Business Analysis Notes

Business Requirements Specification (BRS)

Business requirement specification (BRS) in general is the collection of requirements from multiple stakeholders to satisfy what is to come with the software being developed. These requirements must be in accordance with the project's policies and include documentation ranging from business purpose to life-cycle concepts to satisfy the customer's needs and expectations.

Reading Notes

SWEBOKwiki Business or Mission Analysis

Source - https://www.sebokwiki.org/wiki/Business_or_Mission_Analysis

The starting point of engineering any system-of-interest (SoI) is understanding the socio-economic and technological context in which potential problems reside. Understand enterprise strategic goals and stakeholder needs, expectations, and requirements while taking into account the views of users, acquirers, and customers.

Mission Analysis (MA) - The set of systems engineering activities in which the problem space and the needs of the business or enterprise and stakeholders are closely examined. Which is normally performed iteratively with the stakeholder's needs and requirements to better understand the problem.

The purpose of MA is to understand a mission problem, analyze the solution space, and initiate the life cycle of a potential solution.

MA, in some domains called market analysis or business analysis, is the identification, characterization, and assessment of an operational problem within the enterprise. MA is needed to define needed (or desired) operational actions, not hardware/software functions; it's focused on defining the problem, not the solution.

MA begins with the business vision and Concept of Operations (ConOps) (IEEE. 1998), and other organization strategic goals and objectives including the mission (or business function). The primary product of MA is Business or Mission needs, which are supported by preliminary life-cycle concepts - including a preliminary acquisition concept, a preliminary operational concept (OpsCon), a preliminary deployment concept, a preliminary support concept, and a preliminary retirement concept.

MA include mathematical analysis, modeling, simulation, visualization, and other analytical tools to characterize the intended mission and how to best achieve the needs/objectives. Thus, MA defines the problem space and analyzes the solution space alternatives using quality attribute constraints driven by the enterprise objectives.

The ConOps is at an organizational level, prepared by enterprise management and refined by business management. The ConOps, at the organizational level, addresses the leadership's intended way of operating the organization.

The ConOps informs the OpsCon, which is drafted by business management in the Mission Analyst activity and refined by stakeholders in the Stakeholder Needs and Requirements activity. A system OpsCon document describes what the system will do (not how it will do it) and why (rationale).

Major activities and task during the MA process:

1. Review and understand the enterprise mission, vision, and ConOps.
2. Identify and define any gaps and opportunities related to the future evolution of the strategy.
3. Examine and evaluate the solution space.
4. Perform appropriate modeling, simulation, and analytical techniques to understand the feasibility and value of the alternative candidate solutions. Model or simulate operational scenarios from these services and use cases, and enrich them through reviews from stakeholders and subject matter experts.
5. Define basic operational concept or market strategy, and/or business models.
6. Evaluate the set of alternatives and select the best alternative.
7. Provide feedback on feasibility, market factors, and alternatives for use in the completion of the enterprise strategy and further actions.
8. Define preliminary deployment concept, preliminary support concept, and preliminary retirement concept.

MA process may create several artifacts:

- recommendations for revisions to the enterprise ConOps
- preliminary operational concept document or inputs;
- Mission analysis and definition reports (perhaps with recommendations for revisions of the mission);
- a set of business needs;
- preliminary life-cycle concepts (preliminary operational concept, preliminary deployment concept, preliminary support concept, and preliminary retirement concept;

- system analysis artifacts (e.g., use case diagrams, context diagrams, sequence/activity diagrams, functional flow block diagrams);
- trade study results (alternatives analysis);
- market study/analysis reports; and
- a set of business (or mission) requirements (often captured in a business requirement specification).

MA techniques:

- use case analysis;
- operational analysis;
- functional-analysis;
- technical documentation review;
- trade studies;
- modeling;
- simulation;
- prototyping;
- workshops, interviews, and questionnaires;
- market competitive assessments;
- benchmarking; and
- organizational analysis techniques (e.g., strengths, weaknesses, opportunities, threats (SWOT analysis), and product portfolios).

29148-2018 6.2 Business or mission analysis process

Source - https://www.iso.org/obp/ui/#iso:std:iso-iec-ieee:29148:ed-2:v1:en or https://sites.google.com/site/profvanselow/course/cen-3073/resources (under standards)

The purpose of the Business or Mission Analysis process is to define the business or mission problem or opportunity, characterize the solution space and determine potential solution class(es) that could address a problem or take advantage of an opportunity.

Results of a successful implementation of the Business or Mission Analysis process:

- The problem or opportunity space is defined.
- The solution space is characterized.
- Preliminary operational concepts and other concepts in the life cycle stages are defined.
- Candidate alternative solution classes are identified and analyzed.
- The preferred candidate alternative solution class(es) are selected.
- Any enabling systems or services needed for business or mission analysis are available.
- Traceability of business or mission problems and opportunities and the preferred alternative solution classes is established.

The organization strategy generally has the direction and the business or mission objectives for the organization, including any problems that should be addressed. By reviewing the problems, organizations can identify deficiencies or gaps in existing capabilities, systems, products, or services.

When preparing for Business or Mission Analysis:

- Review identified problems and opportunities in the organization strategy with respect to desired organization goals or objectives.
- Define the business or mission analysis strategy (approaches, milestones, and specific considerations to ensure the business or mission needs are elaborated).
- Identify and plan for the necessary enabling systems or services needed to support business or mission analysis (such as repositories of the organization, business development and marketing analysis resources, and services that provide insight into the problem space and solution space).
- Obtain or acquire access to the enabling systems or services to be used.

Defining the problem or opportunity space:

- Analyze the problems and opportunities in the context of relevant trade-space factors (factors define the problem in terms of what is important to the mission or business opportunity, be sure to identify and understand the scope of the problem).
- Define the mission, business, or operational problem or opportunity (every analysis task should begin with a concise statement of the problem, sometimes called a mission statement or strategic business objective).

Characterizing the solution space:

- Define preliminary operational concepts and other concepts in life cycle stages.

- Typical life-cycle concepts include:
  - The OpsCon outlines operational aspects of the system solution (new or evolved) in the context of the intended operation of the organization. It provides the lower-level operations-oriented concepts that address a part of the organization's ConOps.
  - The Acquisition Concept describes the way the system solution will be acquired including aspects such as stakeholder engagement, source of the solution, requirements definition, solicitation and contracting issues, design, production, and verification.
  - The Deployment Concept describes the way the system solution will be validated, delivered and introduced into operations.
  - The Support Concept describes the desired support infrastructure and manpower considerations for supporting the system solution after it is deployed. A support concept addresses operating support, engineering support, maintenance support, supply support, and training support.
  - The Retirement Concept describes the way the system will be removed from operation and retired, including the disposal of any hazardous materials used in or resulting from the process.
  - Note: Other life cycle concepts could be created to address a specific focus of the life cycle.
- Identify candidate alternative solution classes that span the potential solution space (alternative solutions can represent a group of solutions that may represent a completely different type of design or project, which is why feasibility analysis is an essential step to narrowing the solution to a project which can be managed effectively).

Evaluating alternative solution classes:

- Assess each alternative solution class (It's great to assess alternative solutions but using trade space factors you can define what is most important and have criteria of technical parameters to measure effectiveness or business opportunity, such as market share).
- Select the preferred alternative solution class(es).

Managing the Business or Mission Analysis:

- Maintain traceability of business or mission analysis.
  - Requirements traceability should be established and maintained to document how the business needs and requirements are intended to meet the business problems and opportunities and how they are related to preferred alternative solution classes and stakeholder needs and requirements. Business and mission needs and requirements need to be captured, traced, and maintained throughout the system life cycle and beyond. The use of a requirements management tool can facilitate this process.
- Provide key [artifacts and] information items that have been selected for baselines.
  - Key information items and artifacts would include the preliminary life-cycle concepts, including the OpsCon, the acquisition concept, the deployment concept, the support concept, and the retirement concept. Additionally, the trade study reports and supporting analysis may also be key information items.

29148-2018 8.2.2 BRS example outline

Source - https://www.iso.org/obp/ui/#iso:std:iso-iec-ieee:29148:ed-2:v1:en or https://sites.google.com/site/profvanselow/course/cen-3073/resources (under standards)

The specific requirements clause of the BRS should be organized such that the consensus of stakeholders agrees that the organization method aids understanding of the requirements. There is no optimal organization for all projects but here's an example outline of a BRS created in an organizational/ business context.

1. **Introduction**
  1.1 Business purpose
  1.2 Business scope
  1.3 Business overview
  1.4 Definitions
  1.5 Major stakeholders
2. **References**
3. **Business management requirements**
  3.1 Business environment
  3.2 Mission, goals, and objectives
  3.3 Business model
  3.4 Information environment
4. **Business operational requirements**
  4.1 Business processes
  4.2 Business operational policies and rules
  4.3 Business operational constraints
  4.4 Business operational modes
  4.5 Business operational quality
  4.6 Business structure
5. **Preliminary operational concept of proposed system**
  5.1 Preliminary operational concept
  5.2 Preliminary operational scenarios
6. **Other preliminary life-cycle concepts**
  6.1 Preliminary acquisition concept
  6.2 Preliminary deployment concept
  6.3 Preliminary support concept
  6.4 Preliminary retirement concept
7 **Project Constraints**
8. **Appendix**
  8.1 Acronyms and abbreviations

29148-2018 9.3 Business requirement specification (BRS) content

Source - https://www.iso.org/obp/ui/#iso:std:iso-iec-ieee:29148:ed-2:v1:en or https://sites.google.com/site/profvanselow/course/cen-3073/resources (under standards)

Projects shall produce information for item concepts in accordance with the project's policies with respect to the business requirements specification. Organization of the content such as the order and section structure may be selected in accordance with the project's information management policies.

