The Vrije Universiteit IT Service Capability Maturity Model[1]

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Contents

Chapter 1

Introduction

This document describes the Vrije Universiteit Information Technology Service Capability Maturity Model, or IT Service CMM for short. The IT Service CMM is a capability maturity model that specifies different maturity levels for organizations that provide IT services. Examples of IT services are the maintenance of software systems, operation of information systems, the management and maintenance of workstations, networks or mainframes, or the provision of contingency services. An important question is how these services should be defined and managed. The complexity of IT applications makes it difficult to properly tune customer requirements and service provider capabilities. Customers often cannot express their real service requirements and do not know the corresponding performance needs. Likewise, service providers often do not know how to differentiate between IT services and how to attune them to a specific customer. The IT Service CMM is aimed at enabling IT service providers to assess their capabilities with respect to the delivery of IT services and to provide IT service providers with directions and steps for further improvement of their service capability.

1.1 Origin of the IT Service CMM

The IT Service CMM described in this document originates from two multi-partner research projects, partly supported by the Dutch Ministry of Economic Affairs. Partners in these projects – 'Concrete Kit' and 'Kwintes' – were Cap Gemini, Twijnstra Gudde, the Tax and Customs Computer and Software Centre of the Dutch Tax and Customs Administration, the Technical Universities of Delft and Eindhoven, and the Vrije Universiteit Amsterdam. These projects were aimed at developing a method to specify and control IT services. The process model used to describe the dynamics of IT service management is depicted in figure 1.1 [15]. The left part of the lemniscate concerns the specification of IT services (upper arrow) and the evaluation and monitoring of the performance of the service provider (lower arrow). The right part concerns the evaluation and monitoring of service processes (upper arrow) and the design and organization of those processes. The mutual commitments between service provider and customer, laid down in a service level agreement (SLA), play a pivotal role in this scheme.

The IT Service CMM captures the activities represented by the four arrows in figure 1.1 in five maturity levels and different key process areas. Level two of the IT Service CMM is aimed at describing what practices organizations need to implement to be able to consistently traverse the above described IT service lemniscate. These practices include the management of commitments, the tracking of service delivery, configuration management, the planning of service delivery, etc.

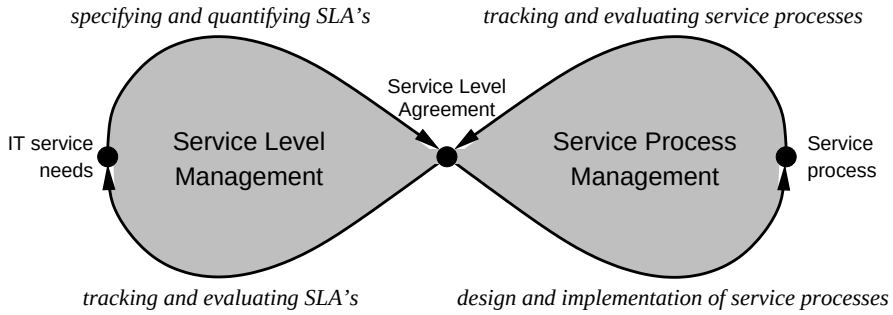

Figure 1.1: IT Service Lemniscate

1.2 Structure of this document

Part I gives an overview of the model, its structure, the concepts used, and the design decisions made. Part II specifies the key process areas in terms of their goals and common features. Note that so far only level two of the IT Service CMM has been specified completely. The specification of the key practices of level three and higher levels remain to be done. Part III contains two appendices that describe the change history of this document and the differences and similarities between the IT Service CMM and the IT Infrastructure Library (ITIL).

1.3 Other publications

Earlier reports on the IT Service CMM and related subjects have been published in [2, 9, 10, 11]. The results of the research projects Concrete Kit and Kwintes are summarized in two books (in Dutch) [12, 16]. In the near future, a web site should be available at `http://www.kwintes.nl`. An electronic copy of this document is available via
`http://www.cs.vu.nl/~frankn/publications.html`.

Part I

The IT Service CMM: Background, Concepts, Structure, and Usage

Chapter 2

The IT Service Capability Maturity Model

In this chapter we describe the IT Service Capability Maturity Model. First, in section 2.1 the structure of the IT Service CMM is presented. Section 2.2 presents the major characteristics of the model. Next, in section 2.3 the objectives of the IT Service CMM are laid out. Section 2.4 presents the maturity levels of the model. Finally, section 2.5 describes the most important design decisions made during the development of the IT Service CMM.

2.1 The structure of the IT Service CMM

The IT Service CMM is based on the Software CMM (see section 2.5.2 for the motivation of this choice). Where applicable, the descriptions of the IT Service CMM maturity levels and key process areas are adjusted from [13]. The structure of the Software CMM and the IT Service CMM are largely the same, see figure 2.1. The model consists of five maturity levels, which contain key process areas. For an organization to reside on a certain maturity level, it needs to implement all of the key processes for that level, and those of lower levels.

Each key process area is structured using common features. Common features are practices that, when performed together, guarantee that the key process area is implemented and institutionalized. Common features consist of key practices that describe activities that have to be performed or infrastructures that have to be present.

2.2 Characteristics of the IT Service CMM

There are a number of characteristics of the IT Service CMM that are important for understanding its nature. The main *focus* of the model is the complete service organization, the *scope* of the model encompasses all service delivery activities, i.e. those activities which are key to improving the service delivery capability of service organizations, the model is *strictly ordered*, and the model is a *minimal* model in different senses.

