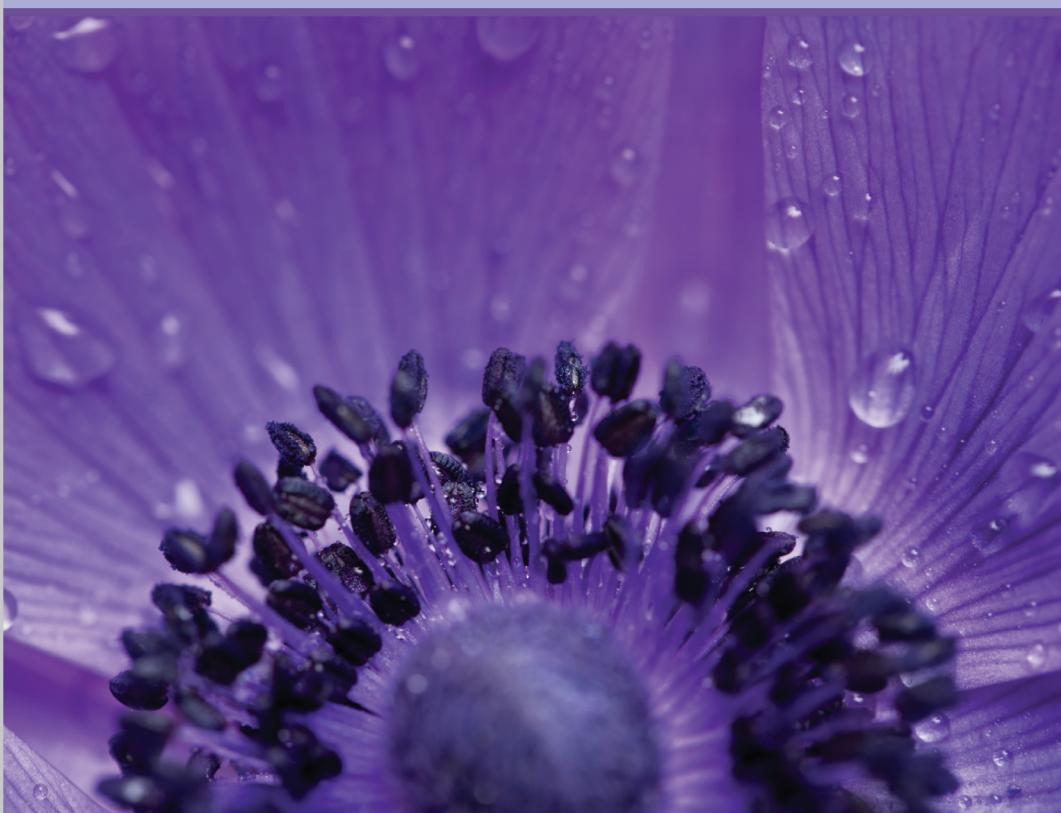


BEST PRACTICE

Foundations of ITIL®

2011 EDITION



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Foundations

of ITIL®

2011 Edition



Colophon

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Foreword

ITIL® is the world's leading framework on IT Service Management. Over the years its adoption has been encouraged by the credibility of its independent owners (the UK Government, specifically the Cabinet Office) and the professional contribution of many international experts. It has become the '*lingua franca*' of the IT Service Management world: a means by which practitioners can develop a first-class service using well understood terms and processes.

The *Foundations of ITIL®* book (and its predecessors) was drafted to create a portable reference book that documented the essentials of the framework. Reflecting the needs of many students and newcomers to the field, it captures the essence of ITIL and shows its context within the wider business. Throughout the years this title has followed the development of the ITIL framework and new revisions have accurately communicated to a global audience the benefits of following this approach.

This latest revision reflects the ITIL® 2011 edition. It follows the established 'Lifecycle Approach' and describes the five key stages and the processes within them. As with all previous editions this title has been the quality result not only of an expert author but also of many QA colleagues around the world who have refined and honed the text. Its quality is reflected in the formal license granted to it by APMG, the official accreditation body of ITIL.

As an independent Advisory Board we always encourage the Publisher to develop products that provide real benefit to the market. We always encourage innovation balanced by the traditional elements of quality and usability. We believe that this book will assist you in achieving your ITIL V3 Foundations Qualification and establishing best practices in IT Service Management in your organization.

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The Foundations of ITIL® is one of the very first publishing concepts we had at Van Haren Publishing. In 2002 ITIL was still in its infancy – yet its potential was clear to many in the industry. A concise reference book was in demand and Van Haren Publishing made the effort to create and publish what was one of the first of many such titles in the marketplace. Since that time Van Haren Publishing has revised and updated its basic title to reflect the new editions of ITIL. On visiting clients and customers we will often see these editions (current and old) well-thumbed and sitting on desk tops or on bookshelves.

So we would like to thank and acknowledge all the contributors to this very special product.

Firstly we would like to thank the author Pierre Bernard. Pierre is a dedicated Service Management expert well known and respected throughout the industry. It is always an honour and privilege to work with such a professional writer – and his great sense of humour makes this project even more of a pleasure.

The reviewers to this title took much time and effort to review an extensive piece of work. Their attention to detail was very professional and the resulting text is, we believe, a very high quality offering thanks to their work. So the Publisher would like to express deep thanks to the following:

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1 Introduction

1.1 Background

During the last decade (2001 – present), technological developments such as smartphones, tablets, cloud services, near-field-content, Wi-Fi, and especially social media have had a tremendous effect on the world we live in. With the emergence of extremely powerful hardware, highly versatile software and super-fast networks, organisations worldwide have been able to develop their information-dependent products and services to a greater extent, and to bring them to the market much faster. These, as well as many other socio-economic and political developments, have marked the superimposition of the **information age** upon the industrial age. In the so-called “*information age*”, where everything is connected, the dissemination of data and information has become faster, more dynamic, as well as a worldwide phenomenon.

Quoting one of Bob Dylan's¹ songs titled “*The Times They Are A-Changin'*” is quite appropriate here, as indeed the traditional view and role of the Information Technology organisation (IT) is dramatically altered based on the above. In order to be successful, organisations will need to be as nimble as possible to react to rapidly changing market demands and technologies. First, there is a movement concerning renaming IT to Information Services (IS). Second, cloud computing is becoming both a more viable option and a more common solution. This is a result of organisations realising that technology is not always their core competency and that outsourcing provides them with a more accurate and predictable cost structure.

Organisations should also start considering the significant impact of the arrival in the workplace of extremely technology-savvy employees. These new employees have been using technology basically since birth and have also been not only the early adaptors of mobile technologies but of social media as well. Information is now at their fingertips and they will expect the same in the workplace. In addition to this new generation of employees, organisations need to consider how they will handle the same demands from their existing and potential customers.

There are a lot of books, whitepapers, and articles² regarding the need to breakdown vertical business silos and shift the business model to more horizontal **processes** thus “flattening” the organisation. The authors of these documents are advocating that decision-making powers be increasingly bestowed on the employees. Again, according to these various sources, an important advantage of process-oriented organisations is that processes can be designed to support a **customer-oriented approach**. This has made the alignment between the IT organisation (responsible for supplying information) and the customer (responsible for using these information

¹ Bob Dylan – American singer, songwriter, musician (1941 –)

² See References section for some examples

systems in their business) increasingly significant. This is usually known as **Business-IT Alignment (BITA)**.

It is against this background that the world of IT Service Management (ITSM) has arisen and gained in popularity.

The above authors are not wrong, nor are they lacking vision; on the contrary. As organisations gained more experience with the **process-oriented approach** of IT service management, it became clear that these processes must be managed coherently. Moreover, it became obvious that the introduction of a process-oriented work method meant a big change for the primarily line and project-oriented organisations. Culture and change management are crucial elements for a successful organisational design. Change management here refers to business change, as well as changes in attitudes, aptitudes, behaviours, and the adoption of frameworks and methodologies adapted to suit the organisational needs.

The truth is that organisations have always used processes and IT is no different. However, one must acknowledge that processes are often conducted in isolation by a few individuals or groups. Processes are often neither shared nor documented. One of the causes for the above is that many people believe that “knowledge is power³”.

Another important lesson learned is that the IT organisation must not lose itself in a process culture. Just like the one-sided project-oriented organisation, a one-sided process-oriented organisation is not the optimum type of business. Balance is, as always, the magic word. In addition, it has become clear that the customer-oriented approach requires that an **end-to-end** and **user-centric** approach must be followed: it is of no help to the user to know that “the server was still in operation” if the information system is not available at the user’s workplace. IT services must be viewed in a larger context. The need for the recognition of the **Service Lifecycle**, and the management of IT services in light of that lifecycle, has become a concern.

Due to the fast growing dependency of business upon information, the quality of information services in companies is being increasingly subjected to stricter **internal and external requirements**. The role of **standards** is becoming more and more important, and **frameworks** of “best practices” help with the development of a management system to meet these requirements. Organisations that are not in control of their processes will not be able to realise great results on the level of the Service Lifecycle and the end-to-end-management of those services. Organisations that do not have their internal organisation in order will also not achieve great results. For these reasons, all these aspects are handled alongside each other in the course of this book.

