders while maintaining a separation with technical design.

Important

In IT contexts, the term 'design' has traditionally been reserved for solution or technical design performed by developers, IT architects, or solution architects. All work done by IT business analysts is covered by the term 'requirements', including concepts such as the definition and design of business processes, user interfaces, reports or other elements of the solution relevant to stakeholders outside of the implementation team. Business analysts working in this context may prefer the term 'solution requirements' instead of 'design' in order to maintain a clear separation of responsibility.

Business analysts working in an information technology environment consider their tasks in light of three key factors:

- **Solution impact**: the value and risk of the solution to the business.
- **Organizational maturity**: the formality and flexibility of the organizational change processes.
- **Change scope**: the breadth, depth, complexity, and context for the proposed change.

11.3.1 Change Scope

Changes to IT systems are initiated for several reasons.

Each of the following triggers can lead to an IT change:

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- **Create a new organizational capability**: can be executed to transform the organization. These types of IT initiatives may drive the creation of larger programs to address non-IT changes, but are centered on a technology that alters the business environment.
- **Achieve an organizational objective by enhancing an existing capability**: is part of a change that meets a defined need. This may include changes to meet regulatory requirements or to enable business specific goals. These types of initiatives often modify an existing system but may also require implementation and integration of new systems.
- **Facilitate an operational improvement**: is undertaken to improve organizational efficiency or reduce organizational risk. The change scope, organizational maturity, and solution impact dictate whether these changes will be managed as a project, part of a continuous improvement effort, or as an enhancement.
- **Maintain an existing information technology system**: is undertaken to ensure smooth operation of an existing IT system. Depending on the scope of the change, maintenance may be managed as a project or a regularly scheduled activity. This may include technology driven changes such as a vendor discontinuing support of a technology, scheduled releases or upgrades to a purchased software package, or technical modifications required to support architecture strategy.
- **Repair a broken information technology system**: is undertaken when an IT system that is not performing as expected is changed to correct the dysfunction. The urgency of the repair is generally based on the level of disruption caused. In some cases the scope of the repair effort is very large, so the repair is managed as a project.

.1 Breadth of Change

Information technology initiatives may focus on a single system or on multiple systems which interact with each other. Some systems are developed and maintained in-house while others are commercial off-the-shelf (COTS) systems developed by an organization that is external to the group implementing the system. It is also possible that an external organization completes custom development, such as when development tasks are outsourced or contracted.

The scope of an IT initiative is often narrowly focused on software and hardware and a minimal set of systems, applications, or stakeholders. Larger initiatives may impact multiple user groups or systems, and often require collaboration with the extended enterprise. The implementation of COTS information technology systems may begin with a small or limited scope when the change is initiated, but after analysis is complete the scope is broader than originally anticipated. The business analysis approach for a COTS selection and implementation is approached differently than in-house development. These IT systems almost always require customization, integration, administration, and training. In some cases, the initiatives are limited to initial installation and implementation, or enhancements to an existing application. IT initiatives may also focus on a very specific technology solution such as what data is needed, how data is gathered,

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how it is stored and accessed in order to support business transaction methods, or how information is reported and available to the business groups.

Business analysts working in IT carefully consider the context for any information technology change. They consider whether the change is managed as a project, a continuous improvement, or a maintenance activity. Business analysts also consider organizational change management and all impacts including training, communications, and adoption of the change.

The nature of business analysis activities in an IT environment depend on a variety of solution impact factors:

- What happens to the business if this system shuts down?
- What happens if the system performance degrades?
- What business capabilities and processes depend on the IT system?
- Who contributes to those capabilities and processes?
- Who uses those capabilities and processes?

When considering these solution impact factors, not only do business analysts match the formality of analysis activities to the business analysis processes defined by the organization, but also consider the importance of the IT system. The importance of the system under analysis may indicate that more analysis is needed to support and define the requirements for the change.

.2 Depth of Change

Changes in an IT environment frequently require the business analyst to define explicit details, including technical details such as the definition of individual data elements being manipulated or impacted by the change. Integration efforts can require analysis and definition at a great level of detail while identifying and defining the interfaces between IT systems. Due to the level of detail required in these types of initiatives, business analysts elicit and analyze how the organization works as a whole and how the IT system will support those operations. This provides the necessary context for the business analyst to understand whether the details being discovered and documented are relevant to delivering value. This can be particularly challenging when an IT system change is initiated for technology driven reasons but without sufficient clarity or alignment to business purpose.

.3 Value and Solutions Delivered

Information technology systems are implemented to increase organizational value, which includes any support capabilities and processes that use the system. Business analysts seek to align IT functionality to these processes and capabilities, and to measure the effect that the system has on them.

Changes to IT systems can increase value many ways, including:

- reducing operating costs,
- decreasing wasted effort,

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- increasing strategic alignment,
- increasing reliability and stability,
- automating error-prone or manual processes,
- repairing problems,
- making it possible to scale up, enhance, or make more readily available a business capability, and
- implementing new functionality and new capabilities.

.4 Delivery Approach

The delivery of business analysis activities within an IT organization varies greatly. Initiatives may range from small enhancement efforts which are completed with a single, short time frame release schedule to multi-release, phased implementations.

Short time frame initiatives may involve a single business analyst for a short period of time. Larger efforts frequently involve several business analysts who may coordinate analysis activities in several ways. Business analysts may divide work based on business group involved or by specific activity.

.5 Major Assumptions

The following is a list of major assumptions of the IT discipline:

- business capabilities and processes that use an IT system are delivering value to the organization,
- business analysts working from other perspectives can integrate their work with the work of the IT business analysts, and
- IT systems changes are usually driven by a business need, although some initiatives may originate from within technology developments.

11.3.2 Business Analysis Scope

.1 Change Sponsor

Information technology changes may be requested or sponsored by business sponsors, IT departments, or as a collaboration between the two. These changes should align to organizational strategy and business goals. It is possible for an IT department to initiate change to align with technical strategy or reach technical goals, but an overall organizational strategy alignment is still crucial for change success.

The following list represents possible change sponsors:

- technical team,
- technical executive,
- application owner,

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- process owner,
- business owner,
- internal product manager, and
- regulatory representative (such as a corporate legal department).

Enterprises may use many methods to initiate changes related to information technology. Frequently, large enterprises define a program or project management office within the IT department, which intakes requests and prioritizes efforts on behalf of the department.

.2 Change Targets

Business analysts identify all possible departments, processes, applications, and functions which can be impacted by the proposed change. A business analyst not only focuses on details of the initiative, but also keeps an eye on the larger picture and the potential impact (both business and technical) of the change. This involves a level of process and functional analysis with specific focus on both technical interfaces as well as process hand-offs.

.3 Business Analyst Position

Within an IT initiative, the business analysis activities may be filled by personnel with one of several types of backgrounds or job titles within the organization. This assignment may be dependent upon the type of change, the level of experience, knowledge needed, or simply the personnel available to staff the effort. The personnel may be assigned to the business analysis tasks due to the experience described below, and may complete some or all of the business analysis responsibilities for a given change.

It is possible that all business analysis tasks for an IT project may be completed by a person with only one of these backgrounds:

- a business analyst who works specifically with the business users of an IT system,
- an IT business analyst who is the designated liaison between the technical team and the business group which uses the application,
- a subject matter expert (SME) experienced with the current software implementation,
- a software user experienced with the daily activity of how the software is used and can focus on usability,
- a systems analyst who has experience within the business domain, but does not have experience with the specific application,
- a business process owner who has a depth of experience with the business capabilities or processes, but may not have any technical or IT experience,
- a technical person with a depth of technical experience, or

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- a COTS representative who will allow for customized implementations of a packaged solution, and leverage the knowledge of the vendor's package and past implementation experience.

.4 Business Analysis Outcomes

Within an IT initiative, a business analyst may consider business processes impacted by the change, as well as the data and business intelligence information collected by the system. Business analysts working in the initiative thoroughly plan the business analysis effort and the deliverables that support the change effort.

The change approach being utilized has a direct impact on business analysis deliverables or outcomes. Many organizations have a defined system or solution development methodology which, to some extent, dictates the deliverables which are required at each project milestone. Even within the context of this structure the business analyst may seek to complete additional deliverables beyond those required by the change approach or organization specific process, and employ techniques which support the comprehensive understanding of the change effort needed.

Business analysts working in the IT discipline are responsible for delivering any of the following:

- defined, complete, testable, prioritized, and verified requirements,
- analysis of alternatives,
- business rules,
- gap analysis,
- functional decomposition,
- use cases and scenarios, and/or user stories as appropriate,
- interface analysis,
- prototypes,
- process analysis,
- process models,
- state models,
- decision models,
- context models or scope models, and
- data models.

Additional deliverables not included in the above list but relating to any of the outputs of business analysis techniques used may also be considered deliverables of the business analyst.

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11.3.3 Methodologies

The methodologies followed by information technology organizations vary widely.

In general, solution development methodologies fall into two generic approaches:

- **Predictive**: structured processes which emphasize planning and formal documentation of the processes used to complete the change. Each phase of the process or sequence is completed before advancing to the next phase.
- **Adaptive**: processes which allow for reworking within one or more of the overall structured process cycles. Most adaptive models are both iterative and incremental, focusing on growing the product in both breadth and depth.

A hybrid methodology may also be utilized. A hybrid may include an overall vision for the whole initiative (as in predictive), as well as a definition of details within individual cycles or iterations (as in adaptive).

The following table identifies several established methodologies or approaches that a business analyst practicing in an information technology environment may encounter.

Table 11.3.1: Information Technology Methodologies

Methodology	Brief Description
Homegrown or Organization Specific	A methodology which is derived from components of other established methodologies or approaches may be created by an information technology organization to govern information technology based initiatives.
Requirements Engineering (RE)	Establishes a structured approach for requirements development and management and is used in predictive, adaptive, and agile environments.
Structured Systems Analysis and Design Method (SSADM)	A predictive development methodology that focuses on established logical modelling and the separation of requirements from solutions as central to systems analysis and specification.
Unified Process (UP)	An adaptive development approach. The inception and elaboration phases are of particular interest to business analysts. UP is not considered agile but is an adaptive methodology.

11.3.4 Underlying Competencies

A business analyst working within IT may possess skills related to IT development such as programming, creating a database, creating a system or solution

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architecture, software testing experience, or other technical skills. However, development-related skills or technical skills are not necessary for a business analyst to be successful within an IT environment. It is important for the business analyst to have a strong understanding of the detail required within a requirements package to support technical solutions, as well as an understanding of what is technically feasible within the constraints of an organization's technical architecture. These skills will enable a business analyst to work with all stakeholders to design a business solution framework which will also allow the technical team the flexibility to design a technical solution.

Business analysts use influencing and facilitation skills when working with stakeholders. Negotiation skills are frequently used when working with business and technical staff to come to agreements and decisions if the costs of a solution (either in budget, time, or architectural impact) conflict with the desired business outcome.

Systems thinking is a crucial competency for business analysts practicing in an IT environment. Systems thinking supports the ability of the business analyst to see the larger picture including any other applications or technical aspects which may be impacted, the details of the specific need, and possible technical solutions. Systems thinking also supports the ability to identify impacts to people, processes, and software which are not necessarily directly changed as part of an IT development effort, and to analyze the risks and possible outcomes of those impacts.

11.3.5 Impact on Knowledge Areas

This section explains how specific business analysis practices within information technology are mapped to business analysis tasks and practices as defined by the *BABOK® Guide*. It also describes how each knowledge area is applied or modified within the IT discipline.

Each knowledge area lists techniques relevant to an IT perspective. Techniques used in the discipline of information technology do not deviate, to any great extent, from the *BABOK® Guide* techniques. *BABOK® Guide* techniques are found in the Techniques chapter of the *BABOK® Guide*. This is not intended to be an exhaustive list of techniques but rather to highlight the types of techniques used by business analysts while performing the tasks within the knowledge area.

.1 Business Analysis Planning and Monitoring

A business analysis approach is a fundamental communication tool which can be used to identify resources required for business analysis work and ensure adequate time for the analysis effort. A well-defined business analysis plan integrates into the overall project plan and provides business analysts with the opportunity to define and schedule the business analysis activities for the project.

Many organizations have some standards and processes in place, which may identify certain analysis tasks and deliverables. If these are not in place, the business analyst identifies these tasks and deliverables based on the needs of the specific initiative.

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It is important that the context of the analysis work is understood. This includes understanding the inter-operation of software systems, business processes, and the data that is passed from one system to the next. Changes to any single system or process may have a ripple effect that brings additional systems, processes, or stakeholder groups into the scope of the initiative.

The IT business analyst may be embedded within a software team. This approach allows the business analyst to become quite knowledgeable about specific software or processes supported by the software. Stakeholder attitudes and needs may change or shift in regards to each particular change. Roles, collaboration, and communication plans are planned for every change effort.

COTS solutions can involve major systems integration efforts, customizations, and many unexpected tasks due to the introduction of external software. When planning for unknown impacts and unknown customization needs, business analysts engage both internal stakeholders who understand the needs of the change, and external stakeholders who have expertise with the COTS solution being implemented.

BABOK® Guide Techniques

- Backlog Management (p. 220)
- Document Analysis (p. 269)
- Estimation (p. 271)
- Functional Decomposition (p. 283)
- Item Tracking (p. 294)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Organizational Modelling (p. 308)
- Roles and Permissions Matrix (p. 333)
- Scope Modelling (p. 338)
- Stakeholder List, Map, or Personas (p. 344)

.2 Elicitation and Collaboration

Information technology changes frequently affect many stakeholders with distinct relationships to the solution or change. When a change involves an IT application or system, the technical staff may have expertise, perspectives, or experience that can identify additional impacts to systems or processes as requirements and solutions are defined. For this reason, it is beneficial to have at least one elicitation session with IT technical personnel, such as development or technical design staff, and business SMEs in the same room at the same time. This type of elicitation approach provides a platform for collaboration between technical and business teams, where the IT business analyst serves as a facilitator and liaison for the process.

Business analysts practicing in an IT environment may utilize any of the techniques identified in the Elicitation and Collaboration knowledge area. Additionally, the following methods can be of great benefit in the information technology discipline:

- **Investigation**: using organizational process assets, market research, competitive analysis, functional specifications, and observation,

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- **Simulations**: using statistical modelling and mock-ups, and
- **Experimentation**: using proofs of concept, prototypes, alpha- and beta-releases, and A/B testing.

Information technology changes can be seen as a distraction or cost by business stakeholders if the change is not perceived as mission critical or if the stakeholder is experiencing negative value from the change. This can make engagement for elicitation challenging. Elicitation across organizational boundaries may be impeded, causing collaboration breakdowns and rework. IT business analysts can decrease the risk of rework by engaging information technology and business resources in collaboration activities.

BABOK® Guide Techniques

- Brainstorming (p. 227)
- Collaborative Games (p. 243)
- Document Analysis (p. 269)
- Focus Groups (p. 279)
- Interface Analysis (p. 287)
- Interviews (p. 290)
- Observation (p. 305)
- Process Modelling (p. 318)
- Prototyping (p. 323)
- Scope Modelling (p. 338)
- Sequence Diagrams (p. 341)
- Stakeholder List, Map, or Personas (p. 344)
- State Modelling (p. 348)
- Survey or Questionnaire (p. 350)
- Use Cases and Scenarios (p. 356)
- Workshops (p. 363)

.3 Requirements Life Cycle Management

IT initiatives frequently experience major discoveries while creating the change. It is through exploration that the business analysts discover the implications of the new functionality provided by the solution. This sense of discovery in IT environments has led to the adaptation of short cycle times (agile and continuous improvement), rigorous change control (Capability Maturity Model Integration (CMMI) and predictive), and externalized information technology (Software as a Service (SaaS) and cloud services).

Business analysts working in IT pay particular attention to alignment, approval, change control, traceability, and requirements life cycle management tools. It is the role of the business analyst to work with stakeholders to develop a consistent method for reviewing evolving requirements to ensure alignment with the business objectives for the initiative.

In many cases, changes to approved requirements are driven by changes to higher-level requirements such as business objectives. Business analysts collaborate with stakeholders to ensure these requirements are stable before proceeding to solution or technical requirements. When changes to requirements are presented, the business analyst analyzes the impact and plans how to manage proposed changes.