Focus The main focus of the model is on the maturity of the service organization. The model does not measure the maturity of individual services, projects or organizational units, but only that of the whole service organization.

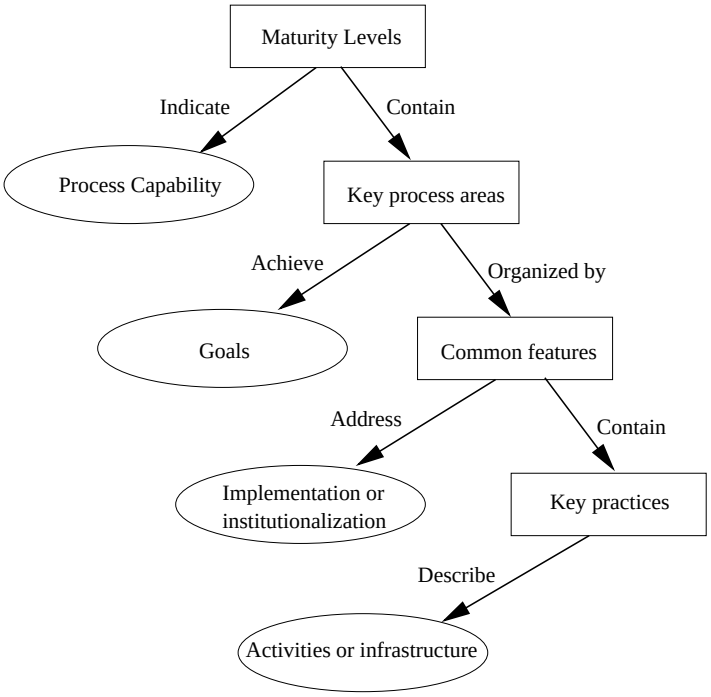

Figure 2.1: The CMM structure (taken from [13])

Scope The model covers the service delivery process. The service delivery process covers all activities involved in creating the result for the customer, starting from identifying the needs of the customer until evaluating the delivered services. It does not cover the development of new services.

Strictly ordered The key process areas are assigned to different maturity levels in such a way that lower level processes provide a foundation for the higher level processes. Therefore, an organization has to implement all key processes of level n, $n-1$, etc., to reside on level n. This rather strict requirement is feasible because the model is also a minimal model, see below.

Note that the model does not prohibit the implementation of key processes from level $n+1$, $n+2$, etc., before reaching level n, but in general it will be difficult to fully implement key processes from higher maturity levels. Higher level key process areas often build upon activities and infrastructure implemented by lower level key process areas. For example, they key process area Problem Prevention builds upon the quantitative data that is only fully available when Quantitative Process Management has been implemented.

Minimal The IT Service CMM is a minimal model in different ways:

- The model only specifies processes needed to reach a certain level of maturity, hence the term *key* processes. The quality of other processes that an organization might use – such as financial administration and human resource management – is not deemed essential to the IT service process maturity of the organization. Therefore, these processes are not part of this maturity model.
- The model only prescribes what processes and activities are needed to reach a certain

maturity level. The model does not tell you how to implement them, what organization structure to use, etc. For example, one of the activities of the key process area Service Delivery Planning states that 'The service plan is developed according to a documented procedure'. How exactly that documented procedure looks is not dictated by the IT Service CMM. One way to implement the processes would be to use best practices, such as the best practices for IT management described in the *IT Infrastructure Library* [3].

2.3 Primary objectives of the IT Service CMM

The objective of the IT Service CMM is twofold:

1. to enable IT service providers to assess their capabilities with respect to the delivery of IT services, and,

2. to provide IT service providers with directions and steps for further improvement of their service capability.

The IT Service CMM fulfills these goals by measuring the capability of the IT service processes of organizations on a five level ordinal scale. Each level prescribes certain key processes that have to be in place before an organization resides on that level. Key processes implement a set of related activities that, when performed collectively, achieve a set of goals considered important for enhancing service process capability. Hence, organizations can improve their service capability by implementing these key processes.

More formally, we define *IT service process capability* as the range of expected results that can be achieved by following a service process. *IT service process performance* represents the actual results achieved by following an IT service process. *IT service process maturity* is the extent to which a specific process is explicitly defined, managed, measured, controlled and effective. The IT Service CMM focuses on measuring and improving the IT service process maturity of IT service organizations.

An organization that scores high on the IT Service CMM scale will be able to:

- deliver quality IT services, tailored to the need of its customers;

- do so in a predictable, cost-effective way;

- combine and integrate different services, possibly delivered by different service providers, into a consistent service package;

- continually and sustainably improve service quality in a customer-focused way.

2.4 The maturity levels of the IT Service CMM

We measure the service process maturity of organizations on a five level ordinal scale. The first – initial – level has no associated key process areas. This is the level where all IT service organizations reside that have not implemented the level two key process areas. Level two is the repeatable level. Organizations that have reached level two will be able to repeat earlier successes in similar circumstances. Thus the emphasis of level two is on getting the IT services right for one customer. On level three, the defined level, the service organization has defined its processes and is using tailored versions

of these standard processes to deliver the services. By using common organization-wide standard processes, the process capability to deliver services consistently is improved. At level four, the managed level, organizations gain quantitative insight into their service processes and service quality. By using measurements and an organization-wide measurement database organizations are able to set and achieve quantitative quality goals. Finally, at level five, the optimizing level, the entire organization is focused on continuous process and service improvement. Using the quantitative measurements the organization prevents problems from recurring by changing the processes. The organization is able to introduce new technologies and services into the organization in an orderly manner.