³ Attributed to Sir Francis Bacon (Viscount of St Alban) 1561 – 1626

1.2 Why this book

This book offers detailed information for those who are responsible for strategic information issues, as well as for the (much larger) group who are responsible for setting up and executing the delivery of the information services. This is supported by both the description of the Service Lifecycle, as documented in ITIL (2007 and 2011 editions), and by the description of the processes and functions that are associated with it. The ITIL core books are very extensive, and can be used for a thorough study of contemporary best practices. This Foundations book provides the reader with an easy-to-read comprehensive introduction to the broad library of ITIL core books, to support the understanding and the further distribution of ITIL as an industry framework. Once this understanding of the structure of ITIL has been gained, the reader can use the core books for a more detailed understanding and guidance for their daily practice.

1.3 Organisations

Several organisations are involved in the maintenance of ITIL as a description of the “best practice” in the IT service management field.

The Cabinet Office

ITIL was initially developed by CCTA, a UK Government Organisation, to help UK Government organisations develop capability, improve efficiency and deploy best practice for IT Service Management. ITIL is now owned by the Cabinet Office, part of the UK Government. The UK Government has made significant investments in developing and maintaining this portfolio of guidance. The Cabinet Office also develops and owns best practice products for portfolio, programme, project, and risk management.

itSMF

The target group for this publication is anyone who is involved or interested in IT service management. A professional organisation, working on the development of the IT service management field, has been created especially for this target group.

In 1991 the Information Technology Service Management Forum (itSMF), originally known as the Information Technology Infrastructure Management Forum (ITIMF), was set up as a UK association. In 1994, a sister association was established in the Netherlands, following the UK example.

Since then, independent itSMF organisations have been set up in more than forty countries, spread across the globe, and the number of “chapters” continues to grow. All itSMF organisations operate under the umbrella organisation, itSMF International (itSMF-I).

The itSMF is aimed at the entire professional area of IT service management. It promotes the exchange of information and experiences that IT organisations can use to improve their service provision. The itSMF is also involved in the use and quality of the various standards and methods that are important in the field. One of these standards is ITIL. The itSMF-I organisation has an agreement with the Cabinet Office and the APM Group on the promotion of the use of ITIL.

The **IT Service Management Forum (itSMF)** is a global, independent, internationally recognised not-for-profit organisation dedicated to IT Service Management. The itSMF is wholly owned and principally run by its membership. It consists of a growing number of national chapters, each with a large degree of autonomy, but adhering to a common code of conduct. The itSMF is a major influence on, and contributor to, industry best practices and standards worldwide, working in partnership with a wide international range of governmental and standards bodies.

itSMF International is the controlling body of the itSMF national chapters and sets policies and provides direction for furthering the overall objectives of itSMF, for the adoption of IT Service Management (ITSM) best practice and for ensuring adherence to itSMF policies and standards.

APM Group

In 2006, OGC contracted the management of ITIL rights, the certification of ITIL exams and accreditation of training organisations to the APM Group (APMG), a commercial organisation. APMG defines the certification and accreditation for the ITIL exams, and published the new certification system (see 2.1: ITIL exams).

Examination institutes

The Dutch Examen Instituut voor Informatica (EXIN) and the English Information Systems Examination Board (ISEB, part of the BCS: the British Computer Society) cooperated in the development and provision of certification for IT service management. For many years they were the only bodies that provided ITIL exams. With the contracting of APMG by OGC in 2006, the responsibility for ITIL exams is now with APMG. To support the world-wide delivery of these ITIL exams, APMG has accredited a number of examination institutes: APMG-International, BCS-ISEB CERT-IT, CSME, DANSK IT, DF Certifiering AB, EXIN, , LCS (Loyalist Certification Services), PEOPLECERT Group and TÜV SÜD Akademie. See www.itil-officialsite.com for the most recent information.

1.4 Differences from previous editions

The “*Foundations of ITIL®*” book has played a key role in the distribution of ideas on IT service management and ITIL for years. The title has been translated into thirteen languages and is recognised as the most practical introduction to the leading “best practices” in this field. Earlier editions of the Foundations book focused on the content of three books from the ITIL series (version 2): Service Support, Service

Delivery, and Security Management, and placed them in a broader context of quality management.

The main difference between ITIL version 2 and 3 lies in the service lifecycle, introduced in version 3. Where the Foundations scope of version 2 focused on single practices, clustered in Delivery, Support, and Security Management, the scope in version 3 takes the entire Service Lifecycle into account.

As a result of continuous development of best practices, some terms have disappeared between the introduction of ITIL version 2 and 3, and a significant number of new terms have been added to version 3. As many of these concepts are part of the scope of an IT service management training or exam, they have been included in the relevant descriptions. For a definitive list of concepts, readers should refer to the various training and exam programs. In 2011 a second edition of ITIL V3 was published. This new edition is comprised mostly of cosmetic, grammatical, and syntactic modifications. The list of these changes is summarised in Appendix B – ITIL 2011 Summary of Updates.

For the purpose of simplification, it is highly recommended to use the generic term ITIL instead of ITIL V3 or ITIL V3:2007 or ITIL V3:2011. Although this book is indeed about the ITIL V3:2011 edition, the term ITIL is used throughout the book to simplify matters and to lighten the text.

1.5 Structure of the book

This book starts with an introduction on the backgrounds and general principles of IT service management and the context for ITIL (**Chapter 1**). It describes the parties involved in the development of best practices and standards for IT service management, and the basic premises and standards that are used.

The body of the book is set up in two major parts:

Part 1, made up of *Chapters 2 and 3*, introduces the Service Lifecycle, in the context of IT service management and IT governance. It discusses principles of organisational maturity, and the benefits and risks of following a service management framework. It introduces and discusses the functions involved in service management good practices. This enables the reader to better relate the processes in Part 2, and their related concepts and activities back to the people aspect of service management.

In **Part 2**, made up of **Chapters 4 to 8**, each of the phases in the Service Lifecycle is discussed in detail, in a standardised structure: Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement. These chapters provide a detailed view on the characteristics of the Service Lifecycle, its construct and its elements. The main points of each phase are presented in a

consistent way to aid readability and clarity, so that the text is clear and its readability is promoted.

Each of these processes and functions is described in terms of:

- Introduction
- Basic concepts
- Activities, methods and techniques
- Management information and interfaces
- Triggers, inputs, and outputs
- Critical Success Factors and metrics
- Challenges and risks

The **Appendices** provide useful sources for the reader. A reference list of the sources used is provided, as well as the official ITIL Glossary. The book ends with an extensive index of terms that will support the reader in finding relevant text elements.

1.6 How to use this book

Readers who are primarily interested in the Service Lifecycle can focus on Part 1 of the book, and pick whatever they need on functions from Part 1 and processes from Part 2.

Readers who are primarily interested in the functions and processes and are not ready for a lifecycle approach yet, or who prefer a process approach, can read the introductory chapters, and then focus on the functions and processes of their interest.

Readers who want a thorough introduction to ITIL, exploring its scope and main characteristics, can read Part 1 on the Lifecycle, and add as many of the processes from Part 2 as they need or like.

In this way, this new edition of the Foundations book aims to provide support to a variety of approaches to IT Service Management based on ITIL.

PART 1: THE ITIL SERVICE LIFECYCLE

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2 Introduction to the service lifecycle

2.1 Introduction to ITIL®

In 2007 a new edition of the ITIL framework, known as version 3, was published. This new version took a dramatic new approach for service management. In addition to the process approach, ITIL V3 incorporated the concept of the service lifecycle. Then in 2011 a revision of the 2007 edition was published.

ITIL 2011 is an update and is also designed to:

- Resolve any errors or inconsistencies in the text and diagrams, both in content and presentation
- Improve the publications by addressing issues raised in the Change Control Log, as analysed and recommended by the change advisory board (CAB) and approved by the Cabinet Office. These are largely to do with clarity, consistency, correctness and completeness
- Address suggestions for change made by the training community to make ITIL easier to teach
- Review the ITIL Service Strategy publication to ensure that the concepts are explained in the clearest, most concise and accessible way possible

ITIL offers a systematic approach to the delivery of quality of IT services. It provides a detailed description of most of the important processes for an IT organisation, and includes information about procedures, tasks, roles, and responsibilities. These can be used as a basis for tailoring the framework to the needs of individual organisations.

At the same time, the broad coverage of ITIL also provides a helpful reference guide for many areas, which can be used to develop new improvement goals for an IT organisation, enabling it to grow and mature.

Over the years, ITIL has become much more than a series of useful books about IT service management. The framework for the “best practice” in IT service management is promoted and further developed and influenced by advisors, educators, trainers, and suppliers. These suppliers include a wide variety of technological solutions such as hardware, software, and cloud computing products. Since the 1990s, ITIL has grown from a theoretical framework to the de facto approach and philosophy shared by the people who work with it in practice.

Being an extended framework of best practices for IT service management itself, the advantages and disadvantages of frameworks in general, described in Section 2.4, are also applicable to ITIL. Of course, ITIL was developed because of the advantages

mentioned earlier. Many of the pointers from “best practices” are intended to avoid potential problems or, if they do occur after all, to solve them.

ITIL examinations

Due to the new 2011 edition of ITIL, the syllabuses for all qualifications have been updated. The most significant changes relate to new/modified section numbers as well as improved wording and/or clarification for some learning objectives and section details.