As the complexity of an information technology environment grows, it becomes increasingly important to track each change to each requirement or between

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requirements and other information. Traceability that includes dependencies and relationships among requirements makes it easier for stakeholders to understand what is changing about the IT system and predict impacts of additional changes.

As technical systems are changed over time, it is helpful when each version of each requirement is stored in some way and accounted for. Traceability makes it possible to find the source and owner of each requested function and feature, as well as why, when, and how it changed over time. This history is important for ensuring that the requirements are complete and that the approval of requirements is a sensible decision. When the change–work and the IT system are audited, regulators and other interested parties can understand what happened, when, and why. This can be especially important for audit purposes, when an application manages data or processes systematically without human intervention for each transaction or instance of the process occurring. This tracing also helps the organization understand why some functionality is not delivered or implemented in the IT system, and why it was dropped from the scope of this implementation.

BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Decision Analysis (p. 261)
- Item Tracking (p. 294)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Prioritization (p. 311)

.4 Strategy Analysis

Within an IT organization, strategy analysis focuses on the technologies and systems, business units, business processes, and business strategies impacted by a proposed change. It is possible that the impacts of a change cause a ripple effect through other systems in the organization. In order to analyze needs and proposed changes, business analysts seek to understand all the various aspects that may be impacted by the change.

Current state analysis within IT initiatives includes analysis of manual processes, understanding what the system or technology currently does, the data needed to complete tasks, and the other systems and processes that interact with the system. Business analysts plan for a thorough understanding of the current state and a large context of the enterprise at first, with the understanding that the scope will narrow as the future state is identified.

Once the current state is understood, the desired future state is described. This may be process or capability related and usually includes how current system functionality is required to change in order to support the future vision and meet the objectives of both individual stakeholders and the enterprise. In understanding both the current and future states, the gap between the two is identified, and that is where the direction of the change effort can be set. It is at this point of analysis that solution options are explored.

Once the aspects of the change scope and desired future state are understood, business analysts assess uncertainty and risk. Uncertainty is clarified by:

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- identifying and defining risks,
- identifying and defining potential benefits,
- establishing parameters for variance in known processes and operations, and
- exploring the unknown.

Business analysts also explore other potential risks including:

- vendor risks, such as their business and product stability,
- impacts to the system's technical environment,
- scalability of the solution should volumes of transactions or users increase over time, and
- additional process or system changes required based on the change initiated.

BABOK® Guide Techniques

- Business Capability Analysis (p. 230)
- Focus Groups (p. 279)
- Functional Decomposition (p. 283)
- Interviews (p. 290)
- Item Tracking (p. 294)
- Observation (p. 305)
- Process Analysis (p. 314)
- Process Modelling (p. 318)
- Scope Modelling (p. 338)
- Survey or Questionnaire (p. 350)
- SWOT Analysis (p. 353)
- Vendor Assessment (p. 361)
- Workshops (p. 363)

.5 Requirements Analysis and Design Definition

It is important for business analysts working in IT to understand and clarify the term 'design'. Many IT organizations think of design only as it applies to the design or blueprint of a software or technical change. Within the Requirements Analysis and Design Definition knowledge area, the term design is viewed more broadly and from the business analyst's point of view. Designs are usable representations that focus on the solution and understanding how value might be realized by a solution if it is built. For example, a model of a potential process improvement (whether it impacts or utilizes an IT system or not), as well as user interface layouts or report definitions, can all be considered designs.

Business analysts elaborate business and technical requirements, break down and define stakeholder needs, and identify the value to be realized by stakeholders once a technical solution or change is implemented. They elicit, define, and analyze business and stakeholder requirements, and also define, analyze, and model solution designs. They define requirements to a level of technical detail that will be used as part of solution design and input into technical designs. This elaboration will include both functional requirements and non-functional

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requirements. For some change initiatives, the definition of non-functional requirements could define all business goals for the change effort.

Business analysts often rely on other change agents to produce technical designs for software solutions. A systems architect, programmer, database manager, or other technical expert is often needed to determine how to use technology to satisfy a set of requirements. IT business analysts define process steps, business rules, screen flows, and report layouts. Defining requirements to include detailed functionality of a system, the business, and system processes is a crucial part of solution design and does not separate analysis and design.

As part of requirements analysis, an IT business analyst may partner with another business analyst with a different focus, such as an enterprise business analyst or business architect, to ensure that the IT requirements align to business or organizational strategy.

Requirements analysis and design definition frequently involves documenting requirements using words and pictures. In some cases, requirements may be represented in other ways such as a proof of concept, working software prototypes, or simulations. In all cases, the business analyst works to produce documentation with sufficient and appropriate details for:

- the business to verify and validate the requirements,
- the developers to design from, and
- the testers to measure the solution against before it is implemented into a production environment.

BABOK® Guide Techniques

- Business Rules Analysis (p. 240)
- Data Dictionary (p. 247)
- Data Flow Diagrams (p. 250)
- Data Modelling (p. 256)
- Decision Analysis (p. 261)
- Decision Modelling (p. 265)
- Document Analysis (p. 269)
- Estimation (p. 271)
- Functional Decomposition (p. 283)
- Glossary (p. 286)
- Interface Analysis (p. 287)
- Non-Functional Requirements Analysis (p. 302)
- Organizational Modelling (p. 308)
- Process Modelling (p. 318)
- Prototyping (p. 323)
- Reviews (p. 326)
- Roles and Permissions Matrix (p. 333)
- Scope Modelling (p. 338)
- Sequence Diagrams (p. 341)
- State Modelling (p. 348)
- Use Cases and Scenarios (p. 356)
- User Stories (p. 359)

.6 Solution Evaluation

Solution evaluation focuses on solution components and the value they provide. Within an IT context, this includes a focus on the interactions between multiple

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systems within the change and the surrounding environment. It is important for a business analyst working in the IT discipline to understand the context of the solution and how changes within one system or process can impact other systems within the environment. These impacts can add negative or positive value to the other systems, therefore impacting the overall realization of value for the change.

One aspect of solution evaluation within an IT context is software testing or solution testing. Testing or quality assurance ensures that the solution performs as anticipated or designed, and that it meets the needs of the business or stakeholders who requested the change effort. The business analyst works with quality assurance (testers) to ensure that technical solutions will meet the business needs as defined by the requirements and other business analysis deliverables. Testers utilize testing methodologies to plan, develop, and execute tests. This aspect of solution testing generally focuses on complete process testing, including across systems to ensure end-to-end solution quality and accuracy. Business analysts work with stakeholders to plan, develop, and execute user acceptance tests to ensure that the solution meets their needs.

Business analysts make themselves aware of the rationale for implementing an IT solution and how that rationale works to create solution value. This value realization is commonly associated with better support for business processes and procedures.

Business and technical objectives are associated with benefits and value realization which are measured against defined metrics used to evaluate success. Requirements should trace back to the objectives, and this traceability provides a foundation for solution evaluation. The analysis of solution performance focuses on technical systems and how they provide potential and actual value to stakeholders.

Where a large organizational change contains an IT element, an IT solution evaluation can contribute to a broader benefits realization activity associated with the whole change program.

As part of solution evaluation activities, a business analyst may work with a team to complete tasks, such as assessing solution limitations and assessing the impacts of such limitations. The business analyst may support and assess technical testing efforts for all, or a portion of, the developed solution.

BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Decision Analysis (p. 261)
- Estimation (p. 271)
- Item Tracking (p. 294)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Organizational Modelling (p. 308)
- Risk Analysis and Management (p. 329)
- Process Modelling (p. 318)
- SWOT Analysis (p. 353)
- Vendor Assessment (p. 361)

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11.4 The Business Architecture Perspective

The Business Architecture Perspective highlights the unique characteristics of business analysis when practiced in the context of business architecture.

Business architecture models the enterprise in order to show how strategic concerns of key stakeholders are met and to support ongoing business transformation efforts.

Business architecture provides architectural descriptions and views, referred to as blueprints, to provide a common understanding of the organization for the purpose of aligning strategic objectives with tactical demands. The discipline of business architecture applies analytical thinking and architectural principles to the enterprise level. The solutions may include changes in the business model, operating model, organizational structure, or drive other initiatives.

Business architecture follows certain fundamental architectural principles:

- **Scope**: the scope of business architecture is the entire enterprise. It is not a single project, initiative, process, or piece of information. It puts projects, processes, and information into the larger business context to provide an understanding of interactions, integration opportunities, redundancies, and inconsistencies.
- **Separation of concerns**: business architecture separates concerns within its context. It specifically separates what the business does from:
  - the information the business uses,
  - how the business is performed,
  - who does it and where in the enterprise it is done,
  - when it is done,
  - why it is done, and
  - how well it is done.

  Once the independent concerns are identified, they can be grouped in specific combinations or mappings, which can be used to analyze targeted business issues.
- **Scenario driven**: there are many different questions that a business tries to answer to provide the blueprint for alignment. Each of these different questions or business scenarios requires a different set of blueprints containing a different set of information and relationships, with different types of outcomes and measures to determine success.
- **Knowledge based**: while the primary goal of business architecture is to answer these business questions, a secondary but important goal is to collect and catalogue the different architectural components (what, how, who, why, etc.) and their relationships in a knowledge base so they can quickly and easily be used to help answer the next business question that comes up. The knowledge base is often managed in a formal architectural repository.

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11.4.1 Change Scope

.1 Breadth of Change

Business architecture may be performed:

- across the enterprise as a whole,
- across a single line of business within the enterprise (defining the architecture of one of the enterprise's business models), or
- across a single functional division.

Business architecture activities are generally performed with a view of the entire enterprise in mind, but may also be performed for an autonomous business unit within the enterprise. A broad scope is required to manage consistency and integration at the enterprise level. For example, business architecture can clarify a situation where the same business capability is implemented by multiple different processes and multiple different organizations using different information models. Given the clarity that comes from an enterprise scope, the business can then determine if this structure is the best way to align with strategic objectives.

.2 Depth of Change

A business architecture effort may focus on the executive level of the enterprise to support strategic decision making, or on the management level to support the execution of initiatives.

While business architecture provides important context, it does not usually operate at the operational decision or process level; instead, it assesses processes at the level of the value stream.

.3 Value and Solutions Delivered

Business architecture, using the principle of separation of concerns, develops models that decompose the business system, solution, or organization into individual elements with specific functions and shows the interactions between them.

The elements of business architecture models include:

- capabilities,
- value,
- processes,
- information and data,
- organization,
- reporting and management,
- stakeholders,
- security strategies, and
- outcomes.

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Architecture models enable organizations to see the big picture of the domain that is under analysis. They provide insights into the important elements of the organization or software system and how they fit together, and highlight the critical components or capabilities.

The insights provided by business architecture help keep systems and operations functioning in a coherent and useful manner, and add clarity to business decisions. When change is being considered, the architecture provides details on the elements that are most relevant for the purposes of the change, allowing for prioritization and resource allocation. Because an architectural model also shows how the parts are related, it can be used to provide impact analysis to tell what other elements of the system or the business might be affected by the change.

The architecture itself can be used as a tool to help identify needed changes. The performance metrics for each element of the architecture can be monitored and assessed to identify when an element is under-performing. The importance of each element can be compared with the performance of the organization or system as a whole. This assists decision makers when considering where investment is needed and how to prioritize those decisions.

The function of business architecture is to facilitate coordinated and synchronized action across the organization by aligning action with the organization's vision, goals, and strategy. The architectural models created in this process are the tools used to clarify, unify, and provide understanding of the intent of the vision, goals, and strategy, and to ensure that resources are focused and applied to the elements of the organization that align with and support this direction.

Business architecture provides a blueprint that management can use to plan and execute strategies from both information technology (IT) and non-IT perspectives. Business architecture is used by organizations to guide:

- strategic planning,
- business remodelling,
- organization redesign,
- performance measurement and other transformation initiatives to improve customer retention,
- streamlining business operations,
- cost reduction,
- the formalization of institutional knowledge, and
- the creation of a vehicle for businesses to communicate and deploy their business vision.

.4 Delivery Approach

Business architecture creates a planning framework that provides clarity and insight into the organization and assists decision makers in identifying required changes. The architectural blueprints provided by business architecture provide an insight and understanding of how well the organization aligns to its strategy. This insight is the trigger for change or other planning activities.

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For each blueprint provided, business architecture may define:

- current state,
- future state, and
- one or more transition states that are used to transition to the future state.

Business architects require a view of the entire organization. In general, they may report directly to a member of senior leadership. Business architects require a broad understanding of the organization, including its:

- environment and industry trends,
- structure and reporting relationships,
- value streams,
- capabilities,
- processes,
- information and data stores, and
- how all these elements align to support the strategy of the organization.

Business architects play an important role in communicating and innovating for the strategy of the organization. They utilize blueprints, models, and insights provided by business architecture to continually advocate for the strategy of the organization and address individual stakeholder needs within the scope of the organization's goals.

There are several factors central to a successful business architecture:

- support of the executive business leadership team,
- integration with clear and effective governance processes, including organizational decision-making authorities (for example, for investments, initiatives, and infrastructure decisions),
- integration with ongoing initiatives, (this might include participation in steering committees or other similar advisory groups), and
- access to senior leadership, departmental managers, product owners, solution architects, project business analysts, and project managers.

.5 Major Assumptions

To make business architecture useful to the organization, business analysts require:

- a view of the entire organization that is under analysis,
- full support from the senior leadership,
- participation of business owners and subject matter experts (SMEs),
- an organizational strategy to be in place, and
- a business imperative to be addressed.

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11.4.2 Business Analysis Scope

.1 Change Sponsor

Ideally, the sponsor of a business architecture initiative is a senior executive or business owner within the organization. However, the sponsor may also be a line-of-business owner.

.2 Change Targets

The following list identifies the possible primary change targets resulting from a business architecture analysis:

- business capabilities,
- business value streams,
- initiative plans,
- investment decisions, and
- portfolio decisions.

The following groups of people use business architecture to guide change within the organization:

- management at all levels of the organization,
- product or service owners,
- operational units,
- solution architects,
- project managers, and
- business analysts working in other contexts (for example, at the project level).

.3 Business Analyst Position

The goal of a business analyst working within the discipline of business architecture is to:

- understand the entire enterprise context and provide balanced insight into all the elements and their relationship across the enterprise, and
- provide a holistic, understandable view of all the specialties within the organization.

Business architecture provides a variety of models of the organization. These models, or blueprints, provide holistic insight into the organization that becomes the basis for strategic decisions by the leaders of the organization. To develop a business architecture, the business analyst must understand, assimilate, and align a wide variety of specialties that are of strategic concern to the organization. To

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do this they require insight, skills, and knowledge from:

- business strategy and goals,
- conceptual business information,
- enterprise IT architecture,
- process architecture, and
- business performance and intelligence architecture.

Business architecture supports the strategic advisory and planning groups that guide and make decisions regarding change within the organization. It provides guidance and insights into how decisions align to the strategic goals of the organization, and ensures this alignment throughout the various transition states as the change moves towards its future state.

.4 Business Analysis Outcomes

Business architecture provides a broad scope and a holistic view for business analysis.

The general outcomes of business architecture include:

- the alignment of the organization to its strategy,
- the planning of change in the execution of strategy, and
- ensuring that as change is implemented, it continues to align to the strategy.

These business architecture outcomes provide context for requirements analysis, planning and prioritization, estimation, and high-level system design. This provides insight and alignment with strategy, stakeholder needs, and business capabilities. Architectural views and blueprints provide information that may have otherwise been based on assumptions, and minimize the risk of duplication of efforts in creating capabilities, systems, or information that already exist elsewhere in the enterprise.

The various models and blueprints provided by business architecture are its key deliverables. These include, but are not limited to:

- business capability maps,
- value stream maps,
- organization maps,
- business information concepts,
- high-level process architecture, and
- business motivation models.

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11.4.3 Reference Models and Techniques

.1 Reference Models

Reference models are predefined architectural templates that provide one or more viewpoints for a particular industry or function that is commonly found across multiple sectors (for example, IT or finance).

Reference models are frequently considered the default architecture ontology for the industry or function. They provide a baseline architecture starting point that business architects can adapt to meet the needs of their organization.

The follow table lists some of the common reference models.