More formally, we define the five maturity levels as follows:

1. *Initial level*: The IT service delivery process is characterized as ad hoc, and occasionally even chaotic. Few processes are defined, and success depends on individual effort and heroics.

2. *Repeatable level*: Basic service management processes are established. The necessary discipline is in place to repeat earlier successes on similar services with similar service levels.

3. *Defined level*: The IT service processes are documented, standardized, and integrated into standard service processes. All services are delivered using approved, tailored versions of the organization's standard service processes.

4. *Managed level*: Detailed measurements of the IT service delivery process and service quality are collected. Both the service processes and the delivered services are quantitatively understood and controlled.

5. *Optimizing level*: Continuous process improvement is enabled by quantitative feedback from the processes and from piloting innovative ideas and technologies.

2.5 Design choices

During the development of the IT Service CMM a number of design choices have been made. In this section we discuss the two major decisions made and the motivation for these decisions. First, the focus on service capability is discussed in section 2.5.1. Second, the choice for an improvement and assessment based capability maturity model is discussed in section 2.5.2.

2.5.1 Scope: a Service Capability Model

A major difference between software and hardware development on the one hand, and software maintenance, system operation, network management, etc., on the other hand, is the fact that the first result in a *product*, whereas the latter result in a *service* being delivered to the customer. Usually, a service is defined as an essentially intangible set of benefits or activities that are sold by one party to another. The main differences between products and services are:

a) Services are transitory by nature, products are not. Hence, services can not be easily held in stock.

b) Product delivery results in a transfer of ownership, service delivery does not.

c) The use of products can be separated from the production of products. Services are produced and consumed simultaneously.

d) Services are largely intangible, whereas products are largely tangible.[1]

The difference between products and services is not clear-cut. Often, services are augmented with physical products to make them more tangible, for example, luggage tags provided with a travel insurance. In the same way, products are augmented with add-on services, for example a guarantee, to improve the quality perception of the buyer. Moreover, customers might even consider the quality of service more important than the characteristics of the product itself, e.g. [14].

Often, products and services are intertwined. An example is a newspaper subscription, in which case both the product – the newspaper itself – and the service – the daily delivery – are essential to the customer. This means that the quality of such a product-service mix will be judged on both product and service aspects: is the newspaper delivered on time, and does it contain the desired information.

Like the newspaper, IT management and maintenance can very well be a mixture of product and service. For example, in a situation where a software maintainer analyzes change requests for a fixed price per period and implements change requests for a price per change request, software maintenance is a product-service mixture. Here, the *service* is the customer having the possibility to have change requests analyzed, and the *product* is the implemented change.

Looking at IT management and maintenance activities from a service perspective, a number of issues that pertain to the quality of these activities emerge:

- If the activities are performed in an ongoing relationship with the customer, which they will almost always be, the service provider needs to facilitate communication between end-users and its organization. Moreover, this communication needs to be managed and controlled.
- The customer and the service provider have to agree on the quality levels with which the service will be delivered. Examples are: the maximum number of change requests that will be implemented per period, the availability of IT systems and networks, etc.
- The service provider and customer need to evaluate the service on a regular basis: is the service still what the customer needs?
- Possibly, the service provider has to cooperate with third parties to perform its job. For example, new software may be developed by a software house, and is subsequently maintained by the service provider. Or the software may be operated by a separate computer center and maintained by the service provider.

Although each of the above points plays a role in software and hardware development too, the conjecture is that these activities are more important as service aspects are more prevalent. Regardless of the exact circumstances in which an IT service organization operates, sufficient emphasis should be on processes like the ones mentioned above, to be able to deliver quality IT services. See [9, 11] for a more elaborate discussion of these issues.

2.5.2 Form: a Capability Maturity Model

There are a two reasons why it was decided to use the capability maturity framework developed at the SEI as a basis for our service improvement model. First, the Software CMM is a widely used and well-known software process improvement model. We felt that its structure is generic enough to facilitate other areas besides software processes. This has already been shown by the development

[1] Software obviously is not tangible, but it is still a product because of its other characteristics (a, b, and c).

of other capability maturity models, such as the People CMM [5, 6] and the System Engineering CMM [1].

Second, we wanted to provide organizations with a mechanism with which they can perform stepwise improvement. Improvement should be an integral part of the framework. This is the case with the CMM where the framework functions as a prescriptive model and assessments are used to compare the actual situation with the model.

The granularity of the improvement steps of the CMM is rather coarse – an organization resides on one of five different levels. Other software process improvement models, such as SPICE/ISO 15504 [7], Bootstrap [8], or Trillium [17], use a more detailed architecture. Bootstrap, for example, distinguishes between the maturity of the organization and the maturity of projects. The SPICE model, Trillium and Bootstrap rate the maturity of organizations with respect to different processes: this makes it possible that an organization rates level three for one process and level four for another process, for example. However, we decided to use the simpler approach of the CMM for practical reasons: we wanted to construct a fairly complete framework with limited resources, within limited time.

Chapter 3

Interpreting the IT Service CMM

In this chapter, we discuss the concepts used in the specification of the IT Service CMM and how to interpret them. Definitions of concepts that originate from the Software CMM, such as most of the CMM-specific terminology, are taken from [13].