At the publication date of this book, well over two million people worldwide have achieved one or more levels of ITIL certification.

There are four qualification levels in regards to the ITIL framework. They are:

- Foundation Level
- Intermediate Level (Lifecycle Stream & Capability Stream)
- ITIL Expert
- ITIL Master

For more information about the ITIL Qualification Scheme, please see:

<http://www.itil-officialsite.com/Qualifications/ITILV3QualificationScheme.asp>

2.2 IT governance

As the role of information, information services, and ITSM grows, so do the management requirements for the IT organisation. These requirements focus on two aspects. The first is the compliance with internal and external policies, laws, and regulations. The second is the provision of benefits (value-add proposition) for the stakeholders of the organisation. Although it is a relatively young discipline, IT governance is receiving far greater scrutiny than already established standards and frameworks. A definition for IT governance receiving a lot of support is from Van Grembergen:

IT governance consists of a comprehensive framework of structures, processes, and relational mechanisms. Structures involve the existence of responsible functions such as IT executives and accounts, and a diversity of IT Committees. Processes refer to strategic IT decision-making and monitoring. Relational mechanisms include business/IT participation and partnerships, strategic dialogue and shared learning.

From the definition above we can see that governance enables the creation of a setting in which others can manage their tasks effectively¹. IT governance and IT management, then, are two separate entities. Since ITSM is focused on managing quality IT services it can be considered to be part of the IT management domain. That leaves IT governance in the business or information management domain.

Although many frameworks are characterised as “IT Governance frameworks”, such as CobIT® and even ITIL, most of them are in fact management frameworks. The International Organisation for Standardisation (ISO®) introduced in 2008 a standard for corporate governance of information technology; ISO/IEC38500:2008.

The ITIL framework approaches governance from the following perspective.

Governance is the single overarching area tying IT and the business together. Governance defines the common directions, policies, and rules used by the whole organisation to conduct business.

ITIL's definition of governance

“Governance ensures that policies and strategy are actually implemented and that required processes are correctly followed. Governance includes defining roles and responsibilities, measuring and reporting, and taking actions to resolve any issues identified.”

2.3 Organisational maturity

From the moment Richard Nolan introduced his “staged model” for the application of IT in organisations in 1973 many people have used stepwise improvement models. These models were quickly recognised as suitable instruments for quality improvement programs, thereby helping organisations to climb up the maturity ladder.

Dozens of variations on the theme can easily be found, ranging from trades such as software development, acquisition, systems engineering, software testing, website development, data warehousing and security engineering, to help desks and knowledge management. Obviously the *Kaizen* principle (improvement works best in smaller steps) was one that appealed to many people.

After Nolan's staged model in 1973, the most appealing application of this modelling was found when the Software Engineering Institute (SEI) of Carnegie Mellon University, USA, published its Software Capability Maturity Model (SW-CMM®). The CMM® was copied and applied in most of the cases mentioned above, making CMM something of a standard in maturity modelling. The CMM was later followed by newer editions, including CMMI® (CMM Integration).

¹ Sohal & Fitzpatrick

Later, these models were applied in quality management models, such as the European Foundation for Quality Management (EFQM®). Apart from the broad quality management models, there are several other industry accepted practices, such as Six Sigma and Total Quality Management (TQM®) which are complementary to ITIL.

The available standards and frameworks of best practice offer guidance for organisations in achieving “operational excellence” in IT service management. Depending upon their stage of development, organisations tend to require different kinds of guidance.

Maturity model: CMMI

In the IT industry, the process maturity improvement process is best known in the context of the **Capability Maturity Model Integration (CMMI)**. This process improvement method was developed by SEI. CMMI provides both a staged and a continuous model. In the continuous representation, improvement is measured using capability levels and maturity is measured for a particular process across an organisation.

The capability levels in the **CMMI continuous representation** are shown in the table below.

Table 2.1 CMMI Capability levels

1. Incomplete process	A process that either is not performed or partially performed
2. Performed process	Satisfies the specific goals of the process area
3. Managed process	A performed (capability level 1) process that has the basic infrastructure in place to support the process
4. Defined process	A managed (capability level 2) process that is tailored from the organisation's set of standard processes according to the organisation's tailoring guidelines, and contributes work products, measures and other process improvement information to the organisational process assets
5. Quantitatively managed process	A defined (capability level 3) process that is controlled using statistical and other quantitative techniques
6. Optimising process	A quantitatively managed (capability level 4) process that is improved based on an understanding of the common causes of variation inherent in the process

In the staged representation, improvement is measured using maturity levels, for a set of processes across an organisation. The **CMMI staged representation** model defines five maturity levels, each a layer in the base for the next phase in the on-going process improvement, designated by the numbers 1 through 5:

Table 2.2 CMMI maturity levels

1. Initial	Processes are ad hoc and chaotic
2. Managed	The projects of the organisation have ensured that processes are planned and executed in accordance with policy
3. Defined	Processes are well characterised and understood, and are described in standards, procedures, tools and methods
4. Quantitatively managed	The organisation and projects establish quantitative objectives for quality and process performance, and use them as criteria in managing processes
5. Optimising	Focuses on continually improving process performance through incremental and innovative process and technological improvements

Many other maturity models were based on these structures, such as the Gartner Maturity Models. Most of these models are focused at capability maturity. Some others, like KPMG's World Class IT Maturity Model, take a different approach.

Standard: ISO/IEC 20000®

Developing and maintaining a quality system which complies with the requirements of the ISO 9000 (ISO-9000:2000®) series can be considered a tool for the organisation to reach and maintain the system-focused (or "managed" in IT Service CMM) level of maturity. These ISO standards emphasise the definition, description, and design of processes. For IT service management organisations, a specific ISO standard was produced: the ISO/IEC 20000 (see Figure 2.1). This does not replace ISO 9000; it

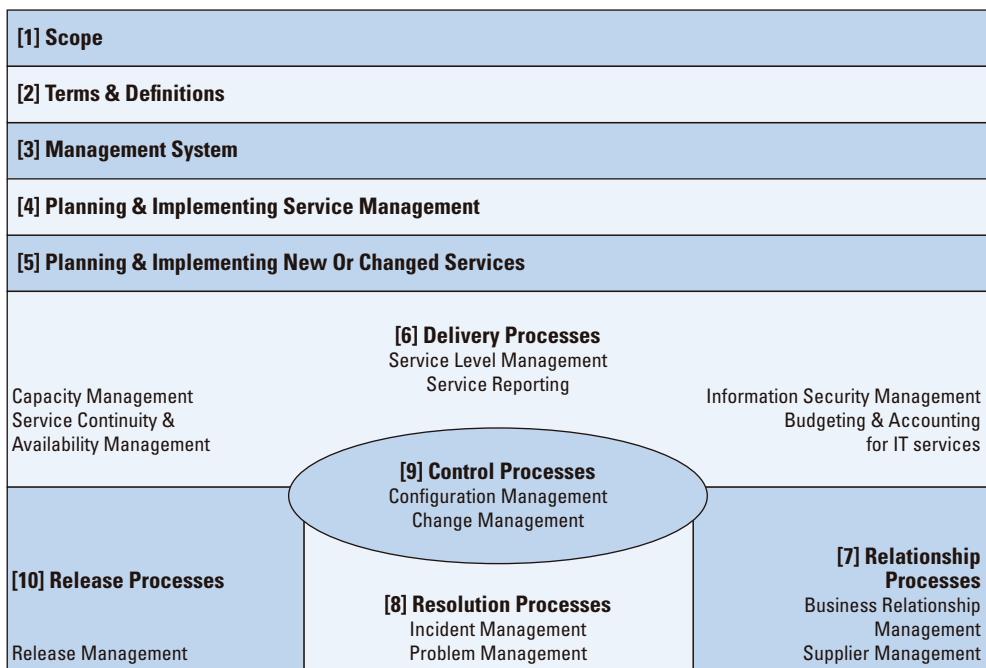


Figure 2.1 Overview of the ISO/IEC 20000 service management system

complements it by focusing on the specific requirements of a management system for IT service management.

Customer maturity

When assessing the maturity of an organisation, we cannot restrict ourselves to the service provider. The **level of maturity of the customer** is also important. If there are large differences in maturity between the provider and the customer, then these will have to be considered to prevent a mismatch in the approach, methods, and mutual expectations. Specifically, this affects the communication between the customer and the provider.