Table 11.4.1: Business Architecture Reference Models

Reference Model	Domain
Association for Cooperative Operations Research and Development (ACORD)	Insurance and Financial industries
Business Motivation Model (BMM)	Generic
Control Objectives for IT (COBIT)	IT governance and management
eTOM and FRAMEWORX	Communications sector
Federal Enterprise Architecture Service Reference Model (FEA SRM)	Government (developed for the U.S. Federal Government)
Information Technology Infrastructure Library (ITIL®)	IT service management
Process Classification Framework (PCF)	Multiple sectors including aerospace, defence, automotive, education, electric utilities, petroleum, pharmaceutical, and telecommunications
Supply Chain Operations Reference (SCOR)	Supply chain management
Value Reference Model (VRM)	Value change and network management

.2 Techniques

The following table lists techniques that are commonly used within the discipline of business architecture, and are not included in the Techniques section of the *BABOK® Guide*.

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Table 11.4.2: Business Architecture Techniques

Technique	Description
Archimate®	An open standard modelling language.
Business Motivation Model (BMM)	A formalization of the business motivation in terms of mission, vision, strategies, tactics, goals, objectives, policies, rules, and influencers.
Business Process Architecture	The modelling of the processes, including interface points, as a means of providing a holistic view of the processes that exist within an organization.
Capability Map	A hierarchical catalogue of business capabilities, or what the business does. Capabilities are categorized according to strategic, core, and supporting.
Customer Journey Map	A model that depicts the journey of a customer through various touch points and the various stakeholders within the service or organization. Customer journey maps are frequently used to analyze or design the user experience from multiple perspectives.
Enterprise Core Diagram	Models the integration and standardizations of the organization.
Information Map	A catalogue of the important business concepts (fundamental business entities) associated with the business capabilities and value delivery. This is typically developed in conjunction with the capability model and represents the common business vocabulary for the enterprise. It is not a data model but rather a taxonomy of the business.
Organizational Map	A model that shows the relationship of business units to each other, to external partners, and to capabilities and information. Unlike a typical organizational chart the map is focused on the interaction between units, not the structural hierarchy.
Project Portfolio Analysis	Used to model programs, projects, and portfolios to provide a holistic view of the initiatives of the organization.
Roadmap	Models the actions, dependencies, and responsibilities required for the organization to move from current state, through the transition states, to the future state.
Service-Oriented Analysis	Used to model analysis, design, and architecture of systems and software to provide a holistic view of the IT infrastructure of the organization.

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Table 11.4.2: Business Architecture Techniques (Continued)

Technique	Description
The Open Group Architecture Framework (TOGAF®)	Provides a method for developing enterprise architecture. Phase B of the TOGAF Architecture Development Method (ADM) is focused on the development of business architecture. Organizations following TOGAF may choose to tailor Phase B to adopt the business architecture blueprints, techniques, and references described in the *BABOK® Guide*.
Value Mapping	Value mapping provides a holistic representation of the stream of activities required to deliver value. It is used to identify areas of potential improvement in an end–to–end process. Although there are several different types of value mapping, a value stream is often used in business architecture.
Zachman Framework	Provides an ontology of enterprise primitive concepts based on a matrix of six interrogatives (what, how, where, who, when, why) and six levels of abstraction (executive, business management, architect, engineer, technician, enterprise). Business architects may find that exploring the executive or business management perspectives across the different interrogatives provides clarity and insight.

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11.4.4 Underlying Competencies

In addition to the underlying competencies, business analysts working in the discipline of business architecture require:

- a high tolerance for ambiguity and uncertainty,
- the ability to put things into a broader context,
- the ability to transform requirements and context into a concept or design of a solution.
- the ability to suppress unnecessary detail to provide higher level views,
- the ability to think in long time frames over multiple years,
- the ability to deliver tactical outcomes (short term), which simultaneously provide immediate value and contribute to achieving the business strategy (long term),
- the ability to interact with people at the executive level,
- the ability to consider multiple scenarios or outcomes,
- the ability to lead and direct change in organizations, and
- a great deal of political acumen.

11.4.5 Impact on Knowledge Areas

This section explains how specific business analysis practices within business architecture are mapped to business analysis tasks and practices as defined by the *BABOK® Guide*. This section describes how each knowledge area is applied or modified within the business architecture discipline.

Each knowledge area lists techniques relevant to a business architecture perspective. *BABOK® Guide* techniques are found in the Techniques chapter of the *BABOK® Guide*. Other business analysis techniques are not found in the Techniques chapter of the *BABOK® Guide* but are considered to be particularly useful to business analysts working in the discipline of business architecture. This is not intended to be an exhaustive list of techniques but rather to highlight the types of techniques used by business analysts while performing the tasks within the knowledge area.

.1 Business Analysis Planning and Monitoring

During Business Analysis Planning and Monitoring, the discipline of business architecture requires business analysts to understand the organization's:

- strategy and direction,
- operating model and value proposition,
- current business and operational capabilities,
- stakeholders and their points of engagement,
- plans for growth, governance, and planning processes,
- culture and environment, and
- capacity for change.

Once these elements are understood the business analyst can then develop an understanding of which architectural viewpoints are relevant to the analysis.

Governance planning and monitoring activities primarily focus on:

- selecting which projects or initiatives will provide the most benefit in achieving the business strategies and outcomes, and
- determining which frameworks or models exist or are utilized within the organization.

BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Brainstorming (p. 227)
- Business Capability Analysis (p. 230)
- Decision Analysis (p. 261)
- Estimation (p. 271)
- Functional Decomposition (p. 283)
- Interviews (p. 290)
- Item Tracking (p. 294)
- Metrics and Key Performance Indicators (KPIs) (p. 297)

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- Non-Functional Requirements Analysis (p. 302)
- Organizational Modelling (p. 308)
- Process Modelling (p. 318)
- Reviews (p. 326)
- Risk Analysis and Management (p. 329)
- Roles and Permissions Matrix (p. 333)
- Root Cause Analysis (p. 335)
- Scope Modelling (p. 338)
- Stakeholder List, Map, or Personas (p. 344)
- Survey or Questionnaire (p. 350)
- Use Cases and Scenarios (p. 356)
- User Stories (p. 359)

Other Business Analysis Techniques

- Business Process Architecture
- Capability Map
- Project Portfolio Analysis
- Service-oriented Analysis

.2 Elicitation and Collaboration

Business analysts working in the discipline of business architecture typically deal with a great deal of ambiguity and uncertainty. When undertaking Elicitation and Collaboration tasks, business analysts consider changes in organizational direction based on external and internal forces and changes in marketplace environment. The types of changes can frequently be predicted, but external market pressures frequently make the pace of the change unpredictable.

As business architecture requires many inputs from across the organization, access to (and the availability of) stakeholders is critical to success. Business analysts elicit inputs such as strategy, value, existing architectures, and performance metrics.

Advocacy for the organization's strategy is central to the communication strategy of business architects. As members of various steering committees and advisory groups, business architects utilize formal communication channels within projects, initiatives, and operational groups to communicate the organization's strategy, explain the organizational context, and advocate alignment with the strategy.

Ensuring stakeholders understand and support the organization's strategy is an essential function within the discipline of business architecture. Business architects may impose scope and constraints on a project or initiative as a means to ensure the activity aligns to the organization's strategy, which may be viewed unfavourably. It is the role of the business architect to bridge the needs and desires of individual stakeholders, projects, and operational groups with the context and understanding of the organizational goals and strategy. The business architect's goal is to optimize the enterprise's goals and strategy, and discourage activities that achieve a narrow goal at the cost of sub-optimizing the entire objective. This is an exercise in both elicitation and in collaboration.

The business architect acquires a deep understanding of the strategy, drivers, motivations, and aspirations of the organization and those of the stakeholders. Once this level of understanding is achieved, the business architect collaborates

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with all levels of the organization including senior leadership, managers, the project management office (PMO), product owners, project managers, various business analysts, solution architects, and IT personnel to bridge gaps in understanding and communicating the importance of alignment with organizational strategy. Facilitating effective collaboration requires that the business architect is able to understand the wide variety of perspectives and contexts from which each stakeholder operates. The business architect must also be able to communicate with each of these stakeholders in a language that is mutually understood and supported.

BABOK® Guide Techniques

- Brainstorming (p. 227)
- Document Analysis (p. 269)
- Focus Groups (p. 279)
- Functional Decomposition (p. 283)
- Glossary (p. 286)
- Interface Analysis (p. 287)
- Interviews (p. 290)
- Item Tracking (p. 294)
- Observation (p. 305)
- Prototyping (p. 323)
- Stakeholder List, Map, or Personas (p. 344)
- Survey or Questionnaire (p. 350)
- Workshops (p. 363)

Other Business Analysis Techniques

- none

.3 Requirements Life Cycle Management

It is essential that business analysts working in the discipline of business architecture have executive support and agreement of the work to be undertaken. An architecture review board comprised of senior executives with decision-making powers can review and assess changes to the business architecture. This group will often also engage in portfolio management by making decisions regarding the investment in and prioritization of change based on their impact to business outcomes and strategy.

Business analysts working in the discipline of business architecture understand how projects impact the business architecture on an ongoing basis and work to continually expand, correct, or improve the business architecture. They also identify possible emerging changes in both internal and external situations (including market conditions), and decide on how to incorporate these changes into the business architecture of the organization.

BABOK® Guide Techniques

- Balanced Scorecard (p. 223)
- Benchmarking and Market Analysis (p. 226)
- Business Capability Analysis (p. 230)
- Collaborative Games (p. 243)
- Data Modelling (p. 256)
- Decision Analysis (p. 261)
- Estimation (p. 271)

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- Interface Analysis (p. 287)
- Item Tracking (p. 294)
- Lessons Learned (p. 296)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Organizational Modelling (p. 308)
- Process Analysis (p. 314)
- Process Modelling (p. 318)
- Reviews (p. 326)
- Risk Analysis and Management (p. 329)
- Roles and Permissions Matrix (p. 333)
- Root Cause Analysis (p. 335)
- Stakeholder List, Map, or Personas (p. 344)
- SWOT Analysis (p. 353)

Other Business Analysis Techniques

- Archimate®
- Business Process Architecture
- Business Value Modelling
- Capability Map
- Enterprise Core Diagram
- Project Portfolio Analysis
- Roadmap
- Service-oriented Analysis
- Value Mapping

.4 Strategy Analysis

Business architecture can play a significant role in strategy analysis. It provides architectural views into the current state of the organization and helps to define both the future state and the transition states required to achieve the future state.

Business architects develop roadmaps based on the organization's change strategy. Clearly defined transition states help ensure that the organization continues to deliver value and remain competitive throughout all the phases of the change. To keep competitive, the business must analyze such factors as:

- market conditions,
- which markets to move into,
- how the organization will compete in the transition state, and
- how to best position the organization's brand proposition.

Business architecture provides the enterprise context and architectural views that allow an understanding of the enterprise so these questions can be analyzed in the context of cost, opportunity, and effort.

BABOK® Guide Techniques

- Balanced Scorecard (p. 223)
- Benchmarking and Market Analysis (p. 226)
- Brainstorming (p. 227)
- Business Capability Analysis (p. 230)
- Business Model Canvas (p. 236)
- Business Rules Analysis (p. 240)
- Collaborative Games (p. 243)
- Data Modelling (p. 256)
- Document Analysis (p. 269)
- Estimation (p. 271)
- Focus Groups (p. 279)

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- Glossary (p. 286)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Organizational Modelling (p. 308)
- Reviews (p. 326)
- Risk Analysis and Management (p. 329)
- Stakeholder List, Map, or Personas (p. 344)
- Survey or Questionnaire (p. 350)
- SWOT Analysis (p. 353)
- Workshops (p. 363)

Other Business Analysis Techniques

- Archimate®
- Business Process Architecture
- Capability Map
- Customer Journey Map
- Enterprise Core Diagram
- Project Portfolio Analysis
- Roadmap
- Service-oriented Analysis
- Strategy Map
- Value Mapping

.5 Requirements Analysis and Design Definition

Business architecture provides individual architectural views into the organization through a variety of models that are selected for the stakeholders utilizing the view. These architectural views can be provided by capability and value maps, organizational maps, and information and business process models. Business analysts working in the discipline of business architecture employ expertise, judgment, and experience when deciding what is (and what is not) important to model. Models are intended to provide context and information that result in better requirements analysis and design.

The architectural context and the ability to reference readily available architectural views provides information that would have otherwise been based on assumptions that the analyst must make because no other information was available. By providing this information, business architecture minimizes the risk of duplication of efforts in creating capabilities, systems, or information that already exist elsewhere in the enterprise.

Design is done in conjunction with understanding needs and requirements. Business architecture provides the context to analyze the strategic alignment of proposed changes and the effects those changes have upon each other. Business architects synthesize knowledge and insights from multiple architectural views to determine if proposed changes work towards or conflict with the organization's goals.

Business architecture attempts to ensure that the enterprise as a whole continues to deliver value to stakeholders both during normal operations and during change. Business analysts working in the discipline of business architecture focus on the value provided by the organization from a holistic view. They attempt to avoid local optimization where effort and resources are put into a single process or system improvement which does not align with the strategy and garners no meaningful impact to the enterprise as a whole—or worse, sub-optimizes the whole.

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BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Backlog Management (p. 220)
- Balanced Scorecard (p. 223)
- Benchmarking and Market Analysis (p. 226)
- Brainstorming (p. 227)
- Business Capability Analysis (p. 230)
- Business Model Canvas (p. 236)
- Business Rules Analysis (p. 240)
- Collaborative Games (p. 243)
- Data Dictionary (p. 247)
- Data Flow Diagrams (p. 250)
- Data Modelling (p. 256)
- Decision Analysis (p. 261)
- Document Analysis (p. 269)
- Estimation (p. 271)
- Focus Groups (p. 279)
- Functional Decomposition (p. 283)
- Glossary (p. 286)
- Interface Analysis (p. 287)
- Item Tracking (p. 294)
- Lessons Learned (p. 296)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Non-Functional Requirements Analysis (p. 302)
- Observation (p. 305)
- Organizational Modelling (p. 308)
- Process Analysis (p. 314)
- Process Modelling (p. 318)
- Prototyping (p. 323)
- Reviews (p. 326)
- Risk Analysis and Management (p. 329)
- Roles and Permissions Matrix (p. 333)
- Root Cause Analysis (p. 335)
- Scope Modelling (p. 338)
- Sequence Diagrams (p. 341)
- Stakeholder List, Map, or Personas (p. 344)
- State Modelling (p. 348)
- Survey or Questionnaire (p. 350)
- SWOT Analysis (p. 353)
- Use Cases and Scenarios (p. 356)
- User Stories (p. 359)
- Vendor Assessment (p. 361)
- Workshops (p. 363)

Other Business Analysis Techniques

- Archimate®
- Business Process Architecture
- Capability Map
- Customer Journey Map
- Enterprise Core Diagram
- Project Portfolio Analysis
- Roadmap
- Service-oriented Analysis
- Value Mapping

.6 Solution Evaluation

Business architecture asks fundamental questions about the business, including

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the important question of how well the business is performing.

To answer this question, several other questions must be answered:

- What outcomes are the business, a particular initiative, or component expecting to achieve?
- How can those outcomes be measured in terms of SMART (Specific, Measurable, Achievable, Relevant, Time-bounded) objectives?
- What information is needed to measure those objectives?
- How do processes, services, initiatives, etc. need to be instrumented to collect that information?
- How is the performance information best presented in terms of reports, ad hoc queries, dashboards, etc.?
- How do we use this information to make investment decisions in the future?

For example, at a more detailed level, an important part of capability definition and process architecture is to identify the specific performance characteristics and outcome that those capabilities or processes are expected to achieve. The actual measurement is rarely conducted by business analysts. It is usually done by business owners, operational, or information technology managers.

Business analysts working in the discipline of business architecture analyze the results of measurements and factor these results into subsequent planning.