3.1 Interpreting the Key Practices

The key practices are not intended to require a specific implementation or organizational structure. They are intended to cover the activities that an organization needs to implement to reach a certain level of maturity. How the organization implements them is not important, as long as they are performed. Therefore the IT Service CMM only specifies *what* practices are needed, not *how* they need to be implemented.

3.2 Interpreting the Common Features

Each key process area is defined in terms of its goals and its common features. Common features are the activities that an organization needs to perform to properly implement a key process area. The common features are divided into five categories [13]:

Commitment to Perform The key practices in the Commitment to Perform common feature describe the actions the organization must take to ensure that the process is established and will endure. They typically involve establishing organizational policies and leadership.

Ability to Perform The key practices in the Ability to Perform common feature describe the preconditions in the services or organization necessary to implement the service process competently. They typically involve resources, organizational structures, and training.

Activities Performed The key practices in the Activities Performed common feature describe the activities, roles, and procedures necessary to implement a key process area. They typically involve establishing plans and procedures, performing the work, tracking it, and taking corrective actions as necessary.

Measurement and Analysis The key practices in the Measurement and Analysis common feature describe basic measurement practices that are necessary to determine status related to the process. Measurements included in this common feature are used to control and improve the process.

Verifying Implementation The key practices in the Verifying Implementation common feature describe the steps to ensure that the activities are performed in compliance with the process that has been established. They generally include key practices that relate to oversight by senior management and project management, as well as specific verification activities that the service quality assurance group or others are expected to perform to verify that the process is being performed properly.

3.3 Service Activities

Service activities are all activities that directly or indirectly contribute to creating the service result for the customer. Service delivery activities directly produce service results for the customer. Examples are the restart of a crashed system, backing up user data, installing a new version of an information system, creating an account for a new user, answering questions about the use of software, replacing a broken piece of hardware, etc. Hence, service delivery activities are a subset of the service activities. Examples of service activities that indirectly contribute to the service results are recording incidents, planning the service delivery, setting up a configuration baseline, etc.

The IT Service CMM key process areas mostly contain the latter category of service activities. The service delivery activities will differ between different services, so the specification of these activities is left to the service organization itself.

3.4 Organizational Structure and Roles

As mentioned in section 3.1 the IT Service CMM attempts to describe what activities are needed for high maturity IT service delivery, and not how these activities should be implemented. However, in order to describe the activities, some roles are needed. These are described below.

3.4.1 Organizational Roles

A role is a unit of defined responsibilities that may be assumed by one or more individuals [13]. The following roles are used in the description of the key practices:

Manager A manager provides technical and administrative direction and control to individuals performing tasks or activities within the manager's area of responsibility.

Senior manager A senior manager fulfills a management role at a high enough level such that the primary focus is on the long-term vitality of the organization, rather than on short-term issues.

Service manager A service manager has total business responsibility for a service, its characteristics, and performance.

Service delivery manager A service delivery manager is responsible for the delivery of one or more services to a specific customer.

First-line manager A first-line manager fulfills the role of manager for a single organizational unit.

Service task leader A service task leader fulfills the role of leader of a technical team and has technical responsibilities.

Service engineers Service engineers are the technical people, including service task leaders, who perform the service delivery activities needed to deliver the service.

3.4.2 Organizational Structure

Two organizational concepts are used:

Organization An organization is a unit, possibly within a company or other entity, by which services are delivered as a whole.

Group A group is a collection of departments and individuals who have responsibility for a set of tasks or activities. Examples of groups are the service delivery group, the service quality assurance group, and the configuration management group.

Chapter 4

The key process areas of the IT Service CMM

As stated in section 2.3, for an organization to reside on a certain maturity level, it needs to implement all key processes for that maturity level – and those for lower levels. The term *key* process area merely means that these processes are seen as the key to reach a certain maturity level. There might be more – non-key – processes, but these are not strictly necessary to reach the next maturity level.

Process categories **Levels**	**Management** Service planning, management, etc.	**Enabling** Support and standardization.	**Delivery** Actual service delivery.
Optimizing	Process Change Management	Technology Change Management	Problem Prevention
Managed	Quantitative Process Management		Service Quality Management
Defined	Integrated Service Management	Organization Process Focus Organization Process Definition Training Program	Service Delivery
Repeatable	Service Commitment Management Service Delivery Planning Service Tracking and Oversight Subcontract Management	Configuration Management Event Management Service Quality Assurance	
Initial	Ad hoc processes		

Table 4.1: Key process areas, assigned to process categories

Table 4.1 gives an overview of the key process areas. The key process areas are grouped into

three process categories: management, enabling and delivery. The first group is concerned with the management of services. The second category deals with enabling the delivery process by means of support processes and standardization of processes. The third category consists of the processes that result in the consistent, efficient delivery of services according to the appropriate quality levels. Below we present the key process areas for each of the maturity levels of the IT Service CMM.[1]

4.1 Level 1: Initial

There are no key process areas prescribed for level one.

4.2 Level 2: Repeatable

The key process areas for level two are concerned with establishing the processes that enable the organization to repeat earlier successful services in similar situations. We distinguish between two kinds of processes that an organization has to implement on this level. The first category deals with service management: the planning, specification, tracking and evaluation of services. The second category is concerned with service support: processes that support the activities that actually deliver the services.