The **business purpose** is to describe at the organizational level the reason and background for which the organization is pursuing new business or changing the current business in order to fit a new management environment. In this context, it should describe how the proposed system will contribute to meeting business objectives.

Business scope should define the business domain under consideration by:

- identifying the business domain by name;

- defining the range of business activities included in the business domain concerned. The scope can be defined in terms of divisions in the organization and external entities that relate directly to the business activities, or functions to be performed by the business activities. It is helpful to show environmental entities that are outside of the scope;
- describing the scope of the system being developed or changed. The description includes assumptions on which business activities are supported by the system.

Business overview should describe major internal divisions and external entities of the business domain concerned and how they are interrelated. A diagrammatic description is recommended.

List the **major stakeholders** (**Stakeholder** - a person with an interest or concern in the business such as customers, users, business analyst, and developers) or the classes of stakeholders and describe how they will influence the organization and business or can be related to the development and operation of the system.

Business environment should define external and internal environmental factors that should be taken into consideration in understanding the new or existing business and eliciting the stakeholder's requirements for the system to be developed or changed. The environmental factors should include possible influences on the business and consequently the system from external conditions like market trends, laws and regulations, social responsibilities, and technology base.

Mission, goals, and objectives are to describe the business results to be obtained through or by the proposed system.

Business Model should describe methods by which the business mission is expected to be achieved. The description should be concentrated on the methods supported by the system to be developed or changed with the items such as product and services, geographies and locales, distribution channels, business alliance and partnership, and finance and revenue model.

Information environment should describe the overall strategy for the organization on common bases for multiple information systems. Including the following items:

- **project portfolio** – when multiple system projects are running or planned to pursue the same the business goal, the priority, relative positioning, and possible constraints come from the portfolio management strategy
- **long term system plan** – when common system infrastructure or architecture has been decided or planned, it should be described as constraints on possible design decisions.
- **database configuration** – an organization level database configuration plan and possible constraints on availability and accessibility of organization global data should be specified.

Business processes make an ordered structure with decomposition and classification. Each business process should be uniquely named and numbered in the structure. The description of the individual process should be represented as a diagram representing a sequence of activities.

Business operational policies and rules should describe logical propositions in conducting the business processes. These propositions conditions may be to start, branch, and terminate the sequence of the business activities in the business processes. Functional requirements are discussed in the SyRS and SRS. Policies should be uniquely named and numbered and shall be referenced in the description of the business processes.

Business operational constraints are conditions to be imposed in conducting the business process. These constraints could be performance constraints (finish in a certain time frame), and management requisite such as (monitor and record every occurrence of the process).

Business operational modes should describe the methods to conduct a business operation in an unsteady state (such situations could be accidents or natural disasters).

Business operational quality should define the level of quality required for the business operation. (Example: address urgency with higher priority than the reliability of the business process).

Business Structure must be set to identify and describe the structure in the business relevant to the system, such as organizational structure (divisions and departments), role and responsibility structures, geographic structures, and resource sharing structures.

High-level operational concept must describe the proposed system in a high-level manner, indicating the operational features that are to be provided without specifying design details. Including:

- operational policies and constraints;
- description of the proposed system;
- modes of system operation;
- user classes and other involved personnel; and
- support environment.

High-level operational scenarios must give descriptive examples of how users/operators/maintainers will interact with the system in important contexts of use. These scenarios should be uniquely named and numbered and should be referenced in the description of the business processes.

Other high-level life cycle concepts should describe how the system of interest is to be acquired, deployed, supported, and retired.

Project constraints describe constraints to performing the project within cost and schedule.

The Business Analysis Process: 8 Steps to Being an Effective Business Analyst (through step 4)

Source - https://www.bridging-the-gap.com/business-analysis-process/

Step 1 - Get Oriented

A business analyst's job is to clarify the scope, requirements, and business objectives as quickly as possible. But don't get into detailed requirements right away as it can lead in the wrong direction.

Take some time to ensure you are not only moving quickly but also able to be an effective and confident contributor to the project.

Key responsibilities in this step include:

- Clarifying your role as the business analyst so that you are sure to create deliverables that meet stakeholder needs.
- Determining the primary stakeholders to engage in defining the project's business objectives and scope, as well as any subject matter experts, to be consulted early in the project.
- Understanding the project history so that you don't inadvertently repeat work that's already been done or rehash previously made decisions.
- Understanding the existing systems and business processes so you have a reasonably clear picture of the current state that needs to change.

Step 2 - Discover the Primary Business Objectives

Jumping right into defining the scope of the project can lead to unnecessary headaches. Uncovering and getting agreement on the business needs early in a project and before the scope is defined is the quickest path forward to a successful project.

Key responsibilities include:

- Discovering expectations from your primary stakeholders - essentially discovering the "why" behind the project.
- Reconciling conflicting expectations so that the business community begins the project with a shared understanding of the business objectives and are not unique to one person's perspective.
- Ensuring the business objectives are clear and actionable to provide the project team with momentum and context while defining the scope and, later, the detailed requirements.

Step 3 - Define Scope

Scope makes the business needs tangible in such a way that multiple project team participants can envision their contribution to the project and implementation.

Key responsibilities include:

- Defining a solution approach to determine the nature and extent of technology and business process changes to be made as part of implementing the solution to the primary business objectives.
- Drafting a scope statement and reviewing it with your key business and technology stakeholders until they are prepared to sign-off or buy-in to the document.
- Confirming the business case to ensure that it still makes sense for your organization to invest in the project.

The scope is not an implementation plan, but it's a guide of all subsequent steps of the business analysis process and task by other project participants.

Step 4 - Formulate Your Business Analysis Plan

A business analysis plan will bring clarity to the business analysis process that will be used to successfully define the detailed requirements for this project.

Key responsibilities include:

- Choosing the most appropriate types of business analysis deliverables, given the project scope, project methodology, and other key aspects of the project context.
- Defining the specific list of business analysis deliverables that will completely cover the scope of the project and identifying the stakeholders who will be part of the creation and validation of each deliverable.
- Identifying the timelines for completing the business analysis deliverables.

In the absence of defining a credible and realistic plan, a set of expectations may be defined for you, and often those expectations are unrealistic as they do not fully appreciate everything that goes into defining analysis deliverables.

Research / Information Literacy

Research is a skill that that is broken down into:

- Description
    - Identifying and collecting credible, reliable information from many sources.
- Aspects
    - Collect
        - Think about information and resources to find solutions before researching.
        - Collect information from different sources.
        - Keep the hypothesis in mind while collecting.
        - Keep track of where all information came from (References page)
    - Identify
        - Know where to find different kinds of information.
        - Use the internet to find information and evidence for research
        - Evaluate credibility.
        - Separate fact from fiction.
        - Use the library for research.
- Action Steps
    - Explore library resources with an expert
    - Learn about academic databases and how to use them
    - Get help from the school's writing center to learn how to find and collect information
    - For research assignments, gather information from multiple credible resources that support different views.

Resources for research can be the internet, Google scholar, power searching with Google, Google advanced search, and FGCU library. Think of research as cooking the better the ingredients the better the meal.

"Software Requirements" Weiger's book Ch. 4 The business analyst

The business analyst role -

The business analyst is the individual who has the primary responsibility to elicit, analyze, document, and validate the needs of the project stakeholders.

The BA plays a central role in collecting and disseminating product information, whereas the project manager takes the lead in communicating project information.
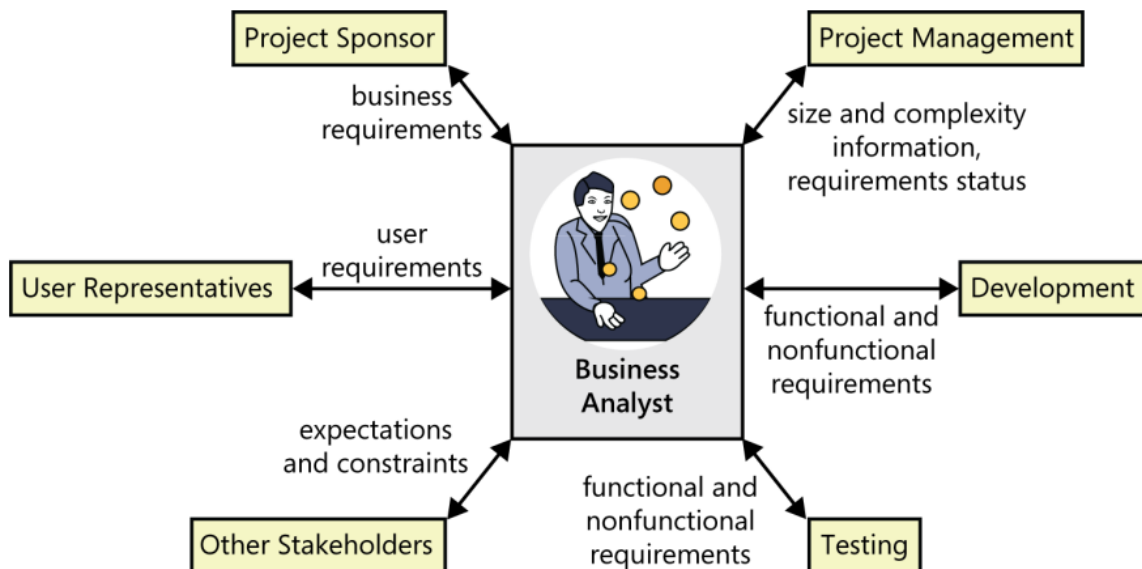

FIGURE 4-1 The business analyst bridges communication between customer and development stakeholders.