2.4 Benefits and risks of ITSM frameworks

The list below identifies some benefits and possible problems of using IT service management best practices. This list is not intended to be definitive, but is provided here as a basis for considering some of the benefits that can be achieved and some of the mistakes that can be made when using common process-based IT service management frameworks:

Benefits to the customer/user:

- The provision of IT services becomes more customer-focused and agreements about service quality improve the relationship
- The services are described better, in customer language, and in more appropriate detail
- Management of service quality, availability, and reliability and service costs is improved
- Communication with the IT organisation is improved by agreeing on the points of contact

Benefits to the IT organisation:

- The IT organisation develops a clearer structure, becomes more efficient, and is more focused on the corporate objectives
- The IT organisation is more in control of the infrastructure and services it has responsibility for, and changes become easier to manage
- An effective process structure provides a framework for the effective outsourcing of elements of the IT services
- Following best practices encourages a cultural change towards providing services, and supports the introduction of quality management systems based on the ISO 9000 series or on ISO/IEC 20000
- Frameworks can provide coherent frames of reference for internal communication and communication with suppliers, and for the standardisation and identification of procedures

Potential problems/mistakes:

- The introduction can take a long time and require significant effort, and may require a change of culture in the organisation; an overambitious introduction can lead to frustration because the objectives are never met
- If process structures become an objective in themselves, the service quality may be adversely affected; in this scenario, unnecessary or over-engineered procedures are seen as bureaucratic obstacles, which are to be avoided where possible
- There is no improvement in IT services due to a fundamental lack of understanding about what the relevant processes should provide, what the appropriate performance indicators are, and how processes can be controlled
- Improvement in the provision of services and cost reductions are insufficiently visible, because no baseline data was available for comparison and/or the wrong targets were identified
- A successful implementation requires the involvement and commitment of personnel at all levels in the organisation, particularly the executives and the senior management teams; leaving the development of the process structures to a specialist department may isolate that department in the organisation and it may set a direction that is not accepted by other departments
- If there is insufficient investment in appropriate training and support tools, justice will not be done to the processes and the service will not be improved; additional resources and personnel may be needed in the short term if the organisation is already overloaded by routine IT service management activities which may not be using “best practices”

2.5 Service Lifecycle: concept and overview

The information provision role and system has grown and changed since the launch of ITIL version 2 (between 2000 and 2002). IT supports and is part of an increasing number of goods and services. In the business world, the information provision role has changed as well: the role of the IT organisation role is no longer just supporting, but has become the baseline for the creation of business value.

ITIL intends to include and provide insight into the new role of IT in all its complexity and dynamics. To that end, a new service management approach has been chosen that does not centre on processes, but focuses on the Service Lifecycle.

Basic concepts

Before we describe the Service Lifecycle, we need to define some basic concepts.

Best practice

ITIL is presented as a best practice. This is an approach or method that has proven itself in practice. These best practices can be a solid backing for organisations that want to improve their IT services. In such cases, the best thing to do is to select a generic standard or method that is accessible to everyone, ITIL, CobiT®, CMMI, PRINCE2®, and ISO/IEC 20000, for example. One of the benefits of these freely accessible generic

standards is that they can be applied to several real-life environments and situations. There is also ample training available for open standards. This makes it much easier to train personnel.

Another source for best practice is proprietary knowledge. A disadvantage of this kind of knowledge is that it may be customised for the context and needs of a specific organisation. Therefore, it may be difficult to adopt or replicate and it may not be as effective in use.

Service

A service is about creating value for the customer. ITIL defines a service as follows:

"A service is a means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks."

The following table provides further explanations regarding the above definition.

Table 2.3 Definition of key terms in the service definition

Means:	The actual “physical” product the customer can actually see, touch, or use
Value:	The customer defines value based on desired business outcomes, their preferences and their perceptions
Outcome:	The business activity or result to be used by the business or delivered to the external customer.
Specific costs:	The customer does not want to worry about all costs regarding the end-to-end provision of the service. The customer prefers to consider IT as a utility which is a more predictable expense.
Specific risks:	The IT organisation takes on most of the risks on behalf of the customer allowing the latter to focus on their core business competencies.

Outcomes are possible from the performance of tasks, and they are limited by a number of constraints. Services enhance performance and reduce the pressure of constraints. This increases the chances of the desired outcomes being realised.

Value

Value is the core of the service concept. From the perspective of the IT organisation value consists of two core components: utility and warranty. Utility is what the customer receives, and warranty is how it is provided. The concepts utility and warranty are described in the section “Service Strategy”.

Service management

ITIL defines service management as follows:

"Service management is a set of specialised organisational capabilities for providing value to customers in the form of services."

"Service provider: An organisation supplying services to one or more internal or external customers."

Service management is also a body of knowledge through all of the existing books, whitepapers, articles, studies, and conferences. It is also a professional practice based on proven practices which includes multiple frameworks and methodologies

Systems

ITIL's definition of a system is:

"A system is a group of, interrelating, or interdependent components that form a unified ensemble, operating together for a common purpose."

Feedback and learning are two key aspects in the performance of systems; they turn processes, functions, and organisations into dynamic systems. Feedback can lead to learning and growth, not only within a process, but also within an organisation in its entirety.

Within a process, for instance, the feedback about the performance of one cycle is, in its turn, input for the next process cycle. Within organisations, there can be feedback between processes, functions, and lifecycle phases. Behind this feedback is the common goal: the customer's objectives.

Functions and processes

It is of the utmost importance for anyone in an organisation, especially in the IT organisation, to understand the difference between a function and a process.

A **function** is a subdivision of an organisation that is specialised in fulfilling a specified type of work, and is responsible for specific end results. Functions are semi-autonomous groupings with capabilities and resources that are required for their performance and results. They have their own set of tasks, roles, and areas of responsibility as well as their own body of knowledge.

What is a process?

A **process** is a structured set of activities designed to accomplish a defined objective. Processes result in a goal-oriented change, and utilise feedback for self-enhancing and self-corrective actions. Processes simply group together related activities to simplify and unify their execution and accomplishment.

Processes possess the following characteristics:

Table 2.4 The four characteristics of processes

Measurable	They are measurable because it is possible to set specific targets related to the process performance and measure against them: i.e.: they are performance-oriented
Specific results	They produce specific results in the form of defined outputs at the right time and the right level of quality
Customers and/or stakeholders	They provide results to identified customers and/or stakeholders
Respond to specific trigger	They respond to specific triggers. A process is indeed continual and iterative, but it always originates from a certain identified trigger.

For some people, it may be difficult to differentiate between a function and a process. The difficulty arises when an organisation already has a group of people called by the name of a process. This group is usually dedicated primarily to the execution of what appears to be a single process. However, every group of people is involved in the execution of process activities.

Basically, in and of themselves, processes do nothing. People (and tools) execute the activities of various processes.

Based on the above definitions, a function (group of people) performs the activities of various processes. A good example of a function is a service desk; a good example of a process is change management.

A poor coordination between functions combined with an inward focus leads to the rise of silos. This does not benefit the success of the organisation. Processes run through the hierarchical structure of functions; functions often share many processes. This is how processes contribute to an ever improved coordination between functions.

The Service Lifecycle

ITIL approaches service management from the lifecycle of a service. The Service Lifecycle is an organisation model providing insight into:

- The way service management is structured
- The way the various lifecycle components are linked to each other
- The impact that changes in one component will have on other components and on the entire lifecycle system

ITIL focuses on the Service Lifecycle, and the way service management components are linked. Each phase of the lifecycle describes the processes most relevant to that phase.

The Service Lifecycle consists of five phases. Each core volume describes one of these phases:

Table 2.5 The five stages of the service lifecycle

Service Strategy	The phase of defining the guidelines for creating business value and achieving and maintaining a strategic advantage
Service Design	The phase of designing and developing appropriate IT services, including architecture, processes, systems and tools for ITSM, measures and metrics, policy and documents, in order to meet current and future business requirements
Service Transition	The phase of planning and managing the realisation of new and modified services according to customer specifications
Service Operation	The phase of managing and fulfilling all activities required to provide and support services, in order to ensure value for the customer and the service provider
Continual Service Improvement	The phase of continual improvement of the effectiveness and efficiency of IT services against business requirements

Service Strategy is the axis of the Service Lifecycle (Figure 2.2) that “binds” all other phases. This phase defines perspective, position, plans, patterns, and policies. The phases Service Design, Service Transition, and Service Operation transform the strategy into reality; their continual theme is adjustment and change. The Continual Service Improvement phase stands for learning and improving, and embraces all phases. This phase analyses and initiates improvement programs and projects, and prioritises them based on the strategic objectives of the organisation.

The Service Lifecycle is a combination of many perspectives on the reality of organisations. This offers more flexibility and control.

The dominant theoretical pattern in the Service Lifecycle is the succession of Service Strategy to Service Design, to Service Transition and to Service Operation, and then, through Continual Service Improvement, back to Service Strategy, and so on. In practice, all phases occur iteratively for the management of a particular service. Moreover, the cycle encompasses many concurrent patterns as organisations already have services in stages. All organisations have services at the concept/idea stage, while some are being designed (either new or modified), some are in transition, some are in operation, and some are being investigated for improvement opportunities.

Regardless of tasks, roles, or responsibilities all IT personnel should focus on the service lifecycle first, and foremost. In order to accomplish that they will have to use a process approach to their day-to-day activities; this will include dealing with various technologies and applications. It is important for all IT personnel, including management, to understand what the present deliverables are. At different times,

people are involved with various processes in all five phases. More details are provided later in this book.