The management processes on this level look as follows. First, the service provider and the customer draw up an agreement about the services to be delivered, the quality of the services – specified in terms of service levels – and the costs of the services (Service Commitment Management). To ensure that the service levels are realistic, the service provider draws up a service plan that shows the feasibility of the service levels (Service Delivery Planning). During service delivery, the service provider tracks the realized service levels and reports these to the customer on a regular basis to demonstrate that the provider has indeed delivered the services against the promised service levels (Service Tracking and Oversight). After a period of service provision, the customer and the service provider review the service level agreement to see whether it still conforms to the IT needs of the customer (Service Commitment Management). Just like the organization draws up a service level agreement with its customer, the organization should also use service level agreements when it delegates parts of the service delivery to third parties (Subcontract Management).

We identify three support processes that a level two organization needs to implement. First, almost all IT services concern the management, operation or maintenance of hardware and software components. Therefore, where necessary for consistent service delivery, these components are put under configuration control. This ensures that at all times the status and history of these components is known, and that changes are controlled (Configuration Management). Second, during the period that the services are delivered, events can occur that need to be resolved by the service provider. These events range from simple requests for service to serious incidents that prevent the customer from using its information technology. All these events need to be identified, tracked, resolved and reported to the customer (Event Management). To service the request and to resolve incidents, changes to the configuration may be necessary. The change requests are evaluated by the configuration control board[2] with respect to the service level agreement and risk for the integrity of the configuration. Only after a change request has been approved by the configuration control board, will the configuration be changed (Configuration Management). Finally, to ensure the quality of the services, the service

[1] Note that because the model is still under development, the key process areas for level four and five have been specified in less detail than the level two and three key process areas.

[2] Note that this is a role, and not an actual organizational unit.

provider deploys quality assurance techniques, such as reviews and audits (Service Quality Assurance).

Next follows a description of the level two key process areas:

1. Service Commitment Management:
   Purpose: Services are specified and realistic service levels are negotiated with the customer in order to deliver services that satisfy the customer's need for IT services. The delivered services, the specified service levels and the customer's service needs are reviewed with the customer on a regular basis. When necessary, the service level agreement is adjusted.

   There are two basic issues targeted by this key process area: first, the service to be delivered is specified in a contract – the service level agreement – containing *measurable* service levels. Second, the service levels specified should address the business needs of the customer.

2. Service Delivery Planning:
   Purpose: The service delivery is planned in order to ensure that the specified services can indeed be delivered according to the agreed upon service levels. The service delivery planning forms the basis for delivering the services.

3. Service Tracking and Oversight:
   Purpose: Service delivery is being tracked. The realized service levels are compared with the specified service levels and are reported to the customer and management on a regular basis. Corrective actions are taken when actual service delivery deviates from the specified service levels.

   The service provider reports to the customer the actual services delivered, the actual service levels, and, when relevant, calamities that hindered accurate service delivery. The service level reports are used as input for the evaluation of service level agreements (see Service Commitment Management).

4. Subcontract Management:
   Purpose: Select qualified IT subcontractors and manage them effectively.

   The service provider can select and hire subcontractors to delegate parts of the service. If this is the case, the service to be delivered by the subcontractors is laid down in a service level agreement. The service provider keeps track of the actual services delivered by the subcontractor and takes corrective actions when the actual service levels deviate from the specified service levels.

5. Configuration Management:
   Purpose: The integrity of products which are subject to or part of the IT services is established and maintained.

   Configuration Management involves the identification of the relevant hardware and software components which need to be put under configuration control. This includes components owned by the customer that are being managed by the service provider, components owned by the provider that are used by the customer and components owned by the provider that are used to deliver the service. Changes to the configuration are evaluated with respect to the service level agreement and with respect to possible risks for the integrity of the configuration.

6. Event Management:
   Purpose: Events regarding the service are identified, registered, tracked, analyzed, and resolved. The status of events is communicated with the customer and reported to management.

This key process area concerns the management of events that causes or might cause service delivery to deviate from the agreed upon service levels. Events can be either:

- Requests for service from users. For example, requests for a new feature in the software;
- Incidents that cause or will cause service levels to be lower than agreed upon if no action is being taken. For example, a server that is down might cause the specified maximum down-time to be exceeded if it is not restarted quick enough.

To resolve requests for service and incidents, changes to the configuration might be necessary. The decision whether to implement the change request that results from a service request or incident is the concern of Configuration Management.

7. Service Quality Assurance:
   Purpose: Management is provided with the appropriate visibility into the processes being used and the services being delivered.

   Service Quality Assurance involves the reviewing and auditing of working procedures, service delivery activities and work products to see that they comply with applicable standards and procedures. Management and relevant groups are provided with the results of the reviews and audits. Note that where Service Tracking and Oversight is concerned with measuring service quality in retrospect, from an external point of view, Service Quality Assurance is concerned with measuring quality in advance, from an internal point of view.

4.3 Level 3: Defined

At level three, an organization standardizes its processes and uses tailored versions of these standard processes to deliver the IT services. This results in more predictable performance of the processes and hence it increases the ability of the organization to draw up realistic service level agreements. The level three key process areas each fall into one of the three process categories: management, enabling or delivery.

The first category – service management – is concerned with the tailoring of the standard service processes to the customer and the service level agreement at hand. Also, the actual service processes need to be integrated with each other and with third party service processes (Integrated Service Management). The second category – enabling – deals with making standard processes available and usable. The organization develops and maintains standard processes for each of the services it delivers. Usually, organizations will provide several services to one customer at the same time. Hence, not only the service processes themselves, but also the integration of these processes has to be standardized as much as is feasible (Organization Process Definition). To coordinate process efforts across services and organizational units and over time, organizational support is institutionalized (Organization Process Focus). Also, to teach people how to perform their roles and how to work with the standards, a training program needs to be put in place (Training Program). The third category – service delivery – concerns the actual delivery of the services to the customer using the tailored service processes (Service Delivery).