A business analyst is a project role, not necessarily a job title. Synonyms for business analyst include requirement analyst, system analyst, requirement engineer, requirement manager, application analyst, business system analyst, IT business analyst, and simple analyst.

These titles are sometimes used inconsistently as some dedicated specialists could perform other project functions. Example: consider a project manager who is also a BA on a project.

A project manager needs to create and manage plans, including schedules and resources needs, based on work that Bas define. The project manager must help manage scope and deal with schedule changes as the scope evolves.

These are distinct roles (although some may wear both hats), requiring somewhat different skill sets.

In organizations that develop consumer products, the analyst role is often the product manager's or marketing staff's responsibility. Essentially, the product manager acts as a BA, often with additional emphasis on understanding the market landscape and anticipating external users' needs. If the project has both a product manager and a BA, typically the product manager focuses on the external market and user demands, and the BA converts those into functional requirements.

Trap: don't assume any talented developer can automatically be an effective business analyst without training.

A talented analyst can make the difference between a project that succeeds and one that struggles. Using highly experienced analysts can reduce the project's overall effort by one-third compared to similar projects with inexperienced analysts.

The business analyst's tasks -

The analyst must first understand the business objectives for the project and then define user, functional, and quality requirements that allow teams to estimate and plan the project and to design, build, and verify the product. The Ba is also a leader and a communicator, turning vague customer notions into clear specifications for the team.

Typical activities for a BA:

- **Define business requirements** - Your work as a BA begins when you help the business or funding sponsor, product manager, or marketing manager define the project's business requirements. You may suggest a template vision/scope document and work with those who hold the vision to help them express it clearly.
- **Plan the requirements approach** - The analyst should develop plans to elicit, analyze, document, validate, and manage requirements throughout the project. Work closely with the project manager to ensure these plans align with the overall project plans and will help achieve the project goals.
- **Identify project stakeholders and user classes** - Work with the business sponsors to select appropriate representatives for each user class, enlist their participation, and negotiate their responsibilities.
- **Elicit requirements** - Articulate system capabilities by using a variety of information-gathering techniques.
- **Analyze requirements** - Derive requirements that are a logical consequence of customer request and for implicit requirements that the customers seem to expect without saying so. Use requirement models to recognize patterns, identify gaps in the requirements, reveal conflicting requirements, and confirm that all requirements specified are within scope.
- **Document requirements** - The analyst is responsible for documenting requirements in a professional manner that describes the solution and addresses the customer's problem. Templates accelerate templates.
- **Communicate requirements** - Requirements should be communicated effectively and efficiently to all parties. The BA needs to know that representing requirements is an ongoing collaboration to ensure that the team understands the information being communicated. Requirements can be represented in the text, visual tables, mathematical equations, and prototypes.
- **Lead requirements validation** - The BA must ensure the requirements possess the desired characteristics and have a solution based on requirements that satisfy stakeholder needs. BA should also review designs and tests that were derived from the requirements to ensure that the requirements were interpreted correctly.
- **Facilitate requirements prioritization** - The analyst brokers collaboration and negotiation among the various stakeholders and the developers to ensure that they make sensible priority decisions in alignment with achieving business objectives.
- **Manage requirements** - Business analyst is involved throughout the entire software development life cycle, by helping create, review, and execute the project's requirements management plan. Establish a requirement baseline for a given product release and shift focus to tracking the status of requirements, verifying their satisfaction in the product, and managing changes to the requirements baseline.

Essential analyst skills -

An effective BA combines strong communication, facilitation, and interpersonal skills with technical and business domain knowledge and the right personality for the job.

Soft-skills for success:

- **Listening skills** - Become proficient at two-way communication, learn how to listen effectively. Learn how collaborators prefer to communicate to avoid personal filters of understanding and watch for unstated assumptions.
- **Interviewing and questioning skills** - BA must be able to interact with diverse individuals and groups about their needs. You need to ask the right questions to surface essential requirement information.
- **Thinking on your feet** - Business analysts need to be aware of the existing information and process new information against it. They need to spot contradictions, uncertainty, vagueness, and assumptions so they can discuss them at the moment if appropriate.

- **Analytical skills** - An effective business analyst must be able to think at both high and low levels of abstraction to drill down high-level information into details and be able to generalize specific needs from one set of requirements that will satisfy multiple stakeholders. They need to critically evaluate information to reconcile conflicts, the separate user "wants" from the underlying user needs, and distinguish solution ideas from requirements.
- **Systems thinking skills** - BA must check requirements against what he knows about the whole enterprise, the business environment, and the application to look for inconsistencies and impacts. If a customer request requirements for his functional area, the BA must judge whether the requirement affects other parts of the system in unobvious ways.
- **Learning skills** - Analysis must learn new material quickly, whether it is about new requirements approaches or the application domain.
- **Facilitation skills** - The ability to facilitate requirements discussion and elicitation workshops are vital analyst capabilities.
- **Leadership skills** - Strong analyst can influence a group of stakeholders to accomplish a common goal. Leadership requires understanding a variety of techniques to negotiate agreements among project stakeholders, resolve conflicts, and make decisions.
- **Observational skills** - An observant analyst could detect subtleties that the user might not think to mention and expose new areas for elicitation discussions, thereby revealing additional requirements.
- **Communication skills** - The analyst needs a solid command of the language and the ability to express complex ideas clearly, both in written form and verbally.
- **Organizational skills** - Bas must contend with a vast array of jumbled information gathered during elicitation and analysis. Set up an information architecture to support the project information as it grows throughout the project.
- **Modeling skills** - Models ranging from the venerable flowchart through structured analysis models (data flow diagram, entity-relationship diagram, and similar diagrams) to Unified Modeling Language (UML) notations should be part of every analyst's repertoire (Beatty and Chen 2012). Some will be useful when communicating with users, others when communicating with developers, and still others purely for analysis to help the BA improve the requirements. The BA will need to know when to select specific models based on how they add value. Also, he'll need to educate other stakeholders on the value of using these models and how to read them.
- **Interpersonal skills** - A BA should be easy to communicate with and be clear and consistent when communicating with team members.
- **Creativity** - The best analysts invent potential requirements for customers to consider. They conceive innovative product capabilities, imagine new markets and business opportunities, and think of ways to surprise and delight their customer.

Essential analyst knowledge -

An effective analyst has a rich tool kit of techniques available and knows when - and when not - to use each one.

An analyst with a sound understanding of project management, development life cycles, risk management, and quality engineering can help prevent requirements issues from torpedoing the project. In commercial settings, the BA will benefit from the knowledge of product management concepts.

Knowledge of the business, the industry, and the organization are powerful assets for an effective BA.

The making of a business analyst -

All analysts should decide which of the knowledge and skills described in this chapter pertain to their situation and actively seek to fill their own gaps.

Filling in the gaps from different backgrounds:

The former user -

A business analyst who migrated into that role after working on the business side as a user of information systems can easily gain the trust of their former colleagues as they speak the user's language and know the existing system and business process.

On the downside, former users who are now BA's may know little about software engineering or how to communicate with technical people. This could lead to focusing on solution ideas that fail to solve the real problem. Meaning a BA should be able to learn about software development to display information to multiple audiences.

The former developer or tester -

Some developers have little patience with users, preferring to work on code and promote tech but others do recognize the importance of the requirement process and can work as an analyst when necessary but may need to learn more about the business domain. Developers easily focus on software to be built instead of customer's needs meaning they will most likely need training for diverse soft skills that best analyst master. Testers aren't commonly asked to become BA's but their analytical mindset can make them a good candidate.

The former (or concurrent) project manager -

Project managers may fill the role of a BA's well since they share some of the same skills such as communication skills, organizations, business domains, and strong organizational and writing skills as well.

However, former project managers need to learn more about requirements engineering practices to develop the analysis, modeling, and interviewing skills that are less important for project managers but are essential to BA success.

The subject matter expert -

The business analyst who is a domain expert might specify the system's requirements to suit his own preferences, rather than addressing the legitimate needs of the various user classes. He might have blinders on when thinking about requirements and be less creative in proposing new ideas. SMEs are experts in their understanding of the "as-is" system; they sometimes have difficulty imagining the "to-be" system. It often works better to have a BA from the development teamwork with the SME, who then serves as a key user representative or product champion.

The rookie -

Rookies demonstrate many skills required to be a good analyst but lack related experience and knowledge. Meaning recent graduates will have a lot of learning to execute BA tasks and practices.

The analyst role on agile projects -

Some agile approaches have a key team member called a product owner (which performs traditional BA activities).
Suggestions for a BA to apply when working on an agile project:

- Define a lightweight, flexible requirements process and adapt it as the project warrants.
- Ensure that requirements documentation is at the right level: not too little and not too much. (Many BAs tend to document everything in specifications to the nth degree. Some purists suggest agile projects should have little or no requirements documentation. Neither extreme is ideal.)
- Help determine the best approach to document the backlog, including whether story cards or more formal tools are most appropriate.
- Apply facilitation and leadership skills to ensure that stakeholders are talking to one another frequently about requirements needs, questions, and concerns.
- Help validate that customer needs are accurately represented in the product backlog, and

facilitate backlog prioritization.