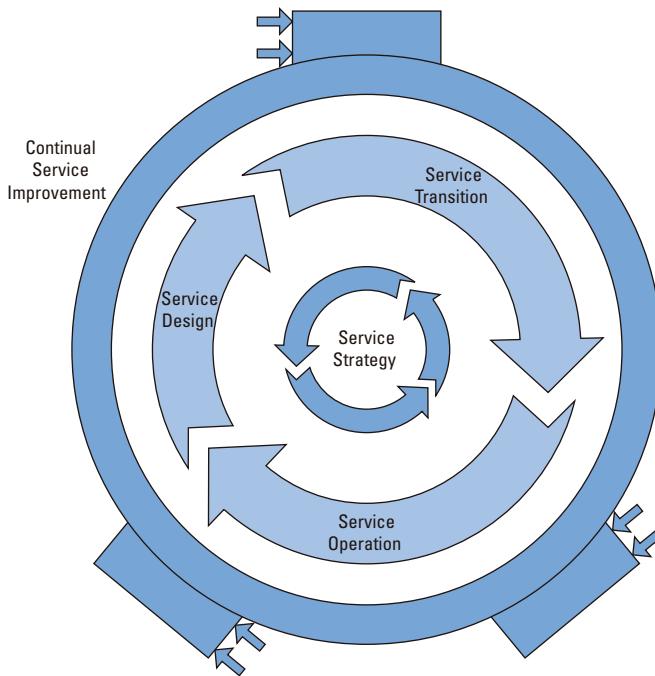


Figure 2.2 The service lifecycle

Source: The Cabinet Office

ITIL Library

The IT Infrastructure Library² (ITIL) encompasses the following components:

Core Library – the five Service Lifecycle publications:

- Service Strategy
- Service Design
- Service Transition
- Service Operation
- Continual Service Improvement

Each book covers a phase from the Service Lifecycle and encompasses various processes. The processes are always described in detail in the book in which they find their key application.

² The use of the complete definition for the ITIL acronym has been discontinued.

3 Introduction to service management

3.1 Service management as a practice

Before we define what a service is, a few terms need to be defined first. The difficulty with trying to describe terms in a framework is their circular nature. As a term is defined, it often introduces terms yet undefined.

Utility and warranty

From the customer's point of view, value is subjective. Although at its core value consists of achieving business objectives, it is influenced by the customer's perceptions and preferences. From a service provider point of view, the value of a service is created by combining two primary elements: utility (fitness for purpose) and warranty (fitness for use). These two elements work together to achieve the desired outcomes upon which the customer and the business base their perceptions of a service.

The value of a service can be considered to be the level to which that service meets a customer's expectations. It is often measured by how much the customer is willing to pay for the service, rather than the cost to the service provider of providing the service or any other intrinsic attribute of the service itself.

Utility is the functionality offered by a product or service to meet a particular need. Utility can be summarised as 'what the service does', or 'fit for purpose'. Utility refers to those aspects of a service that contribute to tasks associated with achieving outcomes; the removal of constraints and an increase in performance.

Warranty is an assurance that a product or service will meet its agreed requirements. Warranty refers to the ability of a service to be available when needed, to provide the

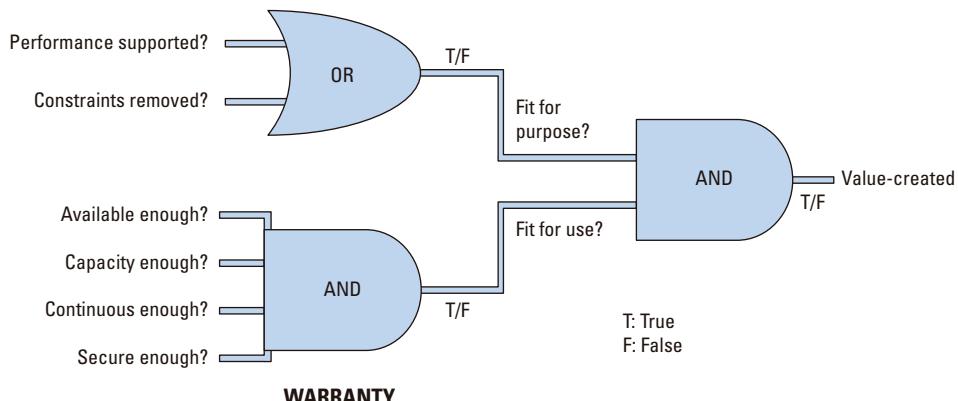


Figure 3.1 Services: designed, built and delivered with both utility and warranty

Source: The Cabinet Office

required capacity, and to provide the required reliability in terms of continuity and security. Warranty can be summarised as ‘how the service is delivered’ or ‘fit for use’.

Services and service management

A service is a means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks. To increase the probability of the desired outcomes, services enhance the performance of associated tasks and reduce the effect of various constraints.

Outcome: The result of carrying out an activity, following a process, or delivering an IT service etc. The term is used to refer to intended results, as well as to actual results.

Service: A means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks.

IT service: A service provided by an IT service provider. An IT service is made up of a combination of information technology, people, and processes.

Services can be discussed in terms of how they relate to one another and their customers, and can be classified as core, enabling or enhancing.

Core services: delivers the basic outcomes desired by one or more customers. The core services solidify the customer’s value proposition and provide the basis for the continued optimisation of the service thus leading to customer satisfaction.

Enabling services: are services required for the successful delivery of a core service. Although enabling services may or may not be visible to the customer, the customer does not perceive them as services in their own right but as being component of the core service.

Enhancing services: are services that are added to a core service to make it more exciting or enticing to the customer. Although enhancing services are non-essential for the successful delivery of a core service, they add value to the core service.

To achieve economies of scales as well as increasing cost effectiveness, services are often “bundled” or “grouped” together. The service provider thus offers various *service packages*. A service package is a collection of two or more services (that can consist of a combination of core services, enabling services and enhancing services) which have been combined to help deliver specific business outcomes.

A service or a service package can be offered with different levels of utility and warranty to create service options. These different service options are called *service level packages*.

Service management

In order to offer and provide services, the service provider must effectively and efficiently manage the entire lifecycle of the services. This can be accomplished

by using an approach called service management. Service management is a set of specialised organisational capabilities for providing value to customers in the form of services. Transforming the service provider's capabilities and resources into valuable services is the core of service management. Service management is also a professional practice supported by an extensive body of knowledge, experience, and skills.

Service management: A set of specialised organisational capabilities for providing value to customers in the form of services

Service provider: An organisation supplying services to one or more internal or external customers

IT service management

An IT organisation is, by definition, a service provider. It uses the principles of service management to ensure the successful delivery of the outcomes desired by the customers.

IT service management (ITSM): The implementation and management of quality IT services that meet the needs of the business. IT service management is performed by IT service providers through an appropriate mix of people, process, and information technology.

IT service provider: A service provider that provides IT services to internal or external customers.

The IT service provider must utilise ITSM effectively and efficiently. By managing IT from the business perspective (as opposed to simply being a technology broker) the IT service provider will generate higher organisational performance and create greater value.

Service providers

There are three main types of service provider. Although almost all aspects of service management apply equally to all types of service provider, there are certain aspects that take on different meanings depending on the type of provider. These aspects include terms such as customers, contracts, competition, market spaces, revenue, and strategy.

Table 3.1 Service provider types

Type I Internal service provider	An internal service provider that is embedded within a business unit. There may be several Type I service providers within an organisation
Type II Shared services unit	An internal service provider that provides shared IT services to more than one business unit
Type III External service provider	A service provider that provides IT services to external customers

Stakeholders in service management

A stakeholder is an individual or a group that has a vested interest in an organisation, project, service, etc. Of interest to the stakeholders are such service management deliverables as activities, targets, resources, etc.

Table 3.2 Stakeholders

Customers	Those who buy goods or services. The customer of an IT service provider is the person or group who defines and agrees the service level targets.
Users	Those who use the service on a day-to-day basis. Users are distinct from customers, as some customers do not use the IT service directly.
Suppliers	Third parties responsible for supplying goods or services that are required to deliver IT services
Internal customers	These are customers who work for the same organisation as the IT service provider. Any internal department is an internal customer of the IT organisation because it uses IT services.
External customers	These are customers who work for a different organisation from the IT service provider. External customers typically purchase services from the service provider by means of a legally binding contract or agreement. External customers may also be customers of the organisation. They directly interact with the technological aspect of the service.

Assets, resources, and capabilities

The use of assets forms the basis for the relationship between service providers and their customers. Each relationship involves an interaction between the assets of each party.

Asset: Any resource or capability

Customer asset: Any resource or capability used by a customer to achieve a business outcome

Service asset: Any resource or capability used by a service provider to deliver services to a customer.

Without customer assets, there is no basis for defining the value of a service. The performance of customer assets is therefore a primary concern of service management.

Resources and capabilities are two types of asset used by both service providers and customers. Resources are direct inputs for production; they are “consumed” or “modified”. Capabilities represent an organisation’s ability to coordinate, control, and deploy the resources.

Processes

Process: A process is a structured set of activities designed to accomplish a specific objective. A process takes one or more defined inputs and turns them into defined outputs.

Processes define actions, dependencies, and sequence. Process characteristics include:

Table 3.3 Process characteristics

Measurability	We are able to measure the process in a relevant manner. It is performance-driven. Managers want to measure cost, quality and other variables while practitioners are concerned with duration and productivity.
Specific results	The reason a process exists is to deliver a specific result. This result must be individually identifiable and countable.
Customers	Every process delivers its primary results to a customer or stakeholder. Customers may be internal or external to the organisation, but the process must meet their expectations.
Responsiveness to specific triggers	While a process may be on-going or iterative, it should be traceable to a specific trigger.

A process is organised around a set of objectives. The main outputs from the process should be driven by the objectives and should include process measurements (metrics), reports, and process improvement.