The level three key process areas are described as follows:

1. Organization Process Definition:
   Purpose: Develop and maintain a usable set of service process assets that improve process

performance across services, and provide a basis for cumulative, long-term benefits to the organization.

This key process area involves the creation and maintenance of standard service processes, and a process database which contains historic data on used processes, including the service level agreements, the service planning, the service level reports and the event management database. Based on historic service processes a service catalog is developed and maintained which contains the services and service levels that the organization provides.

2. Organization Process Focus:
   Purpose: Establish organizational responsibility for service process activities that improve the organization's overall service process capability.

   The activities needed to assess, develop, maintain and improve the organization's service processes are resourced and coordinated across current and future services.

3. Training Program:
   Purpose: Develop the skills and knowledge of individuals so they can perform their roles effectively and efficiently.

4. Integrated Service Management:
   Purpose: Integrate the IT service and management activities into a coherent, defined IT service process that is derived from the organization's standard service process.

   The service planning is based on this tailored service process and describes how its activities will be implemented and managed. The service planning takes the organization-wide capacity and availability of resources into account. Cooperation with third parties that also deliver IT services or products to the customer, is planned. Note that these third parties can be external providers or organizational units of the customer itself. An example of this could be the customer having its own helpdesk which relays reports of hardware failures to the service provider. Procedures need to be put in place on how these reports will be delivered to the service provider and whether the helpdesk or the service provider will inform the user of the status of the report. An example which involves coordination with third parties that deliver products to the customer, is software development. Suppose a third party is developing software for the customer that is to be managed and maintained by the service provider. Involvement of the service provider in the development process can ensure that maintenance and management of the software is sufficiently being taken into account during development.

5. Service Delivery:
   Purpose: Consistently perform a well-defined service delivery process that integrates all service delivery activities to deliver correct, consistent IT services effectively and efficiently.

   Service Delivery involves the performing of service delivery activities using a tailored version of the services' defined service processes (which is the output of the Integrated Service Management key process area). Because the service activities depend on the particular services being provided, there is no fixed list of activities to be performed. However, all services should perform the activities as defined in the level two key process areas. The list of activities will be filled in depending on the services at hand. For example, in the case of software maintenance the general service activities will be extended with the software engineering tasks mentioned in the key process area Software Product Engineering of the Software CMM [13, pp. 241–261].

4.4 Level 4: Managed

At level four, organizations gain a quantitative understanding of their standard processes by taking detailed measures of service performance and service quality (Quantitative Process Management) and by using these quantitative data to control the quality of the delivered services (Service Quality Management).

There are two level four key process areas:

1. Quantitative Process Management:
   Purpose: Control the process performance and costs of the service delivery quantitatively.

2. Service Quality Management:
   Purpose: Develop a quantitative understanding of the quality of the services delivered and achieve specific quality goals.

4.5 Level 5: Optimizing

At level five, service providers learn to change their processes to increase service quality and service process performance (Process Change Management). Changes in the processes are triggered by improvement goals, new technologies or problems that need to be resolved. New technologies are evaluated and introduced into the organization when feasible (Technology Change Management). Problems that occur are prevented from recurring by changing the processes (Problem Prevention).

The level five key process areas are:

1. Process Change Management:
   Purpose: Continually improve the service processes used in the organization with the intent of improving service quality and increasing productivity.

2. Technology Change Management:
   Purpose: Identify new technologies and inject them into the organization in an orderly manner.

3. Problem Prevention:
   Purpose: Identify the cause of problems and prevent them from recurring by making the necessary changes to the processes.

Part II

The Key Practices of the IT Service CMM

Chapter 5

The Key Process Areas for Level 2: Repeatable

5.1 Service Commitment Management

Overview

The main purpose of Service Commitment Management is to ensure that the service commitments between service provider and customer, and hence the actual services delivered, are based on the IT service needs of the customer. The service commitments specify (amongst other things) the results of the services to be delivered. These results should contribute to fulfilling (parts of) the IT service needs of the customer.

The activities in this key process area are targeted at ensuring that the service commitments are based on the IT service needs, and stay in line with possibly changing IT service needs. This is enforced by periodic evaluations of the service commitments with respect to the IT service needs and by evaluations of the actual services delivered.

Goals

Goal 1 **Service commitments are documented.**

Goal 2 **Service commitments are based on current and future IT service needs of the customer.**

Commitment to Perform

Commitment 1 **A service manager is designated to be responsible for negotiating service commitments.**

The service commitments consist of external and internal commitments. External commitments can be both agreements with the customer on the services to be delivered, and agreements with third parties on out-sourced services. Internal commitments are agreements between internal groups and individuals on the resources and activities needed to accurately deliver the agreed services. The service commitments to the customer are set down in a service level agreement. Commitments by a third party are set down in a separate service level agreement between the organization and the third party, see also the key process area Subcontract Management. The internal commitments are described in the service delivery plan.