- Work with customers when they change their minds about requirements and priorities, and help record those changes. Work with the rest of the team to determine the impact of changes on iteration contents and release plans.

A product owner role may not have all the business analysis skills or time to perform all the related activities in which a BA can bring those critical capabilities to the team.

Creating a collaborative team -

Business analyst has the major responsibility for forging a collaborative relationship among the user representatives and other project stakeholders.
The analyst should steer the project participants toward a requirements agreement that leads to a win-win-win outcome in the following ways:

- Customers are delighted with the product.
- The developing organization is happy with the business outcomes.
- All team members are proud of the good work they did on a challenging and rewarding project.

"Software Requirements" Weiger's book Ch. 5 Establishing the business requirements

Requirements that don't help the project achieve its business objectives shouldn't be implemented.

Defining business requirements -

"Business requirements" refers to a set of information that, in the aggregate, describes a need that leads to one or more projects to deliver a solution and the desired ultimate business outcomes. Business opportunities, business objectives, success metrics, and a vision statement make up the business requirements.

Business requirements issues must be resolved before the functional and nonfunctional

requirements can be fully specified. A statement of the project's scope and limitations helps greatly with discussions of proposed features and target releases. The business requirements provide a reference for making decisions about proposed requirement changes and enhancements. We recommend displaying the business objectives, vision, and scope highlights in every requirement elicitation session so the team can quickly judge whether a proposed requirement is in or out of scope.

Identifying desired business benefits:

Business requirements set the context for, and enable the measurement of, the benefits the business hopes to achieve from undertaking a project. Projects without a clear understanding should not be initiated since they don't know the value it will add to the business.

Business requirements come from funding sponsors, corporate executives, marketing managers, or product visionaries. Challenges could occur but business analysts can ensure that the right stakeholders are setting the business requirements and facilitate elicitation, prioritization, and conflict resolution.

The business benefit has to present a true value for the project's sponsors and to the product's customers. (Example: increasing revenue and decreasing cost).

Product vision and project scope:

Two core elements of business requirements are the vision and the scope. The product vision succinctly describes the ultimate product that will achieve the business objectives. This could serve as the complete solution or just a portion of it. It provides context for making decisions throughout the product's life, and it aligns all stakeholders in a common direction.

The project scope identifies what portion of the ultimate product vision the current project or development iteration will address. It draws a boundary between what is in the project and what is out.

Important - The product vision ensures that we all know where we are hoping to go eventually. The project scope ensures that we are all talking about the same thing for the immediate project or iteration.
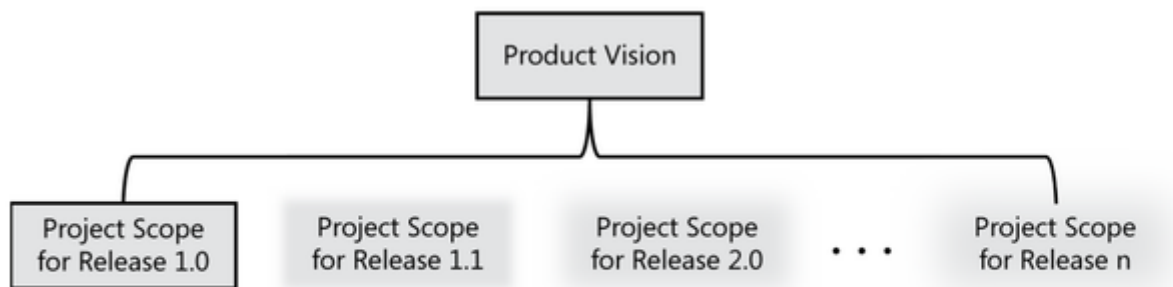

FIGURE 5-1 The product vision encompasses the scope for each planned release, which is less well defined the farther out you look.

Conflicting business requirements:

Business requirements collected from multiple sources might conflict.
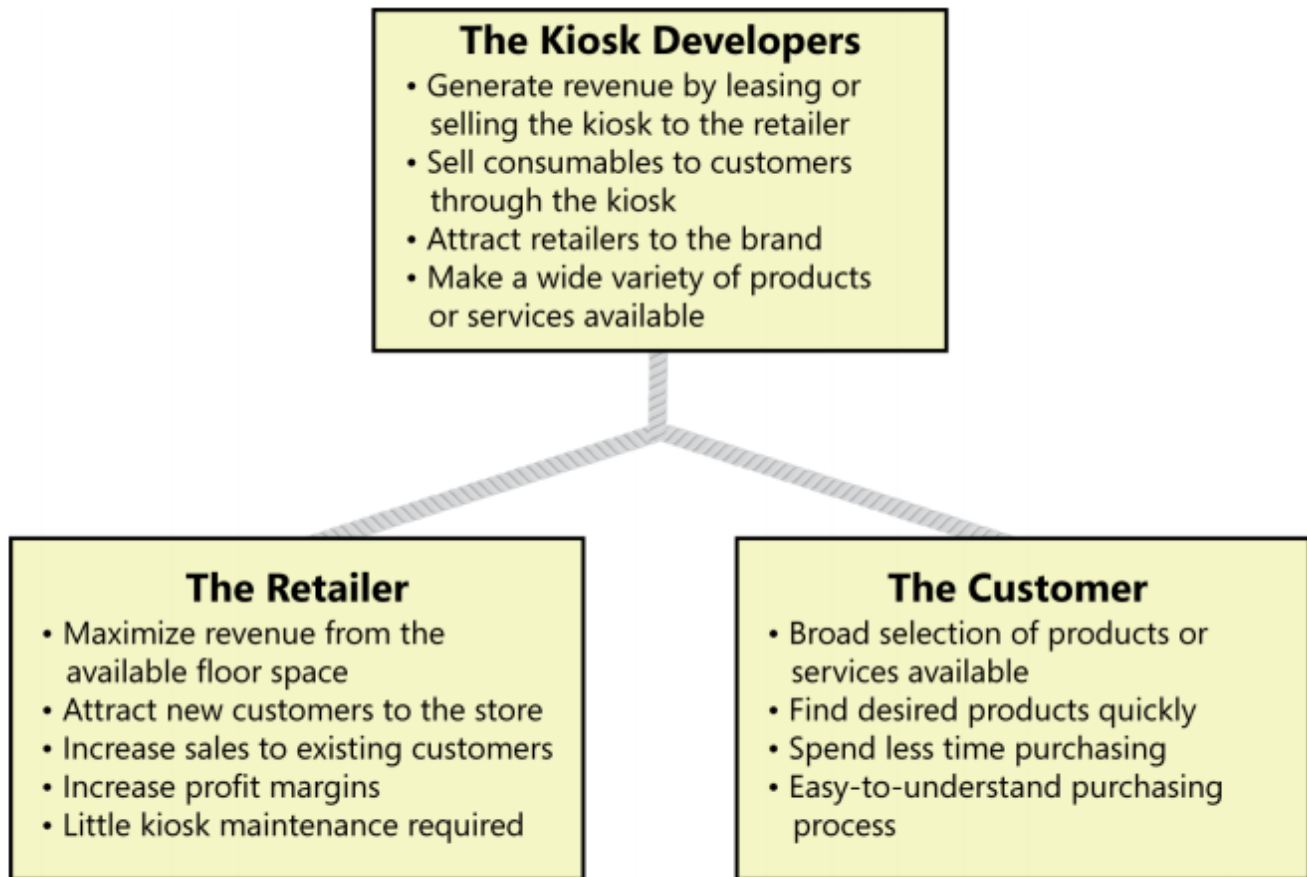Example depicting conflict in a retail store:

The Kiosk Developers
- Generate revenue by leasing or selling the kiosk to the retailer
- Sell consumables to customers through the kiosk
- Attract retailers to the brand
- Make a wide variety of products or services available

The Retailer
- Maximize revenue from the available floor space
- Attract new customers to the store
- Increase sales to existing customers
- Increase profit margins
- Little kiosk maintenance required

The Customer
- Broad selection of products or services available
- Find desired products quickly
- Spend less time purchasing
- Easy-to-understand purchasing process

FIGURE 5-2 Stakeholders for a kiosk don't always have congruent business interests.

Tension among stakeholders with different goals and constraints can lead to clashing business requirements. But the focus should be on delivering the maximum business value to the primary stakeholders.

The project's decision-makers shouldn't expect the software team to resolve conflicts among

various constituencies climb aboard, the scope will grow. Uncontrolled scope creep, in which stakeholders overstuff the new system in an attempt to satisfy every interest, can cause the project to topple under its own weight. A BA can help by surfacing potential areas of conflict and differing assumptions, flagging conflicting business objectives, noting when requested features don't achieve those objectives, and facilitating conflict resolution. Resolving such issues is often a political and power struggle, which lies outside the scope of this book.

If long-term projects experience change immediately revisit the baselined business requirements with the new decision-makers.

Vision and Scope document -

The vision and scope document collects the business requirements into a single deliverable that sets the stage for the subsequent development work.

Organizations that build commercial software often create a market (or marketing) requirements document (MRD). An MRD might go into more detail about the target market segments and the issues that pertain to commercial success.

The owner of the vision and scope document is the project's executive sponsor, funding authority, or someone in a similar role. A business analyst can work with this individual to articulate business requirements and write the vision and scope document.