3.2 Organising for service management

There is no single best way to organise service management, and best practices described in ITIL need to be tailored to suit individual organisations and situations.

Functions

A function is a team or group of people and the tools or other resources they use to carry out one or more processes or activities.

ITIL defines four functions as follows.

Table 3.4 The four functions

Service desk	This function acts as the single point of contact and communication to the users and a point of coordination for several IT groups and processes
IT operations management	This function executes the daily operational activities needed to manage IT services and the supporting IT infrastructure. IT operations management has two sub-functions; IT operations control and facilities management.
Technical management	This function provides detailed technical skills and resources needed to support the on-going operation of IT services and the management of the IT infrastructure. Technical management also plays an important role in the design, testing, release, and improvement of IT services.
Application management	This function is responsible for managing applications throughout their lifecycle. The application management function supports and maintains operational applications. Application management also plays an important role in the design, testing, release, and improvement of IT services.

Roles

Roles are often confused with job titles. However, they are not the same. Each organisation must define appropriate job titles and job descriptions to suit their needs. Individuals holding these job titles can perform one or more of the required roles.

Role: A role is a set of responsibilities, activities, and authorities granted to a person or team.

A role is defined in a process or function. One person or team may have multiple roles.

An organisation needs to define clearly the roles and responsibilities required to undertake the processes and activities involved in each lifecycle stage. Roles are assigned to individuals, and a structure of teams, groups, or functions.

Table 3.5 Organisational structure breakdown

Group	A group is a number of people who are similar in some way
Team	A team is a more formal type of group. These are people who work together to achieve a common objective, but not necessarily in the same organisational structure
Department	Departments are formal hierarchical, organisational-reporting structures which exist to perform a specific set of defined activities on an on-going basis
Division	A division refers to a number of departments that have been grouped together, often by geography or product line

Organisational culture and behaviour

Organisational culture is the set of shared values and norms that control the interactions between a service provider and all stakeholders, including customers, users, suppliers, internal personnel etc. An organisation's values are desired modes of behaviour that affect its culture. Examples of organisational values include high standards, customer care, respecting tradition and authority, acting cautiously and conservatively, and being frugal.

Constraints such as governance, standards, values, capabilities, resources, and ethics play a significant role in shaping and/or influencing the culture and behaviour of an organisation. The management structure and styles may impact positively, or negatively, the organisational culture. Organisational structures and management styles are also contributing factors to the behaviour of people, process, products, and partners.

Adopting service management practices and adapting them to suit the organisation will affect the culture and it is important to prepare people with effective communication plans, policies, procedures, education, training, coaching, and mentoring to achieve the desired new attitudes and behaviours.

While improving the quality of their services, organisations will eventually be confronted with their current organisational culture. The organisation will have to identify and address any changes to this culture as a consequence of the overall

improvement initiative. The organisational culture, or corporate culture, refers to the way in which people deal with each other in the organisation; the way in which decisions are made and implemented; and the attitude of employees to their work, customers, service providers, superiors, and colleagues.

Culture, which depends on the standards and values of the people in the organisation, cannot be controlled, but it can be influenced. Influencing the culture of an organisation requires leadership in the form of a clear and consistent policy, as well as a supportive personnel policy.

The corporate culture can have a major influence on the provision of IT services. Businesses value innovation in different ways. In a stable organisation, where the culture places little value on innovation, it will be difficult to adjust its IT services in line with changes in the organisation of the customer. If the IT department is unstable, then a culture which values change can pose a serious threat to the quality of its services. In that case, a “free for all” culture can develop where many uncontrolled changes lead to a large number of faults.

Processes, projects, programs and portfolios

Activities can be managed from a process perspective, from an organisational hierarchy (line) perspective, from a project perspective, or from any combination of these three. Organisations that utilise only one of these management systems seldom realise the greater potential synergies of leveraging any combination of the approaches. The practical choice often depends upon history, culture, available skills and competences, and personal preferences. The optimum choice may be entirely different, but the requirements for applying this optimum may be hard to realise and vary in time.

There are no “hard and fast laws” for the way an organisation should combine processes, projects, and programs. However, it is generally accepted that there are some consequences attached to modern practices in IT service organisations, since the most widely accepted approach to service management is based on process management. This means that whenever the organisation works with projects or programs, it should have established how these approaches work together.

The practical relationship between projects and processes is determined by the relative position of both in terms of “leading principles for the management of the organisation”: if projects are considered more important than processes, then decisions on projects will overrule decisions on processes; as a consequence, the organisation will not be able to implement a stable set of processes. If it is the other way around, with projects only able to run within the constraints of agreed processes, then project management will be a discipline that will have to adapt to new boundaries and definitions (e.g. since projects always change something from A to B, they will most likely fall under the regime of change, release and deployment Management).

The most suitable solution is dependent upon the understanding of the role of IT service management in the organisation. To be able to find a solution for this management challenge, it is recommended that a common understanding of processes, projects, programs, and even portfolios is created. The following definitions may be used:

Process – A process is a structured set of activities designed to accomplish a defined objective.

Project – A project is a temporary organisation, with people and other assets required to achieve an objective.

Program – A program consists of a number of projects and activities that are planned and managed together to achieve an overall set of related objectives.

Portfolio – A portfolio is a set of projects and/or programs, which are not necessarily related, brought together for the sake of control, coordination, and optimisation of the portfolio in its totality.

Note: In ITIL, a service portfolio is the complete set of services that are managed by a service provider.

There are also other portfolios such as the customer portfolio, the customer agreement portfolio, the application portfolio, etc.

Since the portfolio/program/project grouping is a hierarchical set of essential project resources, the issue can be downscaled to that of a relationship between a project and a process.

The most elementary difference between a process and a project is the one-off character of a project, versus the continuous character of the process. If a project has achieved its objectives, it means the end of the project. Processes can be run many times, both in parallel and in sequence. The nature of a process is aimed at its repeatable character: processes are defined only in case of a repeatable string of activities that are important enough to be standardised and optimised.

Projects are aimed at changing a situation A into a situation B. This can involve a simple string of activities, but it can also be a very complex series of activities. Other elements of importance for projects include money, time, quality, organisation, and information. Project structures are normally used only if at least one of these elements is of considerable value.

Actually, projects are just ways of organising a specific change in a situation. In that respect they have a resemblance with processes. It is often a matter of focus: processes focus at the specific sequence of activities, the decisions taken at certain milestone stages, and the quality of the activities involved. Processes are continuously instantiated and repeated, and use the same approach each time. Projects focus more

at the time and money constraints, in terms of resources spent on the change and the projects end, and projects vary much more than processes.

A very practical way of combining the benefits of both management systems might be as follows:

- Processes set the scene for how specific series of activities are performed.
- Projects can be used to transform situation A into situation B, and always refer to a change.
- If the resources (time, money, or other) involved in a specific process require the level of attention that is normally applied in a project, then (part of) the process activities can be performed as a project, but always under the control of the process: if changes are performed, using project management techniques, the agreed change management policies still apply.

This would allow organisations to maintain a continuous customer focus and apply a process approach to optimise this customer focus, and at the same time benefit from the high level of resource control that can be achieved when using project management techniques.

The service portfolio

The service portfolio is the complete set of services that is managed by a service provider. It provides information regarding the commitments and investments across all customers and market spaces. The service portfolio includes present contractual obligations, and description of services at the concept, development and improvement stages of the lifecycle. A link to third-party services may be included as they are often a key component part of the service offerings.

It is a three parts database or structured document.

Table 3.6 The three sections of the service portfolio

Service pipeline	All services that are under consideration or development, but are not yet available to customers. The service pipeline provides a business view of possible future services. The pipeline is not normally available to customers.
Service catalogue	All live IT services, including those available for deployment. It is the only part of the service portfolio published to customers, and is used to support the sale and delivery of IT services.
Retired services	All services that have been phased out or retired. Retired services are normally not available to new customers or for "ordering". Retired services are sometimes known as "legacy systems".

Service providers often find it useful to distinguish customer-facing services from supporting services:

Table 3.7 The two major types of services

Customer-facing services	The IT services which are visible to the customer. These services support the customer's business processes and facilitate one or more desired business outcomes. An analogy is to consider them "front-end" services.
Supporting services	IT services that support or 'underpin' the customer-facing services. These are typically not visible to the customer, but are essential to the delivery of customer-facing IT services. An analogy is to consider them "back-office" services.

Knowledge management

Quality data, information and knowledge enable people to perform process activities. It supports the flow of information between service lifecycle stages and processes. It is the responsibility of the knowledge management process in understanding, defining, establishing, and maintaining data and information.

A central repository for the data and information in the form of a tool is desirable. This tool is known as the service knowledge management system (SKMS). In reality, the SKMS is a federated model consisting of multiple tools and repositories using numerous platforms and file structures and formats. A four layers model is a popular approach to represent logically the SKMS. The bottom (first) layer represents the "raw" data from all platforms, file structures, and formats. The second layer represents the information which provides context to the raw data. The third layer represents knowledge in the form of different views which are then analysed for trends, and cause and effect, for example. The analysis determines the "why" of something. Finally the fourth layer represent the presentation layer in the form of different views for various audiences such as operational, tactical and strategic personnel.

3.3 Governance and management systems

Governance

Governance is the single overarching area that ties IT and the business together. Services are only one way of ensuring the organisation is able to execute and achieve governance. Governance is what defines the common directions, policies and rules that both the business and IT use to conduct business.