Commitment 2 **The IT service is specified and evaluated according to a written organizational policy.**

This policy minimally specifies that:

1. The IT service needs of the customer are identified and documented.
2. The IT service needs of the customer are reviewed by:
   - the customer, and,
   - the service manager.
3. The IT service needs of the customer are used as the basis for negotiating the service commitments with the customer.
4. The service commitments are documented.
5. The service commitments are reviewed by:
   - the customer,
   - the service manager,
   - senior management, and,
   - other affected groups.
6. The service commitments are evaluated on a periodic basis.

Ability to Perform

Ability 1 **Responsibilities for developing the service commitments are assigned.**

1. The service manager, directly or by delegation, coordinates the development of the service commitments.

Ability 2 **Adequate resources and funding are provided for developing the service commitments.**

Ability 3 **Service managers are trained to perform their service commitment management activities.**

Examples of training include:

- negotiating methods and techniques,
- the application domain.

Activities Performed

Activity 1 **The IT service needs of the customer are identified according to a documented procedure.**

This procedure minimally specifies that:

1. The IT service needs are identified in cooperation with the customer.
2. The IT service needs are reviewed by the customer.

Activity 2 **The IT service needs are documented.**

The IT service needs typically cover:

1. The business strategy and IT strategy of the customer.
2. The business processes supported by the IT.
3. The relevant IT components.
4. Expected changes to the business strategy, IT strategy, business processes, and IT components.
5. Current IT services used by the customer.

Activity 3 **The service commitments are documented.**

The service commitments minimally cover:

1. The purpose, scope, and goals of the services to be delivered.
2. Specification of the services to be delivered.
3. Specification of the quality levels of the services to be delivered.

   Service quality levels specify the minimum or maximum value for all relevant attributes of the service. Service quality levels should be specified in a measurable way, because the service levels of the delivered services have to be reported to the customer, see the key process area Service Tracking and Oversight. Examples of performance attributes of IT services include:
   - the guaranteed availability of a system,
   - the maximum responsetime of a system,
   - maximum processing times of service requests.

4. The service delivery schedule.

   The service delivery schedule specifies when certain service activities will take place that have an effect on the service levels. Examples of such activities are:
   - the delivery and installation of new software releases,
   - planned outage of systems for maintenance purposes,
   - upgrading hardware due to increasing performance demands.

   Note that the service delivery schedule both contains service activities that take place at a fixed moment in time, for example new releases, or activities that are executed when certain other conditions are met, for example installing additional hardware to meet increasing performance demands.

5. Specification of the service conditions.

   Service conditions are resolutive conditions that the customer has to fulfill (i.e. the service provider is exempted from delivering the service according to the service quality levels, if the customer does not fulfill the service conditions).

6. Specification of calamities.

   Calamities are situations in which the service provider is exempted from delivering the service according to the service quality levels. Note that these calamities are subject to negotiation. Examples of such situations are:

   - natural disasters such as earthquakes, storms, tidal waves,
   - civil unrest, strikes, riots, war,
   - power failures, telecommunication failures.

7. Agreements on reviewing actual service delivery.

   Part of the service commitments are agreements on how and when the service provider will report on the delivered services to the customer. The service delivery reports minimally cover the actual service levels as compared to the service levels specified in the service commitments.

   Refer to the key process area Service Tracking and Oversight for practices concerning the tracking of actual service delivery.

   Refer to Activity 13 of the key process area Service Tracking and Oversight for practices concerning the review of actual service delivery.

8. Planning of service evaluation.

   Part of the service commitments are agreements on how and when the service commitments will be evaluated.

   Refer to Activity 4.

Activity 4 **Service commitments are evaluated with the customer on both a periodic and an event-driven basis.**

The primary purpose of periodic and event-driven service evaluations of the service commitments with the customer is to ensure that the actual services delivered stay in line with current and future IT service needs of the customer.

1. The current IT service needs of the customer are identified and documented.

   Refer to Activity 1 and Activity 2.

2. The current IT service needs of the customer are compared with the previously identified IT service needs.
3. The current IT service needs of the customerare compared with the previously established service commitments.
4. If necessary, the service commitments are adapted to the new IT service needs.

Activity 5 **Actual service delivery is evaluated with the customer on both a periodic and an event-driven basis.**

1. Actual service delivery is compared with the service commitments.

> Refer to the key process area Service Tracking and Oversight for practices concerning the tracking of actual service delivery.

> Refer to Activity 13 of the key process area Service Tracking and Oversight for practices concerning the review of actual service delivery.

2. Service delivery risks are addressed.
3. Nonconformance to the service commitments is addressed.
4. Significant issues, action items, and decisions are identified and documented.
5. Action items are assigned, reviewed, and tracked to closure.

Measurement and Analysis

Measurement 1 **Measurements are made and used to determine the status of the service commitment management activities.**

> Examples of measurements include:
>
> - work completed, effort expended, and funds expended in the service commitment management activities compared to the plan.

Verifying Implementation

Verification 1 **The service commitment management activities are reviewed with senior management on a periodic basis.**

> The primary purpose of periodic reviews by senior management is to provide awareness of, and insight into, service process activities at an appropriate level of abstraction and in a timely manner. The time between reviews should meet the needs of the organization and may be lengthy, as long as adequate mechanisms for exception reporting are available.

1. The technical, cost, staffing, and schedule performance is reviewed.
2. Conflicts and issues not resolvable at lower levels are addressed.
3. Service delivery risks are addressed.
4. Action items are assigned, reviewed, and tracked to closure.
5. A summary report from each meeting is prepared and distributed to the affected groups and individuals.