BABOK® Guide Techniques

- Balanced Scorecard (p. 223)
- Benchmarking and Market Analysis (p. 226)
- Brainstorming (p. 227)
- Business Capability Analysis (p. 230)
- Collaborative Games (p. 243)
- Focus Groups (p. 279)
- Item Tracking (p. 294)
- Lessons Learned (p. 296)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Observation (p. 305)
- Organizational Modelling (p. 308)
- Process Analysis (p. 314)
- Process Modelling (p. 318)
- Risk Analysis and Management (p. 329)
- Roles and Permissions Matrix (p. 333)
- Root Cause Analysis (p. 335)
- Stakeholder List, Map, or Personas (p. 344)
- Survey or Questionnaire (p. 350)
- SWOT Analysis (p. 353)

Other Business Analysis Techniques

- Business Motivation Modelling
- Business Process Architecture
- Capability Map
- Customer Journey Map
- Service-oriented Analysis
- Value Mapping

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11.5 The Business Process Management Perspective

The Business Process Management Perspective highlights the unique characteristics of business analysis when practiced in the context of developing or improving business processes.

Business Process Management (BPM) is a management discipline and a set of enabling technologies that:

- focuses on how the organization performs work to deliver value across multiple functional areas to customers and stakeholders,
- aims for a view of value delivery that spans the entire organization, and
- views the organization through a process-centric lens.

A BPM initiative delivers value by implementing improvements to the way work is performed in an organization.

BPM determines how manual and automated processes are created, modified, cancelled, and governed. Organizations that hold a process-centric view treat BPM as an ongoing effort and an integral part of the ongoing management and operation of the organization.

11.5.1 Change Scope

Business analysts working within the BPM discipline may address a single process with limited scope or they may address all of the processes in the organization. Business analysts frequently focus on how the processes of an organization can be changed in order to improve and meet the objectives of the organization.

BPM life cycles generally include the following activities:

- **Designing**: the identification of processes and definition of their current state (as-is) and determining how we get to the future state (to-be). The gap between these states may be used to specify stakeholders' expectations of how the business should be run.
- **Modelling**: the graphical representation of the process that documents the process as well as comparing current state (as-is) and future state (to-be). This phase of the BPM life cycle provides input to requirements and solution design specification, as well as analyzing their potential value. Simulation may use quantitative data so that the potential value of variations on the process can be analyzed and compared.
- **Execution and Monitoring**: provides the same type of input as modelling but in terms of the actual execution of processes. The data collected as a result of the actual business process flow is very reliable and objective which makes it a very strong asset in analyzing value and recommending alternatives for design improvement.
- **Optimizing**: the act of ongoing repetition or iteration of the previous phases. The results of business process execution and monitoring are utilized to modify models and designs so that all inefficiencies are removed

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and more value is added. Optimization may be a source of requirements and solution design definitions that comes directly from stakeholders and the user community. Optimization of processes is also a good way to demonstrate the value of a suggested solution modification, and justify process and product improvement initiatives.

.1 Breadth of Change

The goal of BPM is to ensure that value delivery is optimized across end-to-end processes. A comprehensive BPM initiative can span the entire enterprise. A single BPM initiative can make an organization become more process-centric by providing insights into its processes. An organization's processes define what the organization does and how it does it. Possessing a thorough understanding of its processes allows stakeholders to adjust these processes to meet the evolving needs of both the organization and its customers.

Individual initiatives may improve specific processes and sub-processes. Breaking down larger, more complex processes into smaller chunks (sub-processes) allows business analysts to better understand what each process is doing and how to optimize them.

.2 Depth of Change

Business analysts use BPM frameworks to facilitate the analysis and deep understanding of the organization's processes. BPM frameworks are sets or descriptions of processes for a generic organization, specific industry, professional area, or type of value stream. BPM frameworks define particular levels of processes throughout the organization's process architecture.

As an example, business analysts perform supply chain analysis as a means of evaluating specific processes in an organization. Analysis of the supply chain is frequently conducted by decomposing group-level processes into individual sub-components and then decomposing these down to individuals performing specific tasks.

Business analysts involved with business process management are frequently engaged in continuous improvement activities as they are often the ones most familiar with BPM.

.3 Value and Solutions Delivered

The goal of BPM is to improve operational performance (effectiveness, efficiency, adaptability, and quality) and to reduce costs and risks. Business analysts frequently consider transparency into processes and operations as a common core value of BPM initiatives. Transparency into processes and operations provides decision makers a clear view of the operational consequences of previous process related decisions. Business analysis efforts frequently begin with the identification of the business need of the customers. Needs are generally referred to as BPM drivers. BPM drivers include:

- cost reduction initiatives,
- increase in quality,

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- increase in productivity,
- emerging competition,
- risk management,
- compliance initiatives,
- next generation process automation,
- core system implementation,
- innovation and growth,
- post merger and acquisition rationalization,
- standardization initiatives,
- major transformation programs,
- establishment of a BPM Centre of Excellence,
- increased agility, and
- speed or faster processes.

.4 Delivery Approach

The delivery approach for BPM initiatives across organizations ranges from a set of tactical methods focused on improving individual processes to a management discipline that touches all the processes in an organization. The main purpose of process transformation is to help organizations identify, prioritize, and optimize their business processes to deliver value to stakeholders.

Organizations conduct periodic assessments of key processes and engage in ongoing continuous improvement to achieve and sustain process excellence. The success of BPM can be measured by how well the BPM initiative aligns to the objectives set for BPM in the organization.

There are several mechanisms that can be used to implement BPM:

- **Business process re-engineering**: methods that aim for major process redesign across the enterprise.
- **Evolutionary forms of change**: methods that have overall objectives set for the process and then individual changes aimed at bringing sub-processes in line with those goals are implemented.
- **Substantial discovery**: methods are used when organizational processes are undefined or if the documented version of the process is substantially different from the actual process in use. Substantial discovery is about revealing actual processes and is a method for organizational analysis.
- **Process benchmarking**: compares an organization's business processes and performance metrics to industry best practices. Dimensions typically measured are quality, time, and cost.
- **Specialized BPMS applications**: are designed to support BPM initiatives and execute the process models directly. These applications are tools that

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automate BPM activities. Often the organization's processes are required to be changed to match the automated approach.

Process improvement approaches can be categorized in terms of their point of origin and whether their solutions are primarily organizational (people-based) or technological (IT-based). Organizations can better understand the process improvement methodology, as mentioned in the previous paragraph, to apply based on the following organizing principles:

- **Top-down**: initiatives are typically orchestrated from a central point of control by senior management and have organization spanning implications, targeted at end-to-end processes or major parts of the business.
- **Bottom-up**: initiatives are typically tactical approaches to improving individual processes and departmental workflows, or sub-processes in smaller parts of the organization.
- **People-centric**: initiatives where the principal change is to the activities and workflows in an organization.
- **IT-centric**: initiatives frequently focused on process automation.

.5 Major Assumptions

The following is a list of major assumptions from the BPM discipline:

- Processes are generally supported by information technology systems, but the development of those systems is not covered by most BPM methods. Business analysts may suggest additional business requirements based on existing IT systems.
- BPM initiatives have senior management support. The business analyst may be involved in suggesting additional business requirements based on organizational strategies.
- BPM systems require a tight integration with organizational strategy but most methods do not tackle the development of strategy which is outside the scope of this perspective.
- BPM initiatives are cross-functional and end-to-end in the organization.

11.5.2 Business Analysis Scope

.1 Change Sponsor

Enterprise-wide BPM initiatives are typically started by executives focusing on value and outcomes and then linking these strategic objectives to the corresponding business processes which most closely support the objectives.

BPM initiatives are frequently triggered by an external situation which generates a business need. Enterprise business analysis practices are applied to develop a business case for a BPM initiative.

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Process improvements are typically initiated or at least managed by a process manager at any level of the organization. The scope of the process or sub-process usually determines the authority of the process manager.

.2 Change Targets

The possible primary change targets for a BPM initiative include:

- **Customer**: the key stakeholder in any BPM initiative. The principal focus is on the external customer but internal customers are also considered. Since BPM is customer-centric by nature, the customer is part of BPM initiatives in order to validate the effectiveness of the process change. Involving the customer early in the initiative minimizes the risk of failure by ensuring the goals of process delivery are aligned to the customer's expectations.
- **Regulator**: a stakeholder in any BPM initiative due to evolving requirements towards compliance and risk management by some organizations. Regulators may trigger a BPM initiative due to changes in regulations on such concerns as public safety, transparency, equal opportunity, and non-discrimination.
- **Process Owner**: the key stakeholder in any BPM initiative and has the responsibility and authority to make the final decision regarding any changes to the affected processes. The process owner is also responsible for measuring the process performance.
- **Process Participants**: stakeholders who directly or indirectly participate in the process being evaluated. These participants define the activities of the process. In order to ensure that the interests of process participants are met, the process owner engages them during design of the process.
- **Project Manager**: manages the BPM initiative and is accountable for its delivery and driving decisions. The project manager works with a team including process analysts, process owners, and process designers. The project manager is responsible for planning, scheduling, communication management, change management, and risk management.
- **Implementation Team**: converts the plans of the BPM initiative into functioning business processes. The success of a BPM initiative is the ability to integrate all the functions that meet the needs of the customer.

.3 Business Analysis Position

Business analysts working within the discipline of business process management may assume a variety of roles:

- **Process Architect**: responsible for modelling, analyzing, deploying, monitoring, and continuously improving business processes. A process architect knows how to design business processes and how to enhance those processes either manually or for automated business process execution on a BPM platform. Process architects address and guide the decisions around what process knowledge, methodology, and technology is required to meet the objectives of the organization with respect to a

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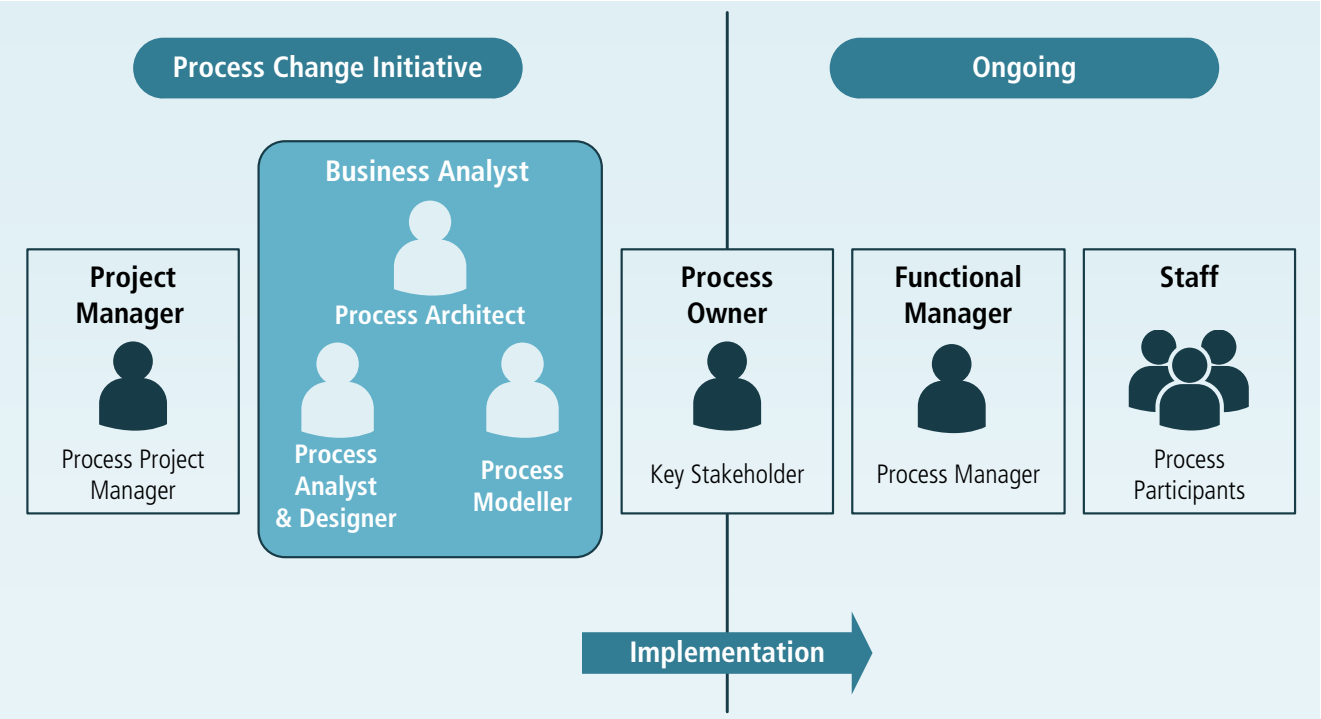
particular BPM initiative. Process architects enhance and transform business processes into technically enhanced and executable process templates. Depending on the BPM initiative, process architects may be focused on managing business performance or on mapping technology to business operations. Process architects are responsible for developing and maintaining standards and the repository of reference models for products and services, business processes, key performance indicators (KPIs), and critical success factors (CSF). They are engaged in process analysis and transformation initiatives.

- **Process Analyst/Designer**: has detailed process knowledge, skills, and interest. They are experts in documenting and understanding process design along with performance trends. Process analysts/designers have an interest in business process optimization to increase overall business performance. This goal requires an understanding of the detailed process and includes performing the necessary analysis for process optimization. They perform analysis and assessment of as-is processes, evaluate alternate process design options, and make recommendations for change based on various frameworks.
- **Process Modeller**: captures and documents business (both the as-is and to-be) processes. The process modeller is frequently a process analyst working to document a process for implementation or support by an information technology system.

The process analyst/designer and the process modeller functions frequently reside within a single position.

Figure 11.5.1: Business Analyst Roles in a BPM Initiative



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.4 Business Analysis Outcomes

Outcomes for business analysts working within the discipline of business process management include:

- business process models,
- business rules,
- process performance measures,
- business decisions, and
- process performance assessment.

Business Process Models

Business process models start at the highest level as an end-to-end model of the whole process and can become as specific as modelling specific work flow. Business process models serve as both an output and a starting point for the analysis of the process. They are divided into current state (as-is) and future state (to-be) models. Current state models portray the process as it currently functions, without any improvements. The future state model envisions what the process would look like if all improvement options are incorporated. The benefit of developing the current state model is to justify the investment in the process by enabling the business analyst to measure the effect of the process improvements and prioritize changes to the process. Transition models describe the interim states required to move from the current state process to the future state process.

Business Rules

Business rules guide business processes and are intended to assert business structure or control the behaviour of business. Business rules are identified during requirements elicitation and process analysis and often focus on business calculations, access control issues, and policies of an organization. Classifying business rules can help decide how they will be best implemented. Business rules analysis provides insight into how the business functions and how the processes contribute to meeting the business' goals and objectives. Business analysts analyze the reasons for the existence of a business rule and study its impact on the business process before improving or redesigning it. Business rules may, where appropriate, be mapped to individual processes through the decisions they influence unless they are related strictly to the performance of the process.

Process Performance Measures

Process performance measures are parameters that are used to identify process improvement opportunities. Process performance measures are defined and deployed to ensure that processes are aligned to the business needs and strategic objectives of the organization. Process performance measures can address many aspects of a process including quality, time, cost, agility, efficiency, effectiveness, responsiveness, adaptability, flexibility, customer satisfaction, velocity, variability, visibility, variety, rework, and volume. Many of the process performance measures seek to measure the effectiveness and efficiency of the process as well as the degree to which the process goals are achieved. When deployed across the

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business, process performance measures can indicate the maturity level of process culture in an organization and generate a shared understanding of process performance across an organization. Performance measures are keys to defining service level agreements where an organization provides service to their customers.

Business Decisions

Business decisions are a specific kind of task or activity in a business process that determine which of a set of options will be acted upon by the process. Decisions must be made (using a task or activity) and then acted upon (often with a gateway or branch in the process). Decisions may be manual or automated, are modelled independently, and are best described using business rules. Decision rules, often implemented through a business rules engine, allow these business decisions to be automated.

Process Performance Assessment

The success of any BPM initiative rests on the intention and capability to continuously measure and monitor the performance of targeted business processes. The assessment can be static and be documented with assessment reports and scorecards, or dynamic and be delivered through dashboards. It provides necessary information to decision makers in an organization to redeploy and adjust resources in order to meet process performance goals.

11.5.3 Frameworks, Methodologies, and Techniques

.1 Frameworks

The following table lists frameworks that are commonly used within the discipline of business process management.