Template for a vision and scope document. (Note: adapt for your own project if needed)
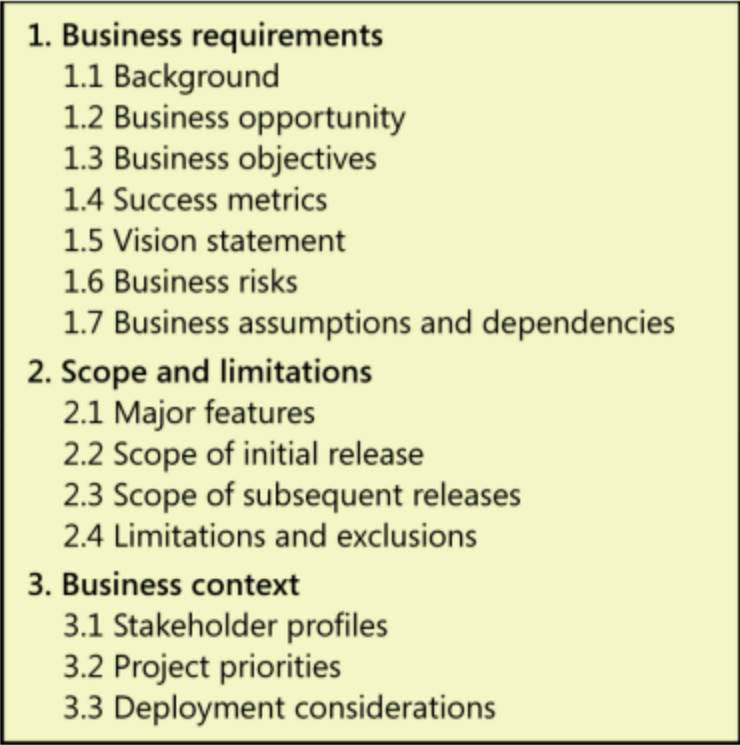
FIGURE 5-3 Suggested template for a vision and scope document.

The vision and scope document only defines the scope at a high level; the scope details are represented by each release baseline that the team defines.

1. **Business requirements:**

Business requirements describe the primary benefits that the new system will provide to its sponsors, buyers, and user. Business requirements directly influence which user requirements to implement and in what sequence.

1.1 Background:

Summarize the rationale and context for the new product or for changes to be made to an existing one. Describe the history or situation that led to the decision to build this product.

1.2 Business opportunity:

Should describe the business problem and evaluate the existing product to indicate why the proposed product is attractive and the advantages it provides. Show trends to provide a complete customer solution. Define any interface and quality requirements, but omit design or implementation specifics.

1.3 Business objectives:

Summarize the important business benefits the product will provide in a quantitative and measurable way.

TABLE 5-1 Examples of financial and nonfinancial business objectives

Financial	Nonfinancial
■ Capture a market share of X% within Y months.	■ Achieve a customer satisfaction measure of at least X within Y months of release.
■ Increase market share in country W from X% to Y% within Z months.	■ Increase transaction-processing productivity by X% and reduce data error rate to no more than Y%.
■ Reach a sales volume of X units or revenue of $Y within Z months.	■ Develop an extensible platform for a family of related products.
■ Achieve X% return on investment within Y months.	■ Develop specific core technology competencies.
■ Achieve positive cash flow on this product within Y months.	■ Be rated as the top product for reliability in published product reviews by a specified date.
■ Save $X per year currently spent on a high-maintenance legacy system.	■ Comply with specific federal and state regulations.
■ Reduce monthly support costs from $X to $Y within Z months.	■ Receive no more than X service calls per unit and Y warranty calls per unit within Z months after shipping.
■ Increase gross margin on existing business from X% to Y% within 1 year.	■ Reduce turnaround time to X hours on Y% of support calls.

The problems describe what is keeping the business from meeting their goals at present, whereas objectives define ways to measure the achievement of those goals. Problem and objectives are intertwined: understanding one can reveal the other.

A conversation between a business analyst and an executive sponsor to identify business problems and objectives might look similar to these figures.

Analyst Questions

What motivates your interest in a chemical tracking system?

How much would you like to reduce your chemical expenses?

What is keeping you from cutting by 25% today? What is causing the high cost and inefficiency?

Anything else I should know?

Executive Responses

Managing chemical inventories manually costs too much and is inefficient.

By 25% within one year.

We buy unnecessary chemicals because we don't know what we have in inventory. We discard too much unused material that has expired.

Placing orders is complicated; it takes users a long time. The government reports we create are manually generated, which takes far too much time.
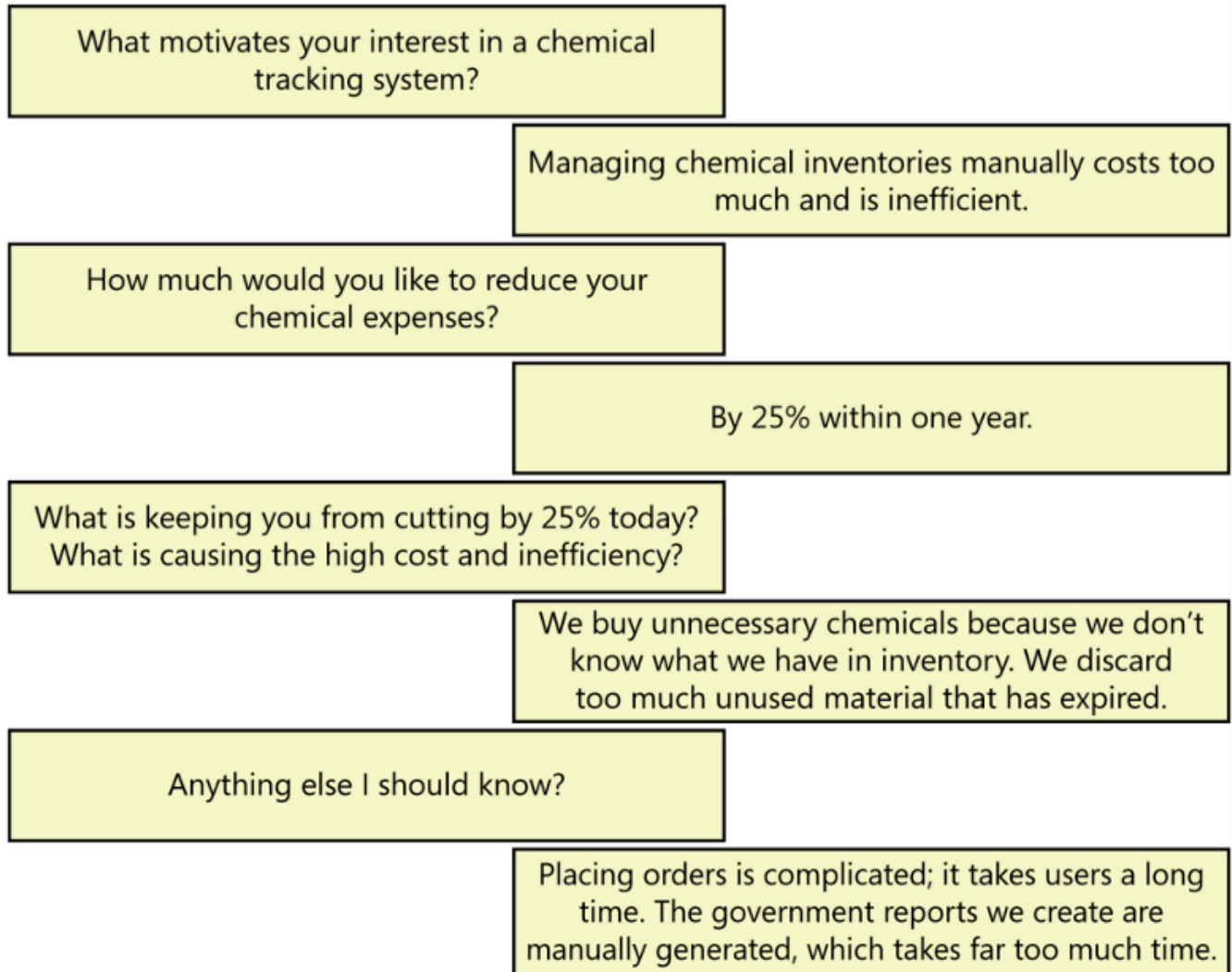
FIGURE 5-4 Example of a conversation between a business analyst and an executive sponsor.

1.4 Success metrics:

Specify the indicators that stakeholders will use to define and measure success on this project. Identify the factors that have the greatest impact on achieving that success, including factors both within and outside the organization's control.