Governance ensures that policies and strategy are actually implemented, and that required processes are complied with. Governance includes defining roles and responsibilities, measuring and reporting, and taking actions to resolve any issues identified.

Governance works to apply a consistent, managed approach at all levels of the organisation. This starts by setting a clear strategy that defines the policies whereby the strategy will be achieved. The policies define boundaries: what is in or out of scope of organisational operations.

Management systems

A system is a number of related components that work together to achieve an overall objective. Systems should be self-regulating for agility and timeliness. In order to accomplish this, the relationships of all components within the system must influence one another for the sake of the whole. Key components of the system are the structure and processes that work together.

A service provider can deliver many benefits (see list below) by understanding the structure, the relationships between components and the effects of changes over time.

- Adaptability to the ever fluctuating needs of customers and markets
- Sustainable performance
- Defined approach to managing services, risks, costs, and value
- Effective and efficient service management
- Less conflict between processes and personnel
- Reduced duplication and bureaucracy

Management system (ISO 9001): the framework of policy, processes, functions, standards, guidelines, and tools that ensures an organisation or part of an organisation can achieve its objectives. An organisation may use multiple management system standards, such as:

Table 3.8 ISO Management systems aligned with ITSM

ISO 9001	Quality management system
ISO 14000	Environmental management system
ISO/IEC 20000	Service management system
ISO/IEC 27001	Information security management system
ISO/IEC 19770	Management system for software asset management
ISO/IEC 31000	Risk management
ISO/IEC 38500	Corporate governance of information technology

ISO/IEC 20000: ISO specification and code of practice for IT service management. ISO/IEC 20000 is aligned with ITIL best practices.

Specialisation and coordination across the lifecycle

A collaborative approach to service management is of utmost importance to an organisation.

An analogy that can be used to illustrate this is a high-performing sport team.

- Every player positions themselves to support the goal of the team
- Every office personnel positions themselves to support the goal of the team
- Each player and each office personnel has a different specialisation that contributes to the whole
- Every player and every office personnel work together toward the same goal of the team
- The team matures over time, taking into account feedback from experience, best practice, current process, and procedures to become an agile high-performing team

Specialisation and coordination are necessary aspects for a successful lifecycle approach. Specialisation combined with coordination helps to manage expertise, improve focus, and reduce overlaps and gaps in processes. Specialisation and coordination together help to create a collaborative and agile organisational architecture that optimises utilisation of assets.

Service management is most effective when people understand both the service lifecycle and the interactions between the various parties involved, the organisation, the customers, the users, and the suppliers.

Process integration across the service lifecycle depends on the understanding by the service owners, the process owners, the process managers, the process practitioners and other stakeholders of:

- The context of purpose, scope, limitations and use of each process
- The strategies, policies and standards influencing and governing the service management and the processes
- The levels of authority, accountability, and responsibility of those involved in each process
- The information flow between integrated processes, who produces what and why and how it will be used

3.4 Monitoring and control

Monitoring and control of services is based on a continuous cycle of monitoring, reporting, and initiating action. This cycle is crucial to providing, supporting, and improving services.

Introduction

Basic concepts

Three terms play a leading role in monitoring and control:

- Monitoring
- Reporting
- Control

Monitoring: refers to the observation of a situation to discover changes that occur over time.

Reporting: refers to the analysis, production, and distribution of the output of the activity that is being monitored.

Control: refers to the management of the usefulness or behaviour of a device, system, or service.

There are three conditions for control:

1. *The action must ensure that the behaviour conforms to a defined standard or norm*
2. *The conditions leading to the action must be defined, understood and confirmed*
3. *The action must be defined, approved, and suitable for these conditions*

The monitoring/control loop

The best-known model for the description of control is the monitoring/control loop. Although it is a simple model it has many complex applications in IT service management. In this section we describe the basic concepts of the model. Next we will show how important these concepts are for the service management lifecycle. Figure 3.2 reflects the basic principles of control.

This cycle measures an activity and its benefits by means of a pre-defined norm or standard to determine whether the results are within the target values for performance or quality. If this is not the case, action must be taken to improve the situation or resume the normal performance.

There are two types of monitoring/control loops:

- **Open loop systems** – are designed for a specific activity, irrespective of the environmental conditions; making a backup, for instance, can be initiated at a specified moment and be completed regardless of other conditions.
- **Closed loop systems** – Monitoring of an environment and responding to changes in this environment; if, in a network, the network transactions exceed a certain number, the control system will redirect the “traffic” via a backup circuit in order to regulate the network transactions.

Figure 3.3 shows a sample **complex monitoring/control loop**: a process that consists of three important activities. Each activity has an input and output and in turn this output is the input for the next activity. Every activity is controlled by its own monitoring/control loop with the aid of a series of norms for that specific activity.

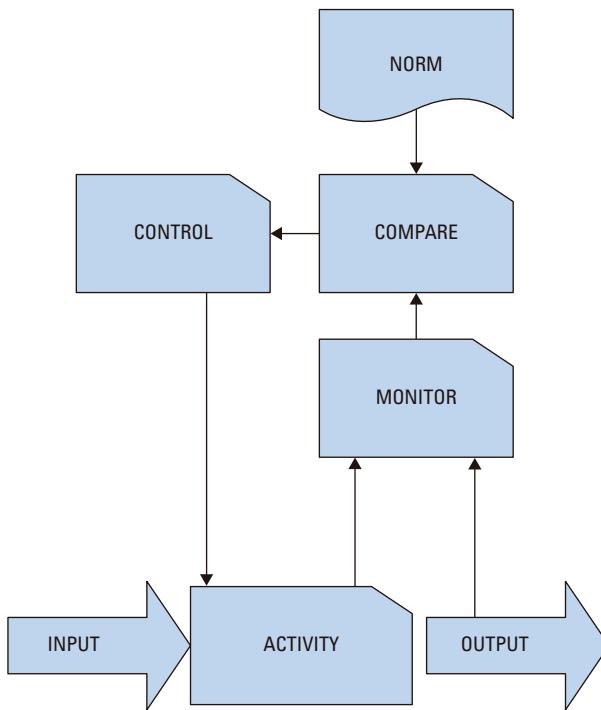


Figure 3.2 Sample monitor/control loop

Source: The Cabinet Office

A coordinating monitoring/control loop monitors the entire process and ensures that all norms are suitable and are being complied with.

The monitoring/control loop concept can be used to manage:

- The performance of activities in a process or procedure
- The effectiveness of the process or procedure as a whole
- The performance of a device or a series of devices

Answer the following questions to determine how the concept of monitoring/control loops can be used in service management:

- How do we define what we need to monitor?
- How do we monitor (manually or automated)?
- What is a normal process?
- What do we depend on for a normal process?
- What happens before we receive the input?
- How often do we need to measure?

Figure 3.4 shows a sample **IT service management monitoring/control loop** and shows how the control of a process or the components of that process can be used to provide a service.