BPM Frameworks

Framework	Brief description
ACCORD	A methodological framework that maps current state models, as well as unstructured data, to conceptual models.
Enhanced Telecommunications Operations Map (eTOM)	A hierarchical framework developed for the telecommunications industry that has been adopted by other service-oriented industries.
Governments Strategic Reference Model (GSRM)	A life cycle framework that provides generic government processes and patterns for each stage of organizational maturity.
Model based and Integrated Process Improvement (MIPI)	A cyclical framework whose steps include assess readiness, outline process under review, detail data collection, form model of current process, assess and redesign process, implement improved process, and review process.

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BPM Frameworks (Continued)

Framework	Brief description
Process Classification Framework(PCF)	A classification framework that details processes and is used for benchmarking and performance measurement.

.2 Methodologies

The following table lists methodologies that are commonly used within the discipline of business process management.

Table 11.5.1: BPM Methodologies

Methodology	Brief description
Adaptive Case Management (ACM)	A method used when processes are not fixed or static in nature, and have a lot of human interaction. An ACM process may be different each time it is performed.
Business Process Re-engineering (BPR)	The fundamental rethinking and redesigning of business processes to generate improvements in critical performance measures, such as cost, quality, service, and speed.
Continuous Improvement (CI)	The ongoing monitoring and adjustment of existing processes to bring them closer to goals or performance targets. This represents a permanent commitment of the organization to change and must be an important part of its culture.
Lean	A continuous improvement methodology that focuses on the elimination of waste in a process, defined as work for which the customer of the process will not pay.
Six Sigma	A continuous improvement methodology that focuses on the elimination of variations in the outcome of a process. It is statistically oriented and performance data centric.
Theory Of Constraints (TOC)	A methodology that holds the performance of an organization can be optimized by managing three variables: the throughput of a process, operational expense to produce that throughput, and the inventory of products. The performance of a process is dominated by one key constraint at any given time, and the process can only be optimized by improving the performance of that constraint.

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Table 11.5.1: BPM Methodologies (Continued)

Methodology	Brief description
Total Quality Management (TQM)	A management philosophy that holds to the underlying principle that the processes of the organization should provide the customer and stakeholders, both internal and external, with the highest quality products and services, and that these products or services meet or exceed the customers' and stakeholders' expectations.

.3 Techniques

The following table lists techniques, not included in the Techniques chapter of the *BABOK® Guide* and are commonly used within the discipline of BPM.

Table 11.5.2: BPM Techniques

Technique	Brief Description
Cost Analysis	A list of the cost per activity totaled to show the detailed cost of the process and is used frequently by businesses to gain an understanding and appreciation of the cost associated with a product or service. Cost analysis is also known as activity based costing.
Critical to Quality (CTQ)	A set of diagrams, in the form of trees, that assist in aligning process improvement efforts to customer requirements. CTQ is a technique used in Six Sigma, but is not exclusive to Six Sigma.
Cycle-time Analysis	An analysis of the time each activity takes within the process. Cycle-time analysis is also known as a duration analysis.
Define Measure Analyze Design Verify (DMADV)	A data-driven structured roadmap used to develop new or improve existing processes. DMADV is a technique used in Six Sigma, but is not exclusive to Six Sigma.
Define Measure Analyze Improve Control (DMAIC)	A data-driven structured roadmap used to improve processes. DMAIC is a technique used in Six Sigma, but is not exclusive to Six Sigma.
Drum-Buffer-Rope (DBR)	A method used to ensure that the system constraint always functions at the maximum possible output, by ensuring that there is a sufficient buffer of materials just prior to the constraint to keep it continuously busy. It can be used in BPM to ensure process efficiency.
Failure Mode and Effect Analysis (FMEA)	A systematic method of investigating process failures and defects, and identifying potential causes. FMEA is a technique that assists in locating problems in the as-is process and correcting them when developing the to-be processes.

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Table 11.5.2: BPM Techniques (Continued)

Technique	Brief Description
House of Quality/ Voice of Customer	A matrix relating customer desires and product characteristics to the capabilities of an organization. It is a technique that could be used in developing the to-be processes.
Inputs, Guide, Outputs, Enablers (IGOE)	A diagram that describes the context of a process, by listing the inputs and outputs of the process, the guides that are used to inform the execution of the process, and the supporting tools and information required for the process.
Kaizen Event	A focused, rapid effort to improve value delivery in one specific activity or sub-process.
Process Simulation	A model of the process and a set of randomized variables to allow for multiple variations of a process to be assessed and develop an estimate of their performance under actual conditions.
Suppliers Inputs Process Outputs Customers (SIPOC)	A table that summarizes inputs and outputs from multiple processes. Also known as COPIS, which is simply SIPOC spelled backwards.
Theory of Constraints (TOC) Thinking Processes	A set of logical cause-and-effect models used to diagnose conflicts, identify the root causes of problems, and define future states of a system that successfully resolve those root causes. TOC thinking processes is a technique that assists in locating problems in the as-is process and correcting them when developing the to-be processes.
Value Added Analysis	Looks at the benefit to the customer added at each step of a process to identify opportunities for improvement.
Value Stream Analysis	Used to assess the value added by each functional area of a business to the customer, as part of an end-to-end process.
Who What When Where Why (5Ws)	A set of questions that form the foundation for basic information gathering. The 5Ws may also include How added to become the 5Ws and a H.

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11.5.4 Underlying Competencies

Business analysts working within the discipline of business process management are required to challenge the status quo, dig to understand the root causes of a problem, assess why things are being done in a particular way, and encourage subject matter experts (SMEs) to consider new ideas and approaches to make their processes more efficient and effective. They are also required to understand, articulate, and move back and forth between internal and external views of the processes under analysis.

Due to the effects that changes to processes have on the working habits of individuals, interaction skills are valuable in a BPM initiative. Business analysts frequently negotiate and arbitrate between individuals with different opinions, and expose and resolve conflicts between different groups within the organization. The business analyst is a neutral and independent facilitator of the change.

BPM initiatives are likely to involve all levels of the organization and the business analyst is required to communicate across organizational boundaries as well as outside the organization.

11.5.5 Impact on Knowledge Areas

This section explains how specific business analysis practices within business process management are mapped to business analysis tasks and practices as defined by the *BABOK® Guide*. This section also describes how each knowledge area is applied or modified within the business process management discipline.

Each knowledge area lists techniques relevant to a business process management perspective. *BABOK® Guide* techniques are found in the Techniques chapter of the *BABOK® Guide*. Other business analysis techniques are not found in the chapter, but are considered to be particularly useful to business analysts working in the discipline of business process management. This is not intended to be an exhaustive list of techniques but rather to highlight the types of techniques used by business analysts while performing the tasks within the knowledge area.

.1 Business Analysis Planning and Monitoring

Progressive elaboration is common in the planning of BPM initiatives due to the fact that the amount of information available for full planning may be limited in the initial stages. BPM initiatives involve continuous improvement activities, and a common cause of failure of BPM initiatives is the failure to plan for ongoing monitoring of the effect of changes to the process. In BPM initiatives, the initial focus of business analysis work is on analyzing and improving the business process before looking at the technology used to support the process, and any changes that might be required to software applications or work procedures.

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BABOK® Guide Techniques

- Estimation (p. 271)
- Item Tracking (p. 294)
- Process Modelling (p. 318)
- Reviews (p. 326)
- Stakeholder List, Map, or Personas (p. 344)
- Workshops (p. 363)

Other Business Analysis Techniques

- Inputs, Guide, Outputs, Enablers (IGOE)

.2 Elicitation and Collaboration

For the BPM initiative to be successful, the scope of the initiative and the scope of the affected process must be defined and understood.

Process modelling and stakeholder analysis are generally utilized during the elicitation phase of a BPM initiative. During elicitation, the business analyst focuses on cause and effect of both changing existing processes and keeping the processes as they are through the elicitation and collaboration effort. As an existing process is changed, the effect of any process improvements identified on the organization, people, and technology are considered. Process maps are an important tool to drive elicitation in BPM initiatives and stakeholders are frequently consulted during their development. Effective elicitation and collaboration is critical in process modelling analysis and design work.

Process changes can have significant impacts across the organization, so managing stakeholders and their expectations is particularly critical. Without effective stakeholder management, process changes may not be successfully implemented or the changes may not meet the organization's goals and objectives.

BABOK® Guide Techniques

- Brainstorming (p. 227)
- Document Analysis (p. 269)
- Focus Groups (p. 279)
- Interface Analysis (p. 287)
- Interviews (p. 290)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Observation (p. 305)
- Process Modelling (p. 318)
- Prototyping (p. 323)
- Reviews (p. 326)
- Root Cause Analysis (p. 335)
- Scope Modelling (p. 338)
- Stakeholder List, Map, or Personas (p. 344)
- Survey or Questionnaire (p. 350)
- Use Cases and Scenarios (p. 356)
- User Stories (p. 359)
- Workshops (p. 363)

Other Business Analysis Techniques

- House of Quality/Voice of Customer

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.3 Requirements Life Cycle Management

BPM is a set of approaches that focus on ways to deliver value across multiple functional areas through a process-centric lens. Delivering additional value is often related to deliberately undertaking change but could also result from an ad hoc request or review of processes. The impact of BPM activities on requirements life cycle management is significant as it can drive out business requirements resulting in new design, coding, implementation, and post-implementation changes. It is the responsibility of the business analyst to maintain this connection and ensure that communication is effectively conducted with stakeholders and process owners who are the ultimate decision makers when it is about processes, change, and supporting solutions.

The documentation of business processes is available to all stakeholders as it is to be used in the daily operation of the business. If the process is automated through a BPMS, the representation of the process may be directly executable.

BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Backlog Management (p. 220)
- Brainstorming (p. 227)
- Business Rules Analysis (p. 240)
- Non-Functional Requirements Analysis (p. 302)
- Prioritization (p. 311)
- Process Analysis (p. 314)
- Process Modelling (p. 318)
- Prototyping (p. 323)
- Scope Modelling (p. 338)
- Workshops (p. 363)

Other Business Analysis Techniques

- none

.4 Strategy Analysis

In a BPM context, strategy analysis involves understanding the role the process plays in an enterprise value chain. At a minimum, any process that interacts with the processes affected by the initiative must be considered.

The current state is likely to be described by the as-is value chain and the current performance measures for the business process. The future state will be described by the to-be value chain and target performance measures. Continuous improvement methods may simply focus on the performance measures to determine the strategy. The change strategy will involve the identification of possible process changes.

BABOK® Guide Techniques

- Document Analysis (p. 269)
- Functional Decomposition (p. 283)
- Interviews (p. 290)
- Lessons Learned (p. 296)
- Process Analysis (p. 314)
- Process Modelling (p. 318)

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Other Business Analysis Techniques

- Drum-Buffer-Rope
- House of Quality/Voice of Customer
- Inputs, Guide, Outputs, Enablers (IGOE)
- TOC Thinking Processes

.5 Requirements Analysis and Design Definition

Requirements analysis and design definition will focus on defining the to-be process model. The requirements architecture is likely to include the process model, associated business rules and decisions, information requirements, and the organizational structure. Solution options typically include changes to IT needed to support the process, outsourcing of aspects of the process, and similar changes.

BABOK® Guide Techniques

- Benchmarking and Market Analysis (p. 226)
- Business Rules Analysis (p. 240)
- Decision Modelling (p. 265)
- Estimation (p. 271)
- Functional Decomposition (p. 283)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Prioritization (p. 311)
- Prototyping (p. 323)
- Scope Modelling (p. 338)
- Stakeholder List, Map, or Personas (p. 344)
- Workshops (p. 363)

Other Business Analysis Techniques

- Kaizen Event
- Process Simulation

.6 Solution Evaluation

Solution evaluation typically occurs repeatedly during BPM initiatives in order to assess the performance of the business process. As processes are evaluated for different scenarios, they can be refined and the results are monitored. Solution evaluation tasks provide insight into the understanding of the impact of process improvements and the value delivered by business process change. The solution may also involve process mining which uses such techniques as audit trails or transaction logs to obtain process details.

The analyze solution performance task is performed to understand the differences between potential value and actual value. This analysis is performed to discover why there is a variance between potential and actual value, to determine if a solution can perform better or realize more value. The evaluation examines opportunities or constraints of the implemented solution, how it satisfies needs, or how it could be improved. This may trigger further optimization of the process and a repeat of the BPM life cycle.

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BABOK® Guide Techniques

- Acceptance and Evaluation Criteria (p. 217)
- Balanced Scorecard (p. 223)
- Benchmarking and Market Analysis (p. 226)
- Brainstorming (p. 227)
- Business Capability Analysis (p. 230)
- Business Rules Analysis (p. 240)
- Decision Analysis (p. 261)
- Document Analysis (p. 269)
- Estimation (p. 271)
- Interviews (p. 290)
- Metrics and Key Performance Indicators (KPIs) (p. 297)
- Observation (p. 305)
- Organizational Modelling (p. 308)
- Process Modelling (p. 318)
- Reviews (p. 326)
- Risk Analysis and Management (p. 329)
- Root Cause Analysis (p. 335)
- Stakeholder List, Map, or Personas (p. 344)
- Survey or Questionnaire (p. 350)
- SWOT Analysis (p. 353)

Other Business Analysis Techniques

- Kaizen Event
- Failure Mode and Effect Analysis (FMEA)
- Process Simulation
- Value Stream Analysis

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Appendix A: Glossary

a

acceptance criteria: Criteria associated with requirements, products, or the delivery cycle that must be met in order to achieve stakeholder acceptance.

actor (business analysis): A human, device, or system that plays some specified role in interacting with a solution.

adaptive approach: An approach where the solution evolves based on a cycle of learning and discovery, with feedback loops which encourage making decisions as late as possible.

Agile Extension to the *BABOK® Guide*: A standard on the practice of business analysis in an agile context. The *Agile Extension to the BABOK® Guide* version 1 was published in 2013 by IIBA®, in partnership with the Agile Alliance.

allocation: See *requirements allocation*.

architecture: The design, structure, and behaviour of the current and future states of a structure in terms of its components, and the interaction between those components. See also *business architecture*, *enterprise architecture*, and *requirements architecture*.

artifact (business analysis): Any solution-relevant object that is created as part of business analysis efforts.

assumption: An influencing factor that is believed to be true but has not been confirmed to be accurate, or that could be true now but may not be in the future.

b

behavioural business rule: A business rule that places an obligation (or prohibition) on conduct, action, practice, or procedure; a business rule whose purpose is to shape (govern) day-to-day business activity. Also known as operative rule.

benchmarking: A comparison of a decision, process, service, or system's cost, time, quality, or other metrics to those of leading peers to identify opportunities for improvement.

body of knowledge: The aggregated knowledge and generally accepted practices on a topic.

BPM: See *business process management*.

brainstorming: A team activity that seeks to produce a broad or diverse set of options through the rapid and uncritical generation of ideas.

business (business analysis): See *enterprise*.

business (business world): An economic system where any commercial, industrial, or professional activity is performed for profit.

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business analysis: The practice of enabling change in the context of an enterprise by defining needs and recommending solutions that deliver value to stakeholders.

business analysis information: Any kind of information at any level of detail that is used as an input to business analysis work, or as an output of business analysis work.

business analysis package: A document, presentation, or other collection of text, matrices, diagrams and models, representing business analysis information.

business analyst: Any person who performs business analysis, no matter their job title or organizational role. For more information, see Who is a Business Analyst? (p. 2).

business analysis approach: The set of processes, rules, guidelines, heuristics, and activities that are used to perform business analysis in a specific context.

business analysis communication plan: A description of the types of communication the business analyst will perform during business analysis, the recipients of those communications, and the form and frequency of those communications.

business analysis effort: The scope of activities a business analyst is engaged in during the life cycle of an initiative.

business analysis plan: A description of the planned activities the business analyst will execute in order to perform the business analysis work involved in a specific initiative. See also *requirements management plan*.

business architecture: The design, structure, and behaviour of the current and future states of an enterprise to provide a common understanding of the organization. It is used to align the enterprise's strategic objectives and tactical demands.

business case: A justification for a course of action based on the benefits to be realized by using the proposed solution, as compared to the cost, effort, and other considerations to acquire and live with that solution.

business decision: A decision that can be made based on strategy, executive judgment, consensus, and business rules, and that is generally made in response to events or at defined points in a business process.

business domain: See *domain*.

business goal: A state or condition that an organization is seeking to establish and maintain, usually expressed qualitatively rather than quantitatively.

business need: A problem or opportunity of strategic or tactical importance to be addressed.

business objective: An objective, measurable result to indicate that a business goal has been achieved.

business policy: A non-practicable directive that controls and influences the actions of an enterprise.