Success metrics indicate whether a project is on track to meet its business objectives. The metrics can be tracked during testing or shortly after product release.
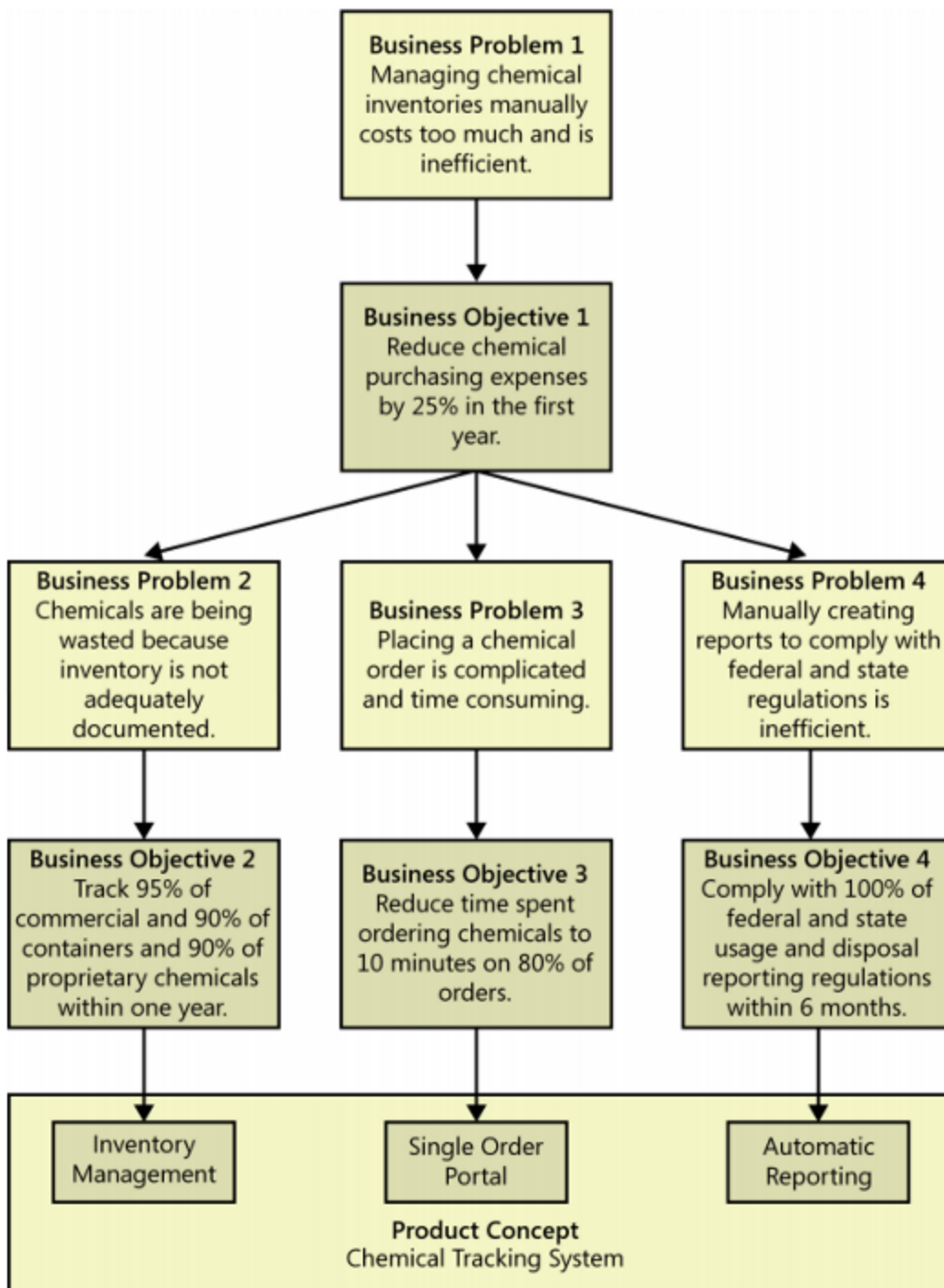
FIGURE 5-5 Example business objectives model for the Chemical Tracking System.

Choose success metrics wisely and make sure they measure what important to your business, not just easy to measure.

1.5 Vision statement:

Write a concise vision statement that summarizes the long-term purpose and intent of the product. The vision statement should reflect a balanced view that will satisfy the expectations of diverse stakeholders.

Template for crafting a product vision statement:

- **For** [target customer]

- **Who** [statement of the need or opportunity]

- **The** [product name]

- **Is** [product category]

- **That** [major capabilities, key benefit, compelling reason to buy or use]

- **Unlike** [primary competitive alternative, current system, current business process]

- **Our product** [statement of primary differentiation and advantages of new product]

You may have several stakeholders and comparing their vision statements is a good way to spot different understandings about the project's objectives.

1.6 Business risks:

Summarize the major business risks associated with developing - or not developing - this product. Business risks are not the same as project risks, which often include resource availability concerns and technology factors.

1.7 Business assumptions and dependencies:

An assumption is a statement that is believed to be true in the absence of proof or definitive knowledge. Business assumptions are specifically related to the business requirements. Which are quantitative assumptions but if you learn that certain assumptions are wrong, you might need to change the scope, adjust the schedule, or launch other projects to achieve the objectives.

Record any assumptions that the stakeholders made when conceiving the project and writing their vision and scope document. If you write them down and review them, you can avoid possible confusion and aggravation in the future.

Broken dependencies are a common source of project delays and these must be communicated with stakeholders to understand why it's critical.

2. Scope and limitations:

Scope and limitations describe what the reaction will and will not do. Meaning both what the solution being developed is and what is not.

Many projects suffer from scope creep - rampant growth as more and more functionality gets stuffed into the product. The first step to controlling scope creep is to define the project's scope. The scope describes the concept and range of the proposed solution.

The scope can be represented in numerous ways. At the highest level, the scope is defined when the customer decides which business objectives to target. At a lower level, the scope is defined at the level of features, user stories, use cases, or events, and responses to include. The scope ultimately is defined through the set of functional requirements planned for implementation in a specific release or iteration.

2.1 Major features:

List of product's major features or user capabilities, emphasizing those that distinguish it from previous or competing products. Think about how users will use the features, to ensure that the list is complete and that it does not include unnecessary features that sound interesting but don't provide customer value. Give each feature a unique and persistent label to permit tracing it to other system elements.

2.2 Scope of initial release:

Summarize the capabilities that are planned for inclusion in inclusion in the initial product release. The scope is often defined in terms of features, but you could define the scope in terms of user stories, use cases, use case flows, or external events. Focus on features that will provide the most value, at the most acceptable cost, to the broadest community, in the earliest time frame.

Initial release accomplished the basic objectives of the system. Future releases will include additional features, options, and usability aids. DO NOT neglect nonfunctional features requirements in the initial release.

2.3 Scope of subsequent releases:

Subsequent releases let you implement additional use cases and features, as well as enriching the capabilities of the initial ones. The farther out you look, the fuzzier these future scope statements will be and the more they will change over time. Expect to shift functionality from one planned release to another and to add unanticipated capabilities.

2.4 Limitations and exclusions:

List any product capabilities or characteristics that a stakeholder might expect but that are not planned for inclusion in the product or in a specific release. List items that were cut from the scope, so the scope decision is not forgotten. List items that were cut from the scope, so the scope decision is not forgotten.

3. Business Context:

This section presents profiles of major stakeholder categories, management's priorities for the project, and a summary of some factors to consider when planning deployment of the solution.

3.1 Stakeholder profiles:

Stakeholders are the people, groups, or organizations that are actively involved in a project, are affected its outcome or are able to influence its outcome. Don't describe every stakeholder group. Focus on different types of customers, target market segments, and the various user classes within those segments.

Each stakeholder profile should include:

- The major value or benefit that the stakeholder will receive from the product. Stakeholder value could be defined in terms of:
  - Improved productivity
  - Reduced rework and waste.
  - Cost savings.
  - Streamlined business processes.
  - Automation of previously manual tasks.
  - Ability to perform entirely new tasks.
  - Compliance with pertinent standards or regulations.
  - Improved usability compared to current products.
- Their likely attitudes toward the product
- Major features and characteristics of interest.
- Any know constraints that must be accommodated.

You might include a list of key stakeholders by name for each profile or an organization chart that shows the relationships among the stakeholders within the organization.

3.2 Project priorities:

To enable effective decision making, the stakeholders must agree on the project's priorities. One way to approach this is to consider the five dimensions of features, quality, schedule, cost, and staff.

Each dimension fits in one of the following three categories on any given project:

- **Constraint** - A limiting factor within which the project manager must operate
- **Driver** - A significant success objective with limited flexibility for adjustment.
- **Degree of freedom** - A factor that the project manager has some latitude to adjust and balance against the other dimensions.

The project manager's challenge is to adjust the degrees of freedom to achieve the project's success drivers within the limits imposed by the constraints. Suppose marketing suddenly demands that you release the product one month earlier than scheduled. How do you respond? Do you:

- Defer certain requirements to a later release?
- Shorten the planned system test cycle?
- Demand over time from your staff or hire contractors to accelerate development?
- Shift resources from other projects to help out?

When change happens, you need to have conversations with the key stakeholders to determine the most appropriate actions to take based on the change requested.

Important - Not all of the five dimensions can be constraints, and they cannot all be drivers. The project manager needs some degrees of freedom to be able to respond appropriately when requirements or project realities change.

3.3 Deployment considerations:

Summarize the information and activities that are needed to ensure the effective deployment of the solution into its operating environment. Describe the access that users will require to use the system, such as whether the users are distributed over multiple time zones or located close to each other. State when the users in various locations need to access the system. If infrastructure changes are needed to support the software's need for capacity, network access, data storage, or data migration, describe those changes. Record any information that will be needed by people who will be preparing training or modifying business processes in conjunction with the deployment of the new solution.

Scope representation techniques -

Models can be included in the vision and scope document or stored elsewhere and referenced as needed.

The purpose of tools such as the context diagram, ecosystem map, feature tree, and event list is to foster clear and accurate communication among the project stakeholders.

Context diagrams, ecosystem maps, feature trees, and event lists are the most common way to represent scope visually but other techniques could be used.