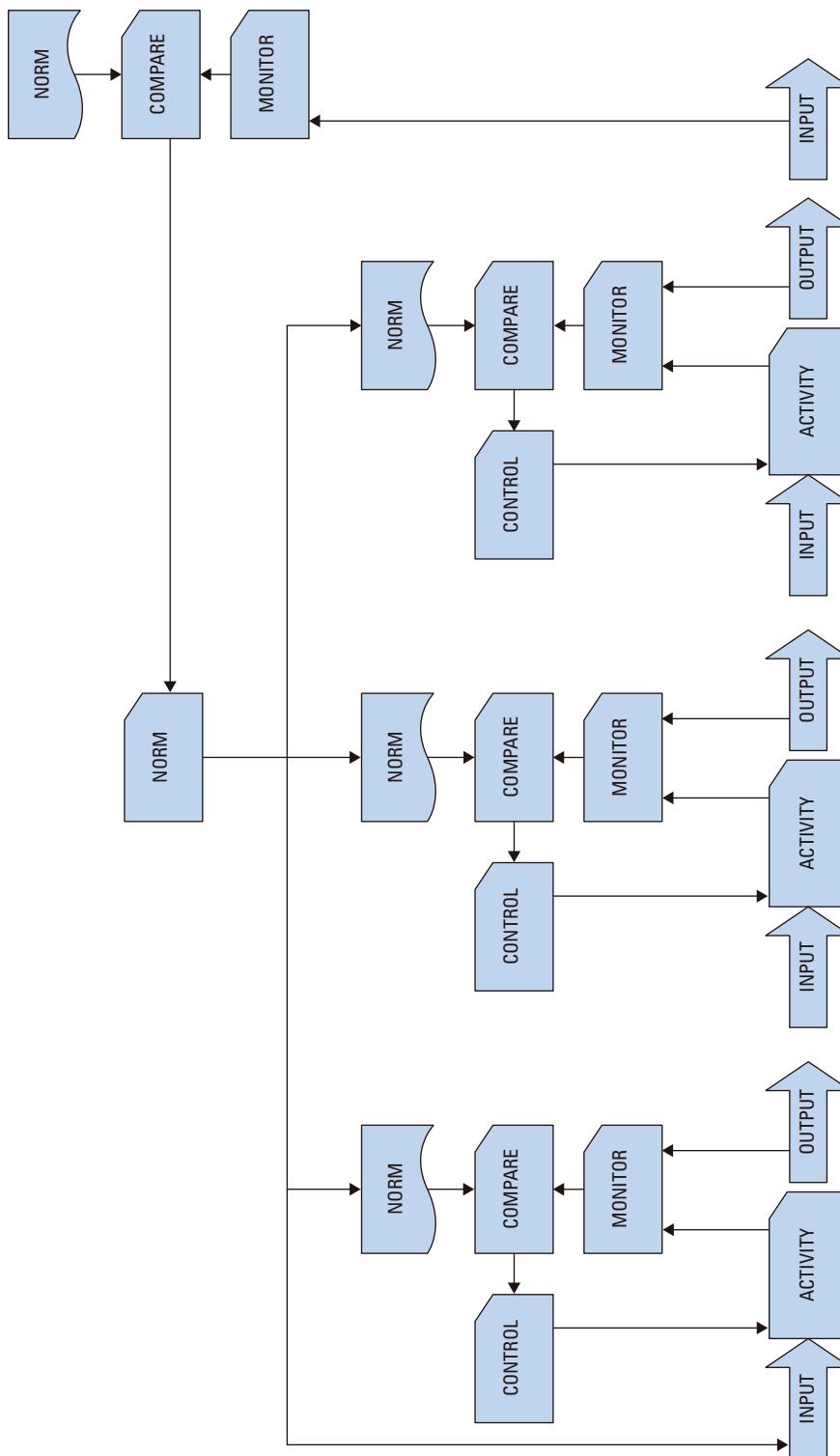


Figure 3.3 Sample complex monitor/control loop
Source: The Cabinet Office

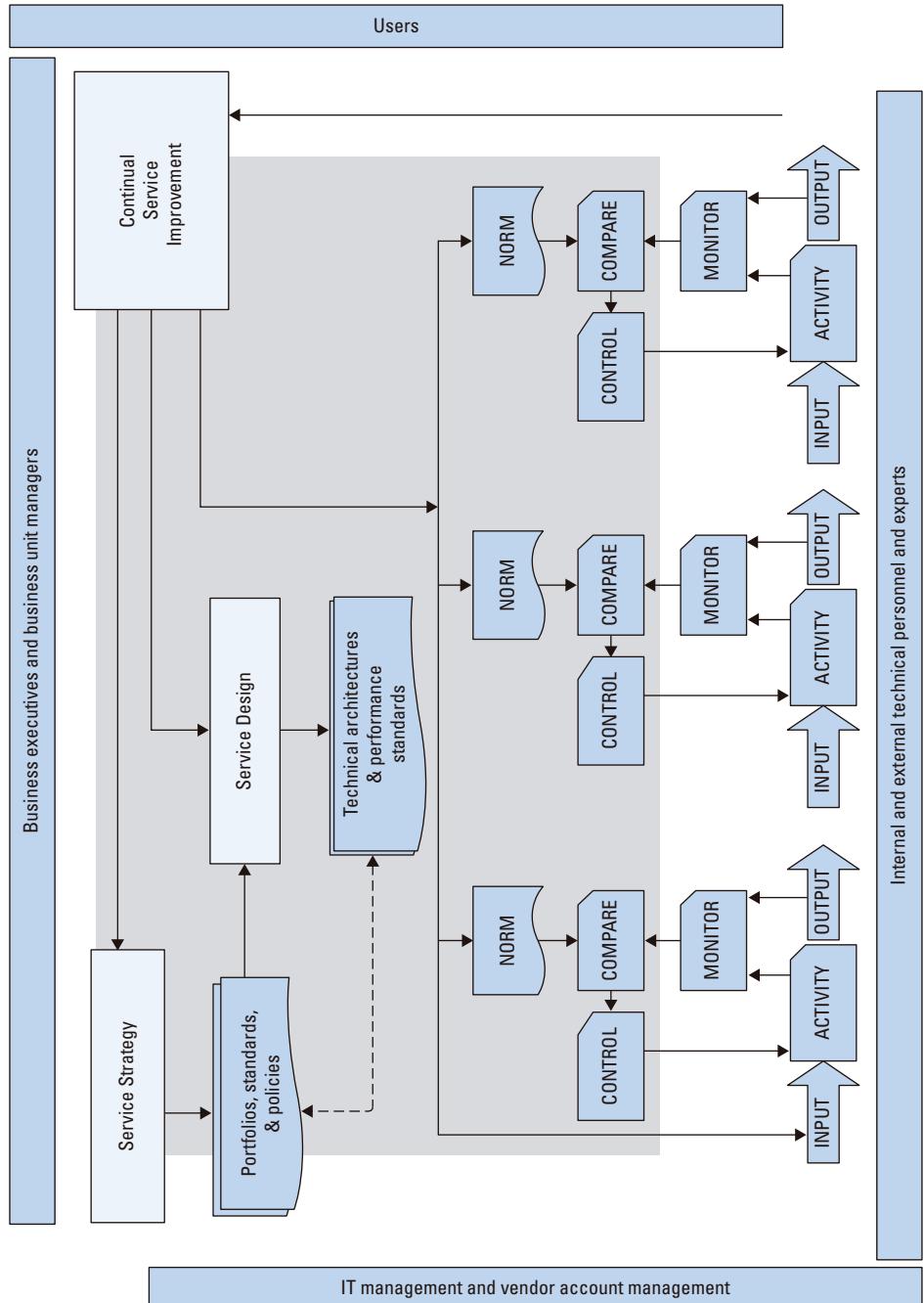


Figure 3.4 Sample ITSM monitor/control loop
Source: The Cabinet Office

There are two levels of monitoring:

- **Internal monitoring and control** – focuses on activities and items that take place within a team or department, for instance a service desk manager who monitors the number of calls to determine how many members of personnel are needed to answer the telephones
- **External monitoring and control** – the server management team monitors (on behalf of other groups) the CPU performance on important servers and keeps the workload under control; this allows essential applications to perform within the target values set by the application management

This distinction is important. If Service Operation focuses only on internal monitoring the infrastructure is well organised, but the organisation has no idea what the quality of the services is or how they can improve this quality. If the organisation focuses only on external monitoring it understands how bad the quality of the service is, but it does not know what causes this or how it can change this. In practice, most organisations use a combination of internal and external monitoring, but in many cases they are not linked.

Monitoring without control is irrelevant and ineffective. Monitoring must always be aimed at achieving the service and operational objectives. If, therefore, there is no clear reason for the monitoring of a system or service, there should be no monitoring.

In order for an organisation to determine what it wants to monitor, therefore, it must first define the desired outcome: **monitoring and control objectives**. Ideally this process should start with the definition of *Service Level Requirements*. These will specify how the customers and users measure the quality of the service. In addition, these Service Level Requirements provide the input for the Service Design processes. Availability management, for instance, will determine how the infrastructure must be configured to achieve the fewest possible disruptions.

An important part in determining what Service Operation will be monitoring and how it will get the processes under control is identifying the stakeholders of each service. A stakeholder can be defined as being anyone who has an interest in IT services being successfully supplied and received. Each stakeholder will consider, from their own perspective, what is necessary to provide or receive an IT service. Service Operation must know what these perspectives are in order to determine what needs to be monitored and what needs to be done with the output.

Tools

There are different types of monitoring tools, whereby the situation determines which **type of monitoring** is used:

- **Active versus passive monitoring:**
 - *Active monitoring* refers to the continual “interrogation” of a device or system in order to determine its status.

- *Passive monitoring* is more commonly known and refers to generating and passing on events to a device or monitoring agent.
- **Reactive versus proactive monitoring:**
 - *Reactive monitoring* is designed to request an action after a certain type of event or disruption.
 - *Proactive monitoring* is used to trace patterns of events that indicate that a system or device may break down. Proactive monitoring is generally used in more mature environments, where these patterns can be detected earlier.
- **Continuous measuring versus exception-based measuring:**
 - *Continuous measuring* is aimed at the real-time monitoring of a system to ensure that it complies with a certain performance norm.
 - *Exception-based* measuring does not measure the current performance of a service or system, but discovers and reports exceptions. An example is the generation of an event if a transaction is not completed. It is used for less essential systems or for systems where costs are important.
- **Performance versus output** – There is an important distinction between reporting on the performance of components, or personnel versus reporting on the *output* – service quality objectives – that have been achieved.

Metrics

It is important that organisations have robust measuring techniques and values that support their objectives. In this context, the following concepts are relevant:

- **Measuring** – Refers to all techniques that evaluate the scope, dimension, or capacity of an item in relation to a standard or unit. Measuring is only useful when it is possible to measure the actual output of a system, function, or process against a standard or desired level. For instance, a server must be capable of processing a minimum of 100 standard transactions per minute.
- **Metrics** – Concern the quantitative, periodic evaluation of a process, system, or function, together with the procedures and tools that are used for this evaluation, and the procedures for interpreting them. This definition is important because it not only specifies what must be measured, but also how the measuring must be done, what the acceptable lower and upper performance limits are and what actions are necessary in the case of normal performance or an exception.
- **Key Performance Indicators (KPIs)** – Refer to a specific, agreed performance level to measure the effectiveness of an organisation or process. KPIs are unique to each organisation and are related to specific input, output, and activities.