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business problem: An issue of strategic or tactical importance preventing an enterprise or organization from achieving its goals.

business process: An end-to-end set of activities which collectively responds to an event, and transforms information, materials, and other resources into outputs that deliver value directly to the customers of the process. It may be internal to an organization, or it may span several organizations.

business process management (BPM): A management discipline that determines how manual and automated processes are created, modified, cancelled, and governed.

business process re-engineering: Rethinking and redesigning business processes to generate improvements in performance measures.

business requirement: A representation of goals, objectives and outcomes that describe why a change has been initiated and how success will be assessed.

business rule: A specific, practicable, testable directive that is under the control of the business and that serves as a criterion for guiding behaviour, shaping judgments, or making decisions.

C

capability: The set of activities the enterprise performs, the knowledge it has, the products and services it provides, the functions it supports, and the methods it uses to make decisions.

cause-and-effect diagram: See *fishbone diagram*.

change: The act of transformation in response to a need.

change agent: One who is a catalyst for change.

change control: Controlling changes to requirements and designs so that the impact of requested changes is understood and agreed-to before the changes are made.

change management: Planned activities, tools, and techniques to address the human side of change during a change initiative, primarily addressing the needs of the people who will be most affected by the change.

change strategy: A plan to move from the current state to the future state to achieve the desired business objectives.

change team: A cross-functional group of individuals who are mandated to implement a change. This group may be comprised of product owners, business analysts, developers, project managers, implementation subject matter experts (SMEs), or any other individual with the relevant set of skills and competencies required to implement the change.

checklist (business analysis): A standard set of quality elements that reviewers use for requirements verification.

collaboration: The act of two or more people working together towards a common goal.

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commercial off-the-shelf (COTS): A prepackaged solution available in the marketplace which address all or most of the common needs of a large group of buyers of those solutions. A commercial off-the-shelf solution may require some configuration to meet the specific needs of the enterprise.

competitive analysis: A structured assessment which captures the key characteristics of an industry to predict the long-term profitability prospects and to determine the practices of the most significant competitors.

component: A uniquely identifiable element of a larger whole that fulfills a clear function.

concept model: An analysis model that develops the meaning of core concepts for a problem domain, defines their collective structure, and specifies the appropriate vocabulary needed to communicate about it consistently.

constraint (business analysis): An influencing factor that cannot be changed, and that places a limit or restriction on a possible solution or solution option.

context: The circumstances that influence, are influenced by, and provide understanding of the change.

core concept (business analysis): One of six ideas that are fundamental to the practice of business analysis: Change, Need, Solution, Context, Stakeholder, and Value.

cost-benefit analysis: An analysis which compares and quantifies the financial and non-financial costs of making a change or implementing a solution compared to the benefits gained.

COTS: See *commercial off-the-shelf*.

create, read, update, and delete matrix (CRUD matrix): A two-dimensional matrix showing which user roles have permission to access specific information entities, and to create new records in those entities, view the data in existing records, update or modify the data in existing records, or delete existing records. The same type of matrix can be used to show which processes, instead of users, have the create, read, update and delete rights.

CRUD matrix: See *create, read, update, and delete matrix*.

customer: A stakeholder who uses or may use products or services produced by the enterprise and may have contractual or moral rights that the enterprise is obliged to meet.

d

decision analysis: An approach to decision making that examines and models the possible consequences of different decisions, and assists in making an optimal decision under conditions of uncertainty.

decomposition: A technique that subdivides a problem into its component parts in order to facilitate analysis and understanding of those components.

defect: A deficiency in a product or service that reduces its quality or varies from a desired attribute, state, or functionality.

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definitional business rule: A rule that indicates something is necessarily true (or untrue); a rule that is intended as a definitional criterion for concepts, knowledge, or information. Also known as a structural rule.

deliverable: Any unique and verifiable work product or service that a party has agreed to deliver.

design: A usable representation of a solution. For more information see Key Terms (p. 14) and Requirements and Designs (p. 19).

document analysis (business analysis): An examination of the documentation of an existing system in order to elicit requirements.

domain: The sphere of knowledge that defines a set of common requirements, terminology, and functionality for any program or initiative solving a problem.

domain subject matter expert: A stakeholder with in-depth knowledge of a topic relevant to the business need or solution scope.

DSDM: See *dynamic systems development method*.

dynamic systems development method (DSDM): A project delivery framework which focuses on fixing cost, quality, and time at the beginning while contingency is managed by varying the features to be delivered.

e

elicitation: Iterative derivation and extraction of information from stakeholders or other sources.

end user: A stakeholder who directly interacts with the solution.

enterprise: A system of one or more organizations and the solutions they use to pursue a shared set of common goals.

enterprise architecture: A description of the business processes, information technology, people, operations, information, and projects of an enterprise and the relationships between them.

enterprise readiness assessment: An assessment that describes the enterprise is prepared to accept the change associated with a solution and is able to use it effectively.

entity-relationship diagram: A graphical representation of the entities relevant to a chosen problem domain and the relationships between them.

estimate: A quantitative assessment of a planned outcome, resource requirements, and schedule where uncertainties and unknowns are systematically factored into the assessment.

evaluation: The systematic and objective assessment of a solution to determine its status and efficacy in meeting objectives over time, and to identify ways to improve the solution to better meet objectives. See also *indicator*; *metric*, *monitoring*.

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event (business analysis): An occurrence or incident to which an organizational unit, system, or process must respond.

evolutionary prototype: A prototype that is continuously modified and updated in response to feedback from stakeholders.

experiment: Elicitation performed in a controlled manner to make a discovery, test a hypothesis, or demonstrate a known fact.

external interface: An interaction that is outside the proposed solution. It can be another hardware system, software system, or a human interaction with which the proposed solution will interact.

f

facilitation: The art of leading and encouraging people through systematic efforts toward agreed-upon objectives in a manner that enhances involvement, collaboration, productivity, and synergy.

feasibility study: An evaluation of proposed alternatives to determine if they are technically, organizationally, and economically possible within the constraints of the enterprise, and whether they will deliver the desired benefits to the enterprise.

feature: A distinguishing characteristic of a solution that implements a cohesive set of requirements and which delivers value for a set of stakeholders.

fishbone diagram: A diagramming technique used in root cause analysis to identify underlying causes of an observed problem, and the relationships that exist between those causes. Also known as an Ishikawa or cause-and-effect diagram.

focus group: A group formed to to elicit ideas and attitudes about a specific product, service, or opportunity in an interactive group environment. The participants share their impressions, preferences, and needs, guided by a moderator.

force field analysis: A graphical method for depicting the forces that support and oppose a change. Involves identifying the forces, depicting them on opposite sides of a line (supporting and opposing forces) and then estimating the strength of each set of forces.

functional requirement: A capability that a solution must have in terms of the behaviour and information the solution will manage.

g

gap analysis: A comparison of the current state and desired future state of an enterprise in order to identify differences that need to be addressed.

goal: See *business goal*.

governance process (change): A process by which appropriate decision makers use relevant information to make decisions regarding a change or solution, including the means for obtaining approvals and priorities.

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guideline (business analysis): An instruction or description on why or how to undertake a task.

h

horizontal prototype: A prototype that is used to explore requirements and designs at one level of a proposed solution, such as the customer-facing view or the interface to another organization.

i

impact analysis: An assessment of the effects a proposed change will have on a stakeholder or stakeholder group, project, or system.

implementation subject matter expert: A stakeholder who has specialized knowledge regarding the implementation of one or more solution components.

indicator: A specific numerical measurement that indicates progress toward achieving an impact, output, activity, or input. See also *metric*.

initiative: A specific project, program, or action taken to solve some business problem(s) or achieve some specific change objective(s).

input (business analysis): Information consumed or transformed to produce an output. An input is the information necessary for a task to begin.

inspection: A formal review of a work product by qualified individuals that follows a predefined process, and uses predefined criteria, for defect identification and removal.

interface: A shared boundary between any two persons and/or systems through which information is communicated.

interoperability: Ability of systems to communicate by exchanging data or services.

interview: Eliciting information from a person or group of people in an informal or formal setting by asking relevant questions and recording the responses.

Ishikawa diagram: See *fishbone diagram*.

iteration (business analysis): A single instance of progressive cycles of analysis, development, testing, or execution.

k

knowledge area (business analysis): An area of expertise that includes several specific business analysis tasks.

l

lessons learned process: A process improvement technique used to learn about and improve on a process or project. A lessons learned session involves a special meeting in which the team explores what worked, what didn't work, what could be learned from the just-completed iteration, and how to adapt processes and techniques before continuing or starting anew.

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life cycle: A series of changes an item or object undergoes from inception to retirement

m

matrix: A textual form of modelling used to represent information that can be categorized, cross-referenced, and represented in a table format.

metadata: A description of data to help understand how to use that data, either in terms of the structure and specification of the data, or the description of a specific instance of an object.

methodology: A body of methods, techniques, procedures, working concepts, and rules used to solve a problem

metric: A quantifiable level of an indicator measured at a specified point in time.

mission statement: A formal declaration of values and goals that expresses the core purpose of the enterprise.

model: A representation and simplification of reality developed to convey information to a specific audience to support analysis, communication, and understanding.

monitoring: Collecting data on a continuous basis from a solution in order to determine how well a solution is implemented compared to expected results. See also *metric*; *indicator*.

n

need: A problem or opportunity to be addressed.

non-functional requirement: A type of requirement that describes the performance or quality attributes a solution must meet. Non-functional requirements are usually measurable and act as constraints on the design of a solution as a whole.

o

objective: See *business objective*.

observation (business analysis): Studying and analyzing one or more stakeholders in their work environment in order to elicit requirements.

OLAP: See *online analytical processing*.

online analytical processing (OLAP): A business intelligence approach that allows users to analyze large amounts of data from different points of view.

operational support: A stakeholder who is responsible for the day-to-day management and maintenance of a system or product.

operative rule: See *behavioural business rule*.

organization: An autonomous group of people under the management of a single individual or board, that works towards common goals and objectives.

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organizational capability: A function inside the enterprise, made up of components such as processes, technologies, and information and used by organizations to achieve their goals.

organizational change management: See *change management*.

organization modelling: The analysis technique used to describe roles, responsibilities and reporting structures that exist within an enterprise.

organizational unit: Any recognized association of people within an organization or enterprise.

p

peer review: A formal or informal review of a work product to identify errors or opportunities for improvement. See also *inspection*.

plan: A detailed scheme for doing or achieving something usually comprising a set of events, dependencies, expected sequence, schedule, results or outcomes, materials and resources needed, and how stakeholders need to be involved.

policy: See *business policy*.

predictive approach: An approach where planning and baselines are established early in the life cycle of the initiative in order to maximize control and minimize risk.

prioritization: Determining the relative importance of a set of items in order to determine the order in which they will be addressed.

process: A set of activities designed to accomplish a specific objective by taking one or more defined inputs and turning them into defined outputs.

process model: A set of diagrams and supporting information about a process and factors that could influence the process. Some process models are used to simulate the performance of the process.

product (business analysis): A solution or component of a solution that is the result of an initiative.

product backlog: A set of user stories, requirements, or features that have been identified as candidates for potential implementation, prioritized, and estimated.

product scope: See *solution scope*.

product vision statement: A brief statement or paragraph that describes the goals of the solution and how it supports the strategy of the organization or enterprise.

project: A temporary endeavour undertaken to create a unique product, service, or result.

project manager: A stakeholder who is responsible for managing the work required to deliver a solution that meets a business need, and for ensuring that the project's objectives are met while balancing the project constraints,

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including scope, budget, schedule, resources, quality, and risk.

project scope: The work that must be performed to deliver a product, service, or result with the specified features and functions.

proof of concept: A model created to validate the design of a solution without modelling the appearance, materials used in the creation of work, or processes and workflows ultimately used by the stakeholders.

prototype: A partial or simulated approximation of the solution for the purpose of eliciting or verifying requirements with stakeholders.

q

quality: The degree to which a set of inherent characteristics fulfills needs.

quality assurance: A set of activities performed to ensure that a process will deliver products that meet an appropriate level of quality.

quality attributes: A set of measures used to judge the overall quality of a system. See also *non-functional requirements*.

questionnaire: A set of defined questions, with a choice of answers, used to collect information from respondents.

r

RACI matrix: See *responsible, accountable, consulted, and informed matrix*.

regulator: A stakeholder from outside the organization who is responsible for the definition and enforcement of standards.

repository: A real or virtual facility where all information on a specific topic is stored and is available for retrieval.

request for information (RFI): A formal elicitation method intended to collect information regarding a vendor's capabilities or any other information relevant to a potential upcoming procurement.

request for proposal (RFP): A requirements document issued when an organization is seeking a formal proposal from vendors. An RFP typically requires that the proposals be submitted following a specific process and using sealed bids which will be evaluated against a formal evaluation methodology.

request for quote (RFQ): A procurement method of soliciting price and solution options from vendors.

request for tender (RFT): An open invitation to vendors to submit a proposal for goods or services.

requirement: A usable representation of a need.

requirements attribute: A characteristic or property of a requirement used to assist with requirements management.

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requirements allocation: The process of assigning requirements to be implemented by specific solution components.

requirements architecture: The requirements of an initiative and the interrelationships between these requirements.

requirements artifact: A business analysis artifact containing information about requirements such as a diagram, matrix, document or model.

requirements defect: A problem or error in a requirement. Defects may occur because a requirement is poor quality (see *requirements verification*) or because it does not describe a need that, if met, would provide value to stakeholders (see *requirements validation*).

requirements document: See *requirements package*.

requirements life cycle: The stages through which a requirement progresses from inception to retirement.

requirements management: Planning, executing, monitoring, and controlling any or all of the work associated with requirements elicitation and collaboration, requirements analysis and design, and requirements life cycle management.

requirements management plan: A subset of the business analysis plan for a specific change initiative, describing specific tools, activities, and roles and responsibilities that will be used on the initiative to manage the requirements. See *business analysis plan*.

requirements management tool: Special-purpose software that provides support for any combination of the following capabilities: elicitation and collaboration, requirements modelling and/or specification, requirements traceability, versioning and baselining, attribute definition for tracking and monitoring, document generation, and requirements change control.

requirements model: An abstract (usually graphical) representation of some aspect of the current or future state.

requirements package: A specialized form of a business analysis package primarily concerned with requirements. A requirements package may represent a baseline of a collection of requirements.

requirements traceability: The ability for tracking the relationships between sets of requirements and designs from the original stakeholder need to the actual implemented solution. Traceability supports change control by ensuring that the source of a requirement or design can be identified and other related requirements and designs potentially affected by a change are known.

requirements validation: Work done to evaluate requirements to ensure they support the delivery of the expected benefits and are within the solution scope.

requirements verification: Work done to evaluate requirements to ensure they are defined correctly and are at an acceptable level of quality. It ensures the requirements are sufficiently defined and structured so that the solution

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development team can use them in the design, development, and implementation of the solution.

requirements workshop: A structured meeting in which a carefully selected group of stakeholders collaborate to define and/or refine requirements under the guidance of a skilled neutral facilitator.

residual risk: The risk remaining after action has been taken or plans have been put in place to deal with the original risk.

retrospective: See *lessons learned process*.

return on investment (ROI) (business analysis): A measure of the profitability of a project or investment.

responsible, accountable, consulted, and informed matrix (RACI matrix): A tool used to identify the responsibilities of roles or team members and the activities or deliverables in which they will participate, by being responsible (doing the work), accountable (approving the results), consulted (providing input) or informed of the completed item after it has been completed.

RFI: See *request for information*.

RFP: See *request for proposal*.

RFQ: See *request for quote*.

RFT: See *request for tender.*

risk (business analysis): The effect of uncertainty on the value of a change, a solution, or the enterprise. See also *residual risk*.

risk assessment: Identifying, analyzing and evaluating risks.

ROI: See *return on investment*.

root cause: The cause of a problem having no deeper cause, usually one of several possible causes.

root cause analysis: A structured examination of an identified problem to understand the underlying causes.