Context diagram -

The scope description establishes the boundary and connections between the system you're developing and everything else in the universe. The context diagram visually illustrates this boundary. It identifies external entities (also called **terminators**) outside the system that interface to it in some way, as well as data, control, and material flow between the terminators and the system. The context diagram is the top level in a data flow diagram developed according to the principles of structured analysis, but it's a useful model for all projects.
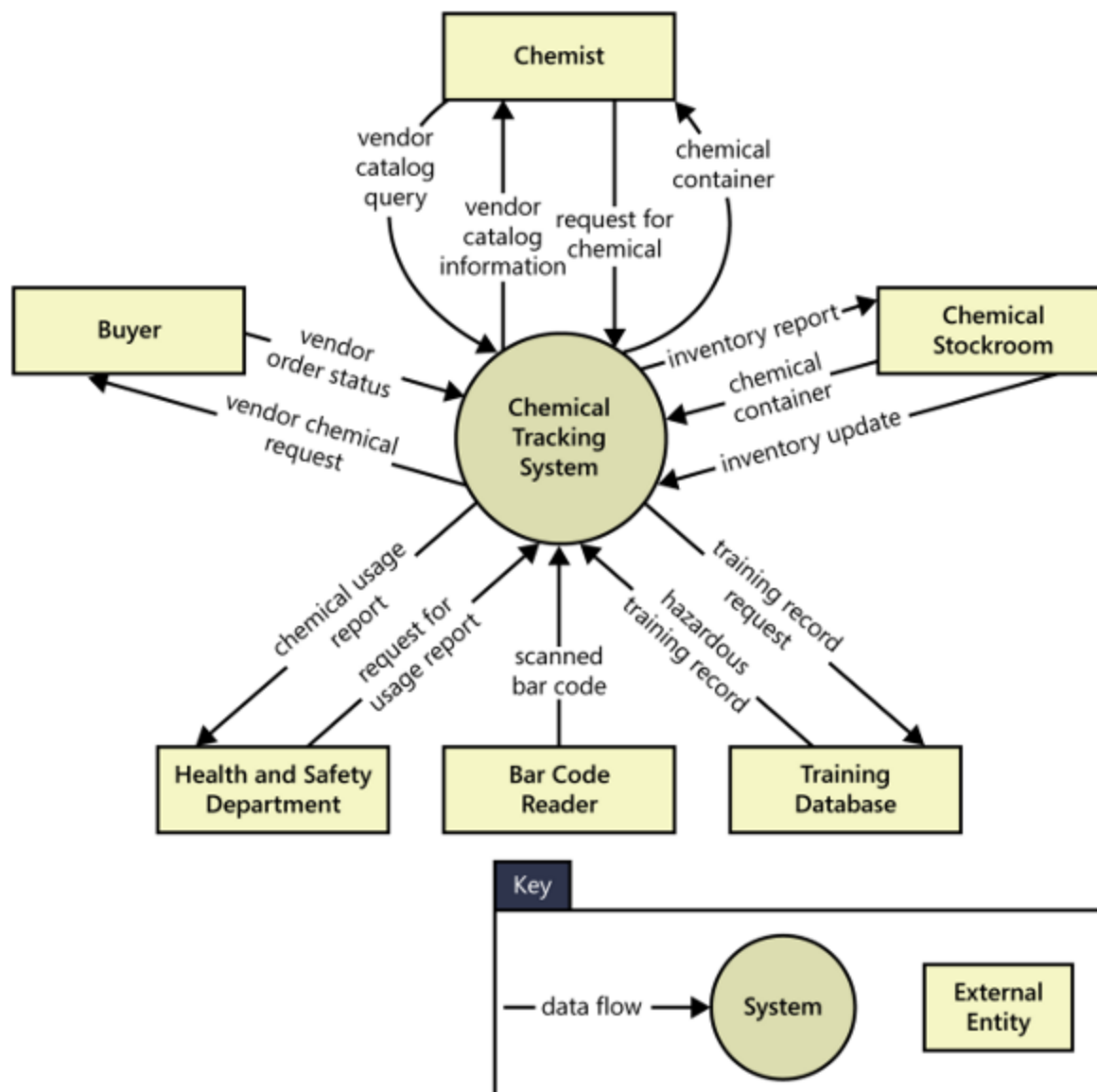
FIGURE 5-6 Partial context diagram for the Chemical Tracking System.

The "system" inside the circle could encompass any combination of software, hardware, and human components (which could include manual operations for the entire system). The external entities in the rectangles can represent user classes, organizations, other systems, or hardware devices. The arrows on the diagram represent the flow of data or physical items between the system and its external entities.

Ecosystem map -

An ecosystem map shows all of the systems related to the system of interest that interact with one another and the nature of those interactions. An ecosystem map represents a scope by showing all the systems that interconnect and that therefore might need to be modified to accommodate your new system. Ecosystem maps differ from context diagrams in that they show other systems that have a relationship with the system you're working on, including those without direct interfaces.
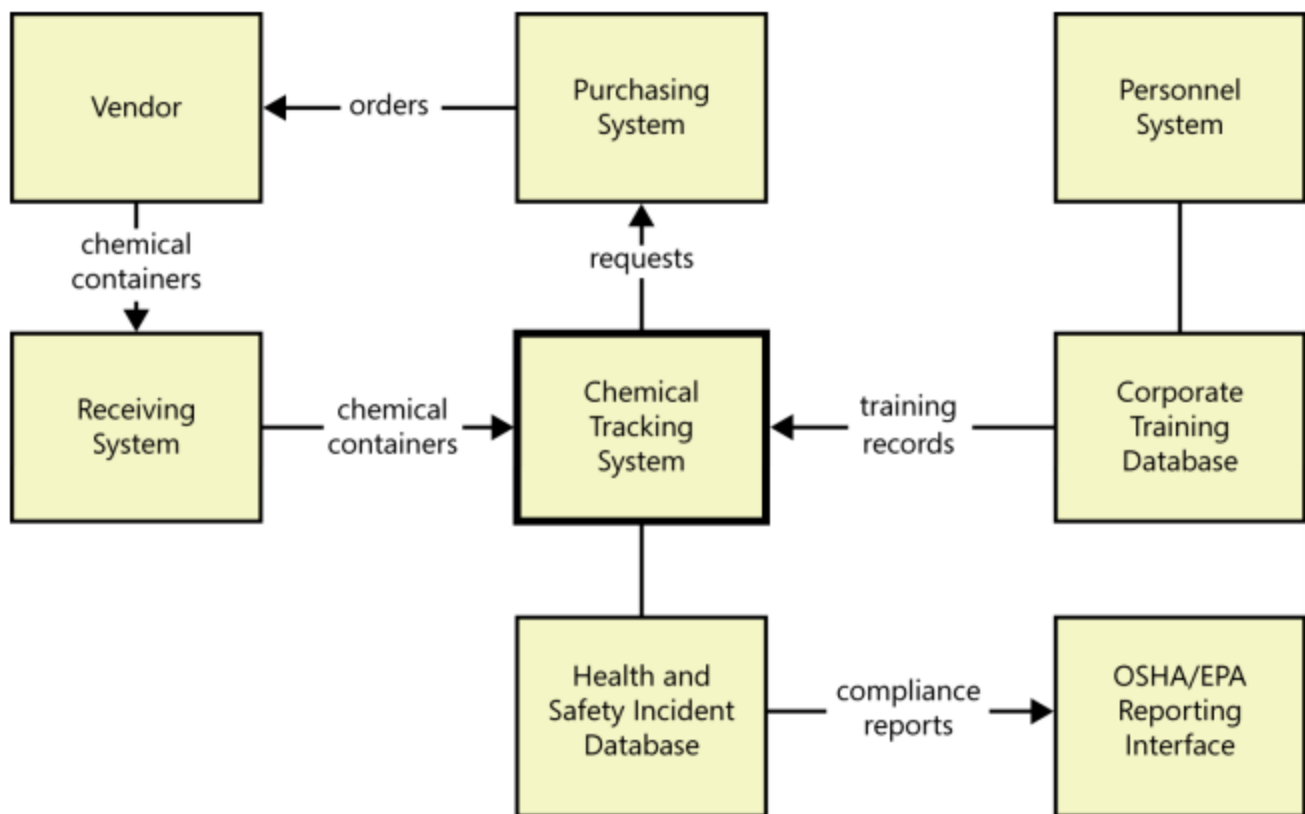
FIGURE 5-7 Partial ecosystem map for the Chemical Tracking System.

The system is all shown in boxes, the primary system we are working on is shown in the bold box, but if all systems have an equal status in your solution, you can use the same box style for all of them. The line show interfaces between the system. Lines with arrows and labels show that major pieces of data are flowing from one system to another.