Verification 2 **The service commitment management activities are reviewed with the service manager on both a periodic and event-driven basis.**

1. Affected groups are represented.
2. Status and current results of the service commitment management activities are reviewed.
3. Dependencies between groups are addressed.

4. Conflicts and issues not resolvable at lower levels are addressed.
5. Service delivery risks are reviewed.
6. Action items are assigned, reviewed, and tracked to closure.
7. A summary report from each meeting is prepared and distributed to the affected groups and individuals.

Verification 3 **The service quality assurance group reviews and/or audits the service commitment management activities and work products and reports the results.**

> Refer to the Service Quality Assurance key process area.

At a minimum, the reviews and/or audits verify:

1. The activities for reviewing and developing service commitments.

5.2 Service Delivery Planning

Overview

The key process area Service Delivery Planning has as its main purpose to plan the delivery of services specified in the service commitments. The service delivery planning includes the planning of service delivery activities and service delivery activities; estimation of resources needed, expected workload, effort and costs; the service delivery schedule; identification of risks, and plans for service facilities and tools. In addition, planning data needs to be recorded so that it can be used for the planning of future services.

Goals

Goal 1 **Service estimates are documented for use in planning and tracking the actual service delivery.**

Goal 2 **Service delivery activities and internal commitments are planned and documented.**

Goal 3 **Affected groups and individuals agree to their commitments related to the service delivery.**

Commitment to Perform

Commitment 1 **A service manager is designated to be responsible for negotiating internal commitments and developing the service delivery plan.**

Commitment 2 **The service delivery is planned according to a written organizational policy.**

This policy minimally specifies that:

1. The service commitments are used as a basis for planning the service delivery.

> Refer to Activity 3 of the Service Commitment Management key process area.

2. Internal commitments are negotiated between:
   - the service manager,
   - the service delivery manager,
   - the service task leaders, and
   - other affected groups.
3. Affected groups review the service delivery planning's:
   - effort and cost estimates,
   - schedules,
   - other commitments.

> Examples of affected groups include:
> - service delivery groups,
> - service estimating,
> - service testing,
> - service quality assurance group,
> - configuration management group,
> - documentation support.

4. The service delivery plan is managed and controlled.

> 'Managed and controlled' implies that the work product adheres to organizational documentation standards, that the version of the work product in use at a given time (past or present) is known (i.e. version control), and that changes are incorporated in a controlled manner (i.e. change control).
> If a greater degree of control than is implied by 'managed and controlled' is desired, the work product can be placed under the full discipline of configuration management, as is described in the Configuration Management key process area.

Ability to Perform

Ability 1 **Responsibilities for developing the service delivery plan are assigned.**

1. The service manager, directly or by delegation, coordinates the development of the service delivery plan.
2. Responsibilities for service activities are partitioned and assigned in a traceable, accountable manner.

Ability 2 **Adequate resources and funding are provided for planning the service delivery.**

1. Where feasible, experienced individuals, who have expertise in the application domain of the services being planned, are available to develop the service delivery plan.
2. Tools to support the service delivery planning activities are made available.

> Examples of support tools include:
> - spreadsheet programs,
> - estimating models, and
> - project planning and scheduling programs.

Ability 3 **The service managers, service engineers and other individuals involved in the service delivery planning are trained in the estimating and planning procedures applicable to their areas of responsibility.**

> Examples of training include:
>
> - the methods, standards, and procedures used, and
> - the application domain.

Activities Performed

Activity 1 **The service delivery plan is developed according to a documented procedure.**

This procedure minimally specifies that:

1. The service delivery plan is based on and conforms to:
   - the service delivery standards, as appropriate,
   - the service commitments.
2. Plans for service related and support groups involved in the service delivery activities are negotiated with those groups, the support efforts are budgeted, and the agreements are documented.

   > Examples of service related groups include:
   > - service quality assurance group,
   > - configuration management group, and,
   > - documentation support.
3. The service delivery plan is reviewed by:
   - the service manager,
   - the service delivery manager,
   - other service delivery managers,
   - other affected groups.
4. The service delivery plan is managed and controlled.

Activity 2 **The service delivery plan is documented.**

The service delivery plan covers:

1. The purpose, scope, and goals of the service delivery.
2. Identification of the selected procedures, methods, and standards for delivering the services.
3. Identification of service delivery activities to be performed.

   > Refer to Activity 3.
4. Estimated use of hardware and software resources.

   > Refer to Activity 4.
5. Estimated service delivery workload.

   > Refer to Activity 5.

6. Estimates of the service delivery effort and costs.

   Refer to Activity 6.

7. The service delivery schedule.

   Refer to Activity 7.

8. Identification and assessment of the service delivery risks.

   Refer to Activity 8.

9. Plans for the service delivery facilities and support tools.

   Refer to Activity 9.

Activity 3 **Service delivery activities to be performed are identified and planned according to a documented procedure.**

This procedure typically specifies that:

1. Service delivery activities are identified based on the service to be delivered and the service quality levels.
2. Service delivery activities are decomposed into subactivities to the granularity needed to meet the estimating objectives.
3. Historical data are used where available.
4. The service activity planning is documented, reviewed, and agreed to.

   Examples of groups and individuals who review and agree to the planning of service delivery activities include:
   - the service delivery manager, and
   - the service delivery group.

Activity 4 **Software and hardware products that are needed to establish and maintain control of the service delivery are identified.**

Refer to Activity 4 of the Configuration Management key process area.

Activity 