S

scope: The boundaries of control, change, a solution, or a need.

scope model: A model that defines the boundaries of a business domain or solution.

secondary actor: An actor external to the system under design that supports the execution of a use case.

sequence diagram: A type of diagram that shows objects participating in interactions and the messages exchanged between them.

service (business analysis): The performance of any duties or work for a stakeholder, from the perspective of the stakeholder.

SIPOC: See *suppliers, inputs, process, outputs and customers*.

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SME: See *subject matter expert*.

software engineer: See *developer*.

solution: A specific way of satisfying one or more needs in a context.

solution component: A sub-part of a solution that can be people, infrastructure, hardware, software, equipment, facilities, and process assets or any combination of these sub-parts.

solution option: One possible way to satisfy one or more needs in a context.

solution requirement: A capability or quality of a solution that meets the stakeholder requirements. Solution requirements can be divided into two sub-categories: functional requirements and non-functional requirements or quality of service requirements.

solution life cycle: The stages through which a solution progresses from inception to retirement.

solution scope: The set of capabilities a solution must deliver in order to meet the business need.

SOW: See *statement of work*.

sponsor: A stakeholder who is responsible for initiating the effort to define a business need and develop a solution that meets that need. They authorize the work to be performed and control the budget and scope for the initiative.

stakeholder: A group or individual with a relationship to the change, the need, or the solution.

stakeholder analysis: Identifying and analyzing the stakeholders who may be impacted by the change and assess their impact, participation, and needs throughout the business analysis activities.

stakeholder list: A catalogue of the stakeholders affected by a change, business need, or proposed solution, and a description of their attributes and characteristics related to their involvement in the initiative.

stakeholder proxy (business analyst): The role a business analyst takes when representing the needs of a stakeholder or stakeholder group.

stakeholder requirement: A description of the needs of a particular stakeholder or class of stakeholders that must be met in order to achieve the business requirements. They may serve as a bridge between business requirements and the various categories of solution requirements.

state diagram: An analysis model showing the life cycle of a data entity or class.

stated requirement: A requirement articulated by a stakeholder that has not been analyzed, verified, or validated. Stated requirements frequently reflect the desires of a stakeholder rather than the actual need.

statement of work (SOW): A written description of the services or tasks that are required to be performed.

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strategy: A description of the chosen approach to apply the capabilities of an enterprise in order to reach a desired set of goals or objectives.

strengths, weaknesses, opportunities, and threats analysis (SWOT): An analysis model used to understand influencing factors and how they may affect an initiative. Also known as SWOT analysis.

structural rule: See *definitional business rule*.

subject matter expert (SME): See *domain subject matter expert*; *implementation subject matter expert*.

supplier: A stakeholder outside the boundary of a given organization or organizational unit who provides products or services to the organization and may have contractual or moral rights and obligations that must be considered.

suppliers, inputs, process, outputs, and customers (SIPOC): A tool used to describe relevant high-level elements of a process. May be used in conjunction with process mapping and 'in/out of scope' tools, to provide additional detail.

survey: Collecting and measuring the opinions or experiences of a group of people through a series of questions.

swimlane: A horizontal or vertical section of a process diagram that shows which activities are performed by a particular actor or role.

SWOT analysis: See *strengths, weaknesses, opportunities and threats analysis.*

system: A set of interdependent components that interact in various ways to produce a set of desired outcomes.

t

task (business analysis): A discrete piece of work that may be performed formally or informally as part of business analysis.

technique: A manner, method, or style for conducting a business analysis task or for shaping its output.

temporal event: An event based on time that can trigger the initiation of a process, evaluation of business rules, or some other response.

tester: An individual responsible for determining how to verify that the solution meets the requirements defined by the business analyst, and conducting the verification process.

throw-away prototype: A prototype used to quickly uncover and clarify requirements or designs using simple tools, sometimes just paper and pencil. It is intended to be discarded when the final system has been developed.

time-box: An agreed-upon period of time in which an activity is conducted or a defined deliverable is intended to be produced.

traceability: See *requirements traceability.*

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transition requirement: A requirement that describes the capabilities the solution must have and the conditions the solution must meet to facilitate transition from the current state to the future state, but which are not needed once the change is complete. They are differentiated from other requirements types because they are of a temporary nature.

u

UAT: See *user acceptance test*.

UML®: See *unified modelling language*.

unified modelling language™ A notation specified by the Object Management Group for describing software application structure, behaviour, and architecture. It can also be used for describing business processes and data structures. The most common UML® diagrams used by business analysts are use case diagrams, activity diagrams, state machine diagrams (also known as state diagrams), and class diagrams.

use case: A description of the observable interaction between an actor (or actors) and a solution that occurs when the actor uses the system to accomplish a specific goal.

use case diagram: A type of diagram defined by UML® that captures all actors and use cases involved with a system or product.

user: See *end user*.

user acceptance test (UAT): Assessing whether the delivered solution meets the needs of the stakeholder group that will be using the solution. The assessment is validated against identified acceptance criteria.

user requirement: See *stakeholder requirement*.

user story: A small, concise statement of functionality or quality needed to deliver value to a specific stakeholder.

v

validation (business analysis): The process of checking that a deliverable is suitable for its intended use. See also *requirements validation*.

validated requirement: A requirement that has been reviewed and is determined to support the delivery of the expected benefits, and is within the solution scope.

value (business analysis): The worth, importance, or usefulness of something to a stakeholder in a context.

value stream mapping: A complete, fact-based, time-series representation of the stream of activities required to deliver a product or service.

verification (business analysis): The process of determining that a deliverable or artifact meets an acceptable standard of quality. See also *requirements verification*.

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verified requirement: A requirement that has been reviewed and is determined to be defined correctly, adheres to standards or guidelines, and is at an acceptable level of detail.

vertical prototype: A prototype that is used to drill down into a proposed solution to uncover requirement and design considerations through multiple layers of a solution that are not easily understood or that are not discernible on the surface. It may include interaction between several solution components.

viewpoint: A set of conventions that define how requirements will be represented, how these representations will be organized, and how they will be related.

VSM: See *value stream mapping.*

W

walkthrough: A review in which participants step through an artifact or set of artifacts with the intention of validating the requirements or designs, and to identify requirements or design errors, inconsistencies, omissions, inaccuracies, or conflicts.

WBS: See *work breakdown structure*.

work breakdown structure (WBS): A deliverable-oriented hierarchical decomposition of the work to be executed to accomplish objectives and create the required deliverables. It organizes and defines the total scope of the project.

work product (business analysis): A document or collection of notes or diagrams used by the business analyst during the requirements development process.

Workshop: A facilitated and focused event attended by key stakeholders for the purpose of achieving a defined goal.

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Appendix B: Techniques to Task Mapping

The following table shows each *BABOK® Guide* task in which the technique is included in the Techniques section.

This mapping is provided for reference purposes and does not preclude the creative use of any technique during the application of any other task in which it is not specifically listed.

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10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.1. Acceptance and Evaluation Criteria			5.5. Approve Requirements	6.2. Define Future State	7.1. Specify and Model Requirements 7.2. Verify Requirements 7.3. Validate Requirements 7.6. Analyze Potential Value and Recommend Solution	8.1. Measure Solution Performance 8.2. Analyze Performance Measures 8.3. Assess Solution Limitations
10.2. Backlog Management			5.3. Prioritize Requirements		7.6. Analyze Potential Value and Recommend Solution	
10.3. Balanced Scorecard				6.2. Define Future State 6.4. Define Change Strategy		

10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.4. Benchmarking and Market Analysis		4.2. Conduct Elicitation		6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.5. Define Design Options	8.1. Measure Solution Performance 8.2. Analyze Performance Measures 8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations
10.5. Brainstorming	3.1. Plan Business Analysis Approach 3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance 3.4. Plan Business Analysis Information Management 3.5. Identify Business Analysis Performance Improvements	4.1. Prepare for Elicitation 4.2. Conduct Elicitation		6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.5. Define Design Options 7.6. Analyze Potential Value and Recommend Solution	8.4. Assess Enterprise Limitations

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10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.6. Business Capability Analysis				6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.1. Specify and Model Requirements	
10.7. Business Cases	3.1. Plan Business Analysis Approach		5.3. Prioritize Requirements 5.4. Assess Requirements Changes	6.1. Analyze Current State 6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.6. Analyze Potential Value and Recommend Solution	8.1. Measure Solution Performance
10.8. Business Model Canvas				6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.1. Specify and Model Requirements 7.6. Analyze Potential Value and Recommend Solution	
10.9. Business Rules Analysis	3.2. Plan Stakeholder Engagement	4.2. Conduct Elicitation	5.2. Maintain Requirements 5.4. Assess Requirements Changes		7.1. Specify and Model Requirements	8.3. Assess Solution Limitations

10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.10. Collaborative Games		4.2. Conduct Elicitation 4.5. Manage Stakeholder Collaboration				
10.11. Concept Modelling		4.2. Conduct Elicitation		6.1. Analyze Current State	7.1. Specify and Model Requirements	
10.12. Data Dictionary					7.1. Specify and Model Requirements	
10.13. Data Flow Diagrams			5.2. Maintain Requirements		7.1. Specify and Model Requirements	
10.14. Data Mining		4.1. Prepare for Elicitation 4.2. Conduct Elicitation		6.1. Analyze Current State		8.1. Measure Solution Performance 8.2. Analyze Performance Measures 8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations 8.5. Recommend Actions to Increase Solution Value

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10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.15. Data Modelling		4.2. Conduct Elicitation	5.2. Maintain Requirements		7.1. Specify and Model Requirements 7.4. Define Requirements Architecture	
10.16. Decision Analysis			5.3. Prioritize Requirements 5.4. Assess Requirements Changes 5.5. Approve Requirements	6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.6. Analyze Potential Value and Recommend Solution	8.1. Measure Solution Performance 8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations 8.5. Recommend Actions to Increase Solution Value
10.17. Decision Modelling				6.2. Define Future State	7.1. Specify and Model Requirements	
10.18. Document Analysis	3.1. Plan Business Analysis Approach 3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance	4.1. Prepare for Elicitation 4.2. Conduct Elicitation 4.3. Confirm Elicitation Results	5.2. Maintain Requirements 5.4. Assess Requirements Changes	6.1. Analyze Current State 6.3. Assess Risks	7.3. Validate Requirements 7.5. Define Design Options	8.4. Assess Enterprise Limitations

10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.19. Estimation	3.1. Plan Business Analysis Approach	4.1. Prepare for Elicitation	5.3. Prioritize Requirements 5.4. Assess Requirements Changes	6.4. Define Change Strategy	7.6. Analyze Potential Value and Recommend Solution	
10.20. Financial Analysis	3.1. Plan Business Analysis Approach		5.3. Prioritize Requirements 5.4. Assess Requirements Changes	6.1. Analyze Current State 6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.3. Validate Requirements 7.6. Analyze Potential Value and Recommend Solution	8.5. Recommend Actions to Increase Solution Value
10.21. Focus Groups		4.2. Conduct Elicitation		6.1. Analyze Current State 6.4. Define Change Strategy	7.6. Analyze Potential Value and Recommend Solution	8.1. Measure Solution Performance 8.5. Recommend Actions to Increase Solution Value
10.22. Functional Decomposition	3.1. Plan Business Analysis Approach		5.1. Trace Requirements 5.2. Maintain Requirements	6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.1. Specify and Model Requirements 7.4. Define Requirements Architecture	
10.23. Glossary					7.1. Specify and Model Requirements	

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10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.24. Interface Analysis		4.2. Conduct Elicitation	5.4. Assess Requirements Changes		7.1. Specify and Model Requirements	
10.25. Interviews	3.1. Plan Business Analysis Approach 3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance 3.4. Plan Business Analysis Information Management 3.5. Identify Business Analysis Performance Improvements	4.1. Prepare for Elicitation 4.2. Conduct Elicitation 4.3. Confirm Elicitation Results 4.4. Communicate Business Analysis Information	5.3. Prioritize Requirements 5.4. Assess Requirements Changes	6.1. Analyze Current State 6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.4. Define Requirements Architecture 7.5. Define Design Options 7.6. Analyze Potential Value and Recommend Solution	8.2. Analyze Performance Measures 8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations

10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.26. Item Tracking	3.1. Plan Business Analysis Approach		5.3. Prioritize Requirements	6.1. Analyze Current State	7.2. Verify Requirements	8.3. Assess Solution Limitations
	3.2. Plan Stakeholder Engagement		5.4. Assess Requirements Changes		7.3. Validate Requirements	8.4. Assess Enterprise Limitations
	3.3. Plan Business Analysis Governance		5.5. Approve Requirements			
	3.4. Plan Business Analysis Information Management					
	3.5. Identify Business Analysis Performance Improvements					

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10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.27. Lessons Learned	3.1. Plan Business Analysis Approach 3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance 3.4. Plan Business Analysis Information Management 3.5. Identify Business Analysis Performance Improvements	4.5. Manage Stakeholder Collaboration		6.1. Analyze Current State 6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.5. Define Design Options	8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations
10.28. Metrics and Key Performance Indicators (KPIs)	3.5. Identify Business Analysis Performance Improvements			6.1. Analyze Current State 6.2. Define Future State	7.2. Verify Requirements 7.3. Validate Requirements 7.6. Analyze Potential Value and Recommend Solution	8.1. Measure Solution Performance 8.2. Analyze Performance Measures

10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.29. Mind Mapping	3.2. Plan Stakeholder Engagement 3.4. Plan Business Analysis Information Management	4.1. Prepare for Elicitation 4.2. Conduct Elicitation		6.1. Analyze Current State 6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.5. Define Design Options	
10.30. Non-Functional Requirements Analysis					7.1. Specify and Model Requirements	8.1. Measure Solution Performance
10.31. Observation	3.5. Identify Business Analysis Performance Improvements	4.2. Conduct Elicitation		6.1. Analyze Current State		8.1. Measure Solution Performance 8.2. Analyze Performance Measures 8.4. Assess Enterprise Limitations
10.32. Organizational Modelling	3.3. Plan Business Analysis Governance			6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.1. Specify and Model Requirements 7.4. Define Requirements Architecture	8.4. Assess Enterprise Limitations 8.5. Recommend Actions to Increase Solution Value

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10.33. Prioritization			5.3. Prioritize Requirements			8.5. Recommend Actions to Increase Solution Value
10.34. Process Analysis	3.5. Identify Business Analysis Performance Improvements	4.2. Conduct Elicitation		6.1. Analyze Current State		8.4. Assess Enterprise Limitations 8.5. Recommend Actions to Increase Solution Value
10.35. Process Modelling	3.1. Plan Business Analysis Approach 3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance 3.4. Plan Business Analysis Information Management 3.5. Identify Business Analysis Performance Improvements	4.2. Conduct Elicitation	5.2. Maintain Requirements	6.2. Define Future State 6.4. Define Change Strategy	7.1. Specify and Model Requirements	8.4. Assess Enterprise Limitations
10.36. Prototyping		4.2. Conduct Elicitation		6.2. Define Future State	7.1. Specify and Model Requirements	8.1. Measure Solution Performance

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10.37. Reviews	3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance 3.5. Identify Business Analysis Performance Improvements	4.3. Confirm Elicitation Results 4.4. Communicate Business Analysis Information	5.5. Approve Requirements		7.2. Verify Requirements 7.3. Validate Requirements	
10.38. Risk Analysis and Management	3.2. Plan Stakeholder Engagement 3.5. Identify Business Analysis Performance Improvements	4.1. Prepare for Elicitation 4.5. Manage Stakeholder Collaboration	5.3. Prioritize Requirements 5.4. Assess Requirements Changes	6.1. Analyze Current State 6.3. Assess Risks	7.3. Validate Requirements 7.6. Analyze Potential Value and Recommend Solution	8.2. Analyze Performance Measures 8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations 8.5. Recommend Actions to Increase Solution Value
10.39. Roles and Permissions Matrix						8.4. Assess Enterprise Limitations