Feature tree -

A feature tree is a visual description of the product's features organized in logical groups, hierarchically subdividing each feature into further levels of detail. The feature tree provides a concise view of all of the features planned for a project, making it an ideal model to show to executives who want a quick glance at the project scope. A feature tree can show up to three levels of features, commonly called level 1 (L1), level 2 (L2), and level 3 (L3). L2 features are sub-features of L1 features, and L3 features are sub-features of L2 features.
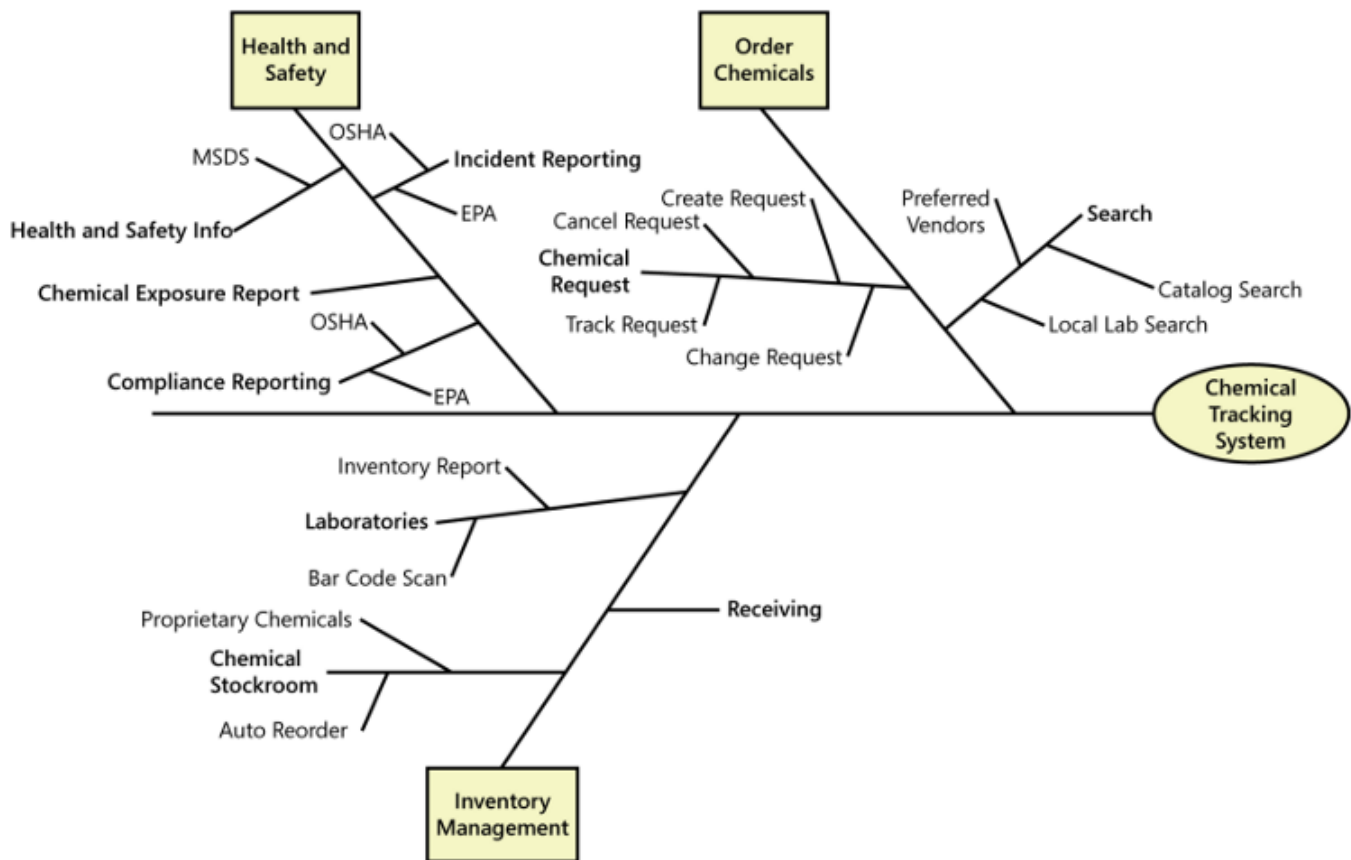
FIGURE 5-8 Partial feature tree for the Chemical Tracking System.

The main branch of the tree in the middle represents the product being implemented. Each feature has its own line or "branch" coming off that central main branch. The gray boxes represent the L1 features, such as Order Chemicals and Inventory Management. The lines coming off an L1 branch are L2 features: Search and chemical requests are sub-features of Order Chemicals. The branches of an L2 branch are the L3 features: Local Lab Search is a sub-feature of Search.

When planning a release or an iteration, you can define its scope by selecting a specific set of features and sub-features to be implemented. Alternatively, you can create a feature roadmap table that lists the sub-features planned for each release.

Event List -

An event list identifies the external events that could trigger behavior in the system. The event list depicts the scope boundary for the system by naming possible business events triggered by users, time-triggered (temporal) events, or signal events received from external components, such as hardware devices. The event list only names the events; the functional requirements that describe how the system responds to the events would be detailed in the SRS by using event-response tables.

External Events for Chemical Tracking System

- Chemist places a chemical request.
- Chemical container bar code is scanned.
- Time to generate OSHA compliance report arrives.
- Vendor issues new chemical catalog.
- New proprietary chemical is accessioned into system.
- Vendor indicates chemical is backordered.
- Chemist asks to generate his chemical exposure report.
- Updated material safety datasheet is received from EPA.
- New vendor is added to preferred vendor list.
- Chemical container is received from vendor.

FIGURE 5-9 Partial event list for the Chemical Tracking System.

Each item in the list states what triggers the event, as well as identifying the event action. An event list is a useful scoping tool because you can allocate certain events to be implemented in specific product releases or development iterations.

Notice that the event list complements the context diagram and ecosystem map. The context diagram and ecosystem map collectively describe the external actors and system involved, whereas the event list identifies what those actors and systems might do to trigger behavior in the system being specified.

You can check the event list against the context diagram and ecosystem map for

correctness and completeness, as follows:

- Consider whether each external entity on the context diagram is the source of any events:

"Do any actions by Chemists trigger behavior in the Chemical Tracking System?"

- Consider whether any systems in the ecosystem map lead to events for your system.
- For each event, consider whether you have corresponding external entities in the context diagram or systems in the ecosystem map: "If a chemical container can be received from a vendor, does Vendor appear in the context diagram and/or ecosystem map?"

Keeping the scope in focus -

A scope definition is a structure, not a straightjacket. The business requirements and an understanding of how customers will use the product provide valuable tools for dealing with scope change. Scope change is not bad if it helps you steer the project toward satisfying evolving customer needs. The information in the vision and scope document lets you assess whether proposed requirements are appropriate for inclusion in the project.

Note, whenever someone requests a new requirement, the analyst needs to ask "Is this in scope?" One response might be that the proposed requirement is clearly out of scope or it is and can it be handled.

Keep a record of why requirements were rejected; they have a way of reappearing.

Using business objectives to make scoping decision:

The business objectives are the most important factor to consider when making scope decisions. Determine which proposed features or user requirements add the most value with respect to the business objectives; schedule those for the early releases. When a stakeholder wants to add functionality, consider how the suggested changes will contribute to achieving the business objectives.

Assessing the impact of scope changes:

When the project's scope increases, the project manager usually will have to renegotiate the

planned budget, resources, schedule, and/or staff. Ideally, the original schedule and resources will accommodate a certain amount of change because of thoughtfully included contingency buffers (Wiegers 2007). Otherwise, you'll need to re-plan after requirements changes are approved.

A common consequence of scope change is that completed activities must be reworked in

response to the changes. Quality often suffers if the allocated resources or time are not increased when new functionality is added. Documented business requirements make it easier to manage legitimate scope growth as the marketplace or business needs change.

Vision and scope on agile projects -

Managing scope on an agile project, in which development is performed in a series of fixed timebox iterations, takes a different approach. The scope of each iteration consists of user stories selected from a dynamic product backlog, based on their relative priority and the estimated delivery capacity of the team for each timebox. Instead of trying to fight scope creep, the team prioritizes new requirements against existing items in the backlog and allocates them to future iterations.

The team can define a high-level roadmap of iterations at the beginning of the project, but the user story allocation for an iteration will be performed at the beginning of each iteration. Referencing the business requirements as the team sets the scope for each iteration helps to ensure that the project delivers a product that meets the business objectives.

Although agile projects might not create a formal vision and scope document, the contents from the template in Figure 5-3 are both relevant and essential to delivering a successful product. Many agile projects conduct an upfront planning iteration (iteration zero) to define the overarching product vision and other business requirements for the project

Business requirements need to be defined for all software projects, regardless of their development approach. The business objectives describe the expected value coming out of the project, and on an agile project, they are used to help prioritize the backlog to deliver the most business value in the earliest iterations. Success metrics should be defined so that as iterative releases go live, the success can be measured and the rest of the backlog adjusted accordingly. A vision statement describes the long-term plan for what the product will be after all iterations are complete.

Using business objectives to determine completion -

How do you know when you can stop implementing functionality? Traditionally, a project manager manages the project towards completion. However, a business analyst is intimately familiar with the business objectives and can help determine when the desired value has been delivered, implying that the work is done.

If you begin with a clear vision for the solution, and if each release or iteration is scoped to deliver just a portion of the total functionality, then you will be done when you complete the preplanned iterations.

However, particularly in iterative development approaches, the endpoint might be vague.

Within each iteration, the scope is defined for that iteration. As the project continues, the backlog of uncompleted work dwindles. It's not always necessary to implement the entire set of remaining functionality. It's critical to have clear business objectives so that you can move toward satisfying those objectives incrementally as information becomes available.

Focus on defining clear business requirements for all of your projects. Otherwise, you are just wandering about aimlessly hoping to accomplish something useful without any way to know if you're reaching your destination.

My Business Analysis

To prepare for the creation of my Business Requirement Specification (BRS), I began by doing a preliminary search on Dell Technologies getting a basic understanding of my sponsor's business and identifying any important facts. I then contacted my sponsor via email with a basis of what I intended on doing with this project and after a couple of days, I received a response which led to the collection of more information. Edward McCarthy a full-time in-house legal counsel for Dell Technologies informed me that his chief responsibilities include providing overall leadership and legal support for Dell Technologies in general, but chiefly one of its wholly-owned subsidiaries, Dell Boomi inc. With this information, we were able to change our focus of this project solely to Dell Boomi inc which led to further research of their website to identify key points such as business purpose, business scope, and so on. This led to a meeting to identify a problem/opportunity within Dell Boomi to extend the information within my BRS. After some communication and clarifications with Edward, I was able to finalize the BRS.

Business Analysis page - Business Analysis