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10.40. Root Cause Analysis	3.5. Identify Business Analysis Performance Improvements			6.1. Analyze Current State 6.3. Assess Risks	7.1. Specify and Model Requirements 7.5. Define Design Options	8.2. Analyze Performance Measures 8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations
10.41. Scope Modelling	3.2. Plan Stakeholder Engagement			6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.1. Specify and Model Requirements 7.4. Define Requirements Architecture	
10.42. Sequence Diagrams					7.1. Specify and Model Requirements	
10.43. Stakeholder List, Map, or Personas		4.1. Prepare for Elicitation 4.5. Manage Stakeholder Collaboration			7.1. Specify and Model Requirements	
10.44. State Modelling					7.1. Specify and Model Requirements	

10. Techniques	3. Business Analysis Planning and Monitoring	4. Elicitation and Collaboration	5. Requirements Life Cycle Management	6. Strategy Analysis	7. Requirements Analysis and Design Definition	8. Solution Evaluation
10.45. Survey or Questionnaire	3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance 3.4. Plan Business Analysis Information Management 3.5. Identify Business Analysis Performance Improvements	4.2. Conduct Elicitation		6.1. Analyze Current State 6.2. Define Future State 6.3. Assess Risks	7.5. Define Design Options 7.6. Analyze Potential Value and Recommend Solution	8.1. Measure Solution Performance 8.2. Analyze Performance Measures 8.3. Assess Solution Limitations 8.4. Assess Enterprise Limitations 8.5. Recommend Actions to Increase Solution Value
10.46. SWOT Analysis				6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.6. Analyze Potential Value and Recommend Solution	8.4. Assess Enterprise Limitations
10.47. Use Cases and Scenarios			5.2. Maintain Requirements		7.1. Specify and Model Requirements	8.1. Measure Solution Performance
10.48. User Stories			5.2. Maintain Requirements		7.1. Specify and Model Requirements	

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10.49. Vendor Assessment				6.1. Analyze Current State 6.2. Define Future State 6.4. Define Change Strategy	7.5. Define Design Options	8.1. Measure Solution Performance
10.50. Workshops	3.1. Plan Business Analysis Approach 3.2. Plan Stakeholder Engagement 3.3. Plan Business Analysis Governance 3.4. Plan Business Analysis Information Management 3.5. Identify Business Analysis Performance Improvements	4.2. Conduct Elicitation 4.3. Confirm Elicitation Results 4.4. Communicate Business Analysis Information	5.3. Prioritize Requirements 5.4. Assess Requirements Changes 5.5. Approve Requirements	6.1. Analyze Current State 6.2. Define Future State 6.3. Assess Risks 6.4. Define Change Strategy	7.4. Define Requirements Architecture 7.5. Define Design Options 7.6. Analyze Potential Value and Recommend Solution	8.4. Assess Enterprise Limitations

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Appendix D: Summary of Changes from BABOK® Guide v 2.0

Overview

Version 3 of the *BABOK® Guide* has extensively revised, restructured, and rewritten *BABOK® Guide* version 2.0. This summary of changes provides an overview of where topics covered in version 2.0 may be found in version 3. This summary is not a complete description of the changes, and in some cases the scope of a task or technique has changed significantly at a lower level.

Introduction

Business Analysis

The definition of this primary concept has been updated to align with other changes in the *BABOK® Guide*, specifically the *Business Analysis Core Concept Model*™ (*BACCM*™).

Business Analysis Key Concepts

Business Analysis Core Concept Model™ (BACCM™) (NEW)

A model comprised of six terms that have a common meaning to all business analysis practitioners and helps them discuss business analysis and its relationships in common terminology.

Requirements and Design (NEW)

This section describes the distinction between and overlap of two key business analysis concepts: requirements and design.

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Knowledge Areas

Business Analysis Planning and Monitoring

The focus and name of this knowledge area remains the same for version 3.

Some tasks were renamed, one new task was added and some elements were moved around. Version 3 continues to address the business analyst's role in defining the business analysis work and defining the approach for the initiative.

2.0 Task: Business Analysis Planning and Monitoring	3.0 Task: Business Analysis Planning and Monitoring
2.1 Plan Business Analysis Approach Prioritization and Change Management content shifted to 3.3 Plan Business Analysis Governance	3.1 Plan Business Analysis Approach
2.2 Conduct Stakeholder Analysis	3.2 Plan Stakeholder Engagement
2.3 Plan Business Analysis Activities	3.1 Plan Business Analysis Approach
2.4 Plan Business Analysis Communication	3.2 Plan Stakeholder Engagement
2.5 Plan Requirements Management Process Prioritization and Change Management content shifted to 3.3 Plan Business Analysis Governance	3.4 Plan Business Analysis Information Management
2.6 Manage Business Analysis Performance	3.5 Identify Business Analysis Performance Improvements

Elicitation (Version 2.0 name) is now **Elicitation and Collaboration (Version 3 name)**

The focus of this knowledge area remains similar but has expanded to include communication topics from version 2.0 and the new topic of collaboration.

In addition, the simpler content from version 2.0 was expanded to provide more guidance for practitioners. Also, an explicit reference to unplanned elicitation is made to acknowledge the informal elicitation that can occur during conversation. Business analysis information is also referenced throughout rather than just requirements as the object of elicitation.

2.0 Task: Elicitation	3.0 Task: Elicitation and Collaboration
3.1 Prepare for Elicitation	4.1 Prepare for Elicitation
3.2 Conduct Elicitation Activity	4.2 Conduct Elicitation

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3.4 Confirm Elicitation Results	4.3 Confirm Elicitation Results
3.3 Document Elicitation Results	4.4 Communicate Business Analysis Information
n/a	4.5 Manage Stakeholder Collaboration

Requirements Management and Communication (Version 2.0 name) is now Requirements Life Cycle Management (Version 3 name)

Requirements Life Cycle Management was determined to be a more appropriate name for this knowledge area in order to emphasize that requirements have their own life cycle and that requirements management is an ongoing activity.

Communication activities were shifted from this knowledge area to the Elicitation and Collaboration knowledge area.

2.0 Task: Requirements Management and Communication	3.0 Task: Requirements Life Cycle Management
4.1 Manage Solution Scope and Requirements Solution Scope Management is addressed within 5.1 Trace Requirements. Conflict and Issue Management and Presenting Requirements for Review are addressed in 5.5 Approve Requirements.	5.1 Trace Requirements 5.5 Approve Requirements
4.2 Manage Requirements Traceability Relationships and Configuration Management are addressed in 5.1 Trace Requirements. Impact Analysis is addressed in 5.4 Assess Requirements Changes.	5.1 Trace Requirements 5.4 Assess Requirements Changes
4.3 Maintain Requirements for Reuse	5.2 Maintain Requirements
4.4 Prepare Requirements Package	4.4 Communicate Business Analysis Information
4.5 Communicate Requirements	4.4 Communicate Business Analysis Information

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	5.3 Prioritize Requirements Moved from 6.1 Prioritize Requirements (v2.0)
N/A	5.5 Approve Requirements New task which includes the concepts from the v2 Elements Conflict and Issue Management , Presenting Requirements for Review and Approval from the v2 Task Manage Solution Scope and Requirements.

Enterprise Analysis (Version 2.0 name) is now **Strategy Analysis (Version 3 name)**

This knowledge area has taken on a new name and expanded purpose.

Enterprise Analysis focused on the upfront work the business analyst conducted at the start of a project. Strategy Analysis is broader and includes the work the business analyst conducts to understand the current state of the business, to define the desired future state, to develop a change strategy to achieve the desired business outcomes and to assess the risks inherent in the change strategy.

2.0 Task: Enterprise Analysis	3.0 Task: Strategy Analysis
5.1 Define Business Need Business Problem or Opportunity is addressed in 6.1 Analyze Current State. Business Goals and Objectives and Desired Outcome are addressed in 6.2 Define Future State.	6.1 Analyze Current State, 6.2 Define Future State
5.2 Assess Capability Gaps Current Capability Analysis is addressed in 6.1 Analyze Current State. Assessment of New Capability Requirements and Assumptions are addressed in 6.2 Define Future State.	6.1 Analyze Current State, 6.2 Define Future State, 6.4 Define Change Strategy Define Change Strategy includes a Gap Analysis which was not explicitly identified in 5.2 Assess Capability Gaps but was the intent of the task.
5.3 Determine Solution Approach Alternative Generation and Assumptions and Constraints are addressed in 6.2 Define Future State. Ranking and Selection of Approaches is addressed in 7.5 Define Design Options and 7.6 Analyze Potential Value and Recommend Solution.	6.2 Define Future State, 7.5 Define Design Options (v3 Requirements Analysis and Design Definition knowledge area), 7.6 Analyze Potential Value and Recommend Solution (v3 Requirements Analysis and Design Definition knowledge area)

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5.4 Define Solution Scope	6.4 Define Change Strategy
5.5 Define Business Case	7.6 Analyze Potential Value and Recommend Solution (Requirements Analysis and Design Definition knowledge area), 10.7 Business Cases (Technique)

Requirements Analysis (Version 2.0 name) is now **Requirements Analysis and Design Definition (Version 3 name)**

This knowledge area was renamed to accommodate expanded content.

Version 3 now addresses the topic of design and explains where business analysts have involvement with design activities. Requirements Analysis and Design Definition also incorporates some of the tasks from the version 2.0 Solution Assessment and Validation. Activities involved with the proposed solution assessment—before any construction of a solution; whether in part or in whole—are now part of this Requirements Analysis and Design Definition.

2.0 Task: Requirements Analysis	3.0 Task: Requirements Analysis and Design Definition
6.1 Prioritize Requirements	5.3 Prioritize Requirements (v3 Requirements Life Cycle Management knowledge area)
6.2 Organize Requirements	7.4 Define Requirements Architecture
6.3 Specify and Model Requirements	7.1 Specify and Model Requirements
6.4 Define Assumptions and Constraints Assumptions and Business Constraints are addressed in 6.2 Define Future State. Technical Constraints are addressed in 7.6 Analyze Potential Value and Recommend Solution	6.2 Define Future State (v3 Strategy Analysis knowledge area) and 7.6 Analyze Potential Value and Recommend Solution
6.5 Verify Requirements	7.2 Verify Requirements
6.6 Validate Requirements	7.3 Validate Requirements

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N/A	7.5 Define Design Options New task in Requirements Analysis and Design Definition which incorporates 5.3 Determine Solution Approach (v2.0 Enterprise Analysis knowledge area), 7.1 Assess Proposed Solution (v2.0 Solution Assessment and Validation knowledge area), and 7.2 Allocate Requirements (v2.0 Solution Assessment and Validation knowledge area)
N/A	7.6 Analyze Potential Value and Recommend Solution New task in Requirements Analysis and Design Definition which incorporates 5.5 Define Business Case (v2.0 Enterprise Analysis knowledge area) and 7.1 Assess Proposed Solution (v2.0 Solution Assessment and Validation knowledge area)

Solution Assessment and Validation (Version 2.0 name) is now **Solution Evaluation (Version 3 name)**

The version 3 knowledge area provides less focus on implementing a solution and more focus on evaluating solutions.

The knowledge area includes content on evaluating whether value is being delivered by a solution and discusses the business analyst's role in assessing what is hindering an organization from receiving full value from a solution.

2.0 Task: Solution Assessment and Validation	3.0 Task: Solution Evaluation
7.1 Assess Proposed Solution	7.5 Define Design Options and 7.6 Analyze Potential Value and Recommend Solution (v3 Requirements Analysis and Design Definition knowledge area)
7.2 Allocate Requirements	7.5 Define Design Options (v3 Requirements Analysis and Design Definition knowledge area)
7.3 Assess Organizational Readiness	6.4 Define Change Strategy (v3 Strategy Analysis knowledge area)

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7.4 Define Transition Requirements	6.4 Define Change Strategy (v3 Strategy Analysis knowledge area), 2.3 Requirements Classification Schema
7.5 Validate Solution	8.3 Assess Solution Limitations
7.6 Evaluate Solution Performance	8.5 Recommend Actions to Increase Solution Value
N/A	8.1 Measure Solution Performance New task that incorporates defining solution performance measures and measuring the actual performance
N/A	8.2 Analyze Performance Measures New task that focuses on comparing the actual value (solution performance) against the expected value
N/A	8.4 Assess Enterprise Limitations New task that identifies what, external to the solution, may be preventing it from delivering its expected value

Underlying Competencies

Analytical Thinking and Problem Solving

- NEW—Conceptual Thinking
- NEW—Visual Thinking

Behavioural Characteristics

- Ethics—removed
- Personal Organization—renamed and expanded Organization and Time Management
- NEW—Personal Accountability
- NEW—Adaptability

Business Knowledge

- Business Principles and Practices—renamed Business Acumen
- NEW—Methodology Knowledge

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Communication Skills

- Oral Communications—renamed Verbal Communication
- Teaching—moved to Interaction Skills
- NEW—Non-verbal Communication
- NEW—Listening

Interaction Skills

- Facilitation and Negotiation—split competencies and renamed Facilitation
- NEW—Negotiation and Conflict Resolution

Software Applications (Version 2.0 name) is now **Tools and Technology (Version 3 name)**

- General-Purpose Applications—renamed Office Productivity Tools and Technology
- Specialized Applications—renamed Business Analysis Tools and Technology
- NEW—Communication Tools and Technology

Techniques

Name or Focus Change

- Benchmarking and Market Analysis (v2.0 Benchmarking)
- Data Dictionary (v2.0 Data Dictionary and Glossary)
- Glossary (v2.0 Data Dictionary and Glossary)
- Reviews (v2.0 Structured Walkthrough)
- Risk Analysis and Management (v2.0 Risk Analysis)
- Use Cases and Scenarios (v2.0 Scenarios and Use Cases)
- User Stories
- Workshops (v2.0 Requirements Workshop)

New Techniques

- Backlog Management
- Balanced Scorecard
- Business Capability Analysis

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- Business Case
- Business Model Canvas
- Collaborative Games
- Concept Modelling
- Data Mining
- Decision Modelling
- Financial Analysis
- Mind Mapping
- Prioritization
- Process Analysis
- Roles and Permissions Matrix
- Stakeholder List, Map, or Personas

Perspectives (NEW)

Perspectives are used within business analysis work to provide focus to tasks and techniques specific to the context of the initiative.

Most initiatives are likely to engage one or more perspectives. The perspectives included in the *BABOK® Guide* are:

- Agile,
- Business Intelligence,
- Information Technology,
- Business Architecture, and
- Business Process Management.

These perspectives do not presume to represent all the possible perspectives from which business analysis is practiced. The perspectives discussed in the *BABOK® Guide* represent some of the more common views of business analysis at the time of writing.

Perspectives are not mutually exclusive, in that a given initiative might employ more than one perspective.

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International Institute of Business Analysis™ (IIBA®) is the independent non-profit professional association formed in 2003 to serve the growing field of business analysis.

As the voice of the business analysis community, IIBA supports the recognition of the profession, and works to maintain standards for the practice and certification. Through a global network, IIBA connects Members, Chapters, Corporations and Partners around the world to advance the business analysis profession by *uniting a community of professionals to create better business outcomes*.

For individuals working in a broad range of roles – business analysis, systems analysis, requirements analysis, project management, consulting, process improvement and more – IIBA provides the resources to help you enhance your career and advance your career path.

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STRATEGY
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SOLUTIONS

A Guide to the Business Analysis Body of Knowledge® (BABOK® Guide) is the only globally recognized standard of practice for business analysis. Developed through a rigorous consensus-driven standards process, the *BABOK® Guide* incorporates the collective wisdom and experience of experts in the field from around the world.

Previous editions have guided hundreds of thousands of professionals in their work, and it has been adopted by hundreds of enterprises as the basis of their business analysis practice.

This latest version of the guide extends its scope beyond business analysis in projects to address agile development, business process management, business intelligence, and business architecture.

This thoroughly revised and updated version includes:

- A concept model that unifies ideas and terminology across business analysis disciplines.
- Restructured knowledge areas to support business analysis at every level from small tactical initiatives to major business transformations.
- Five perspectives covering the most prominent business analysis disciplines and demonstrating how to apply the knowledge areas in different situations.
- Coverage of new business analysis techniques that have gained wide acceptance in the community.
- Updated and revised content in every knowledge area and more!

Whether you are considering starting a career in business analysis, or you are an experienced professional in the field, the *BABOK® Guide* is your key resource to help you and your stakeholders discover opportunities for business success, deliver successful organizational change, and create business value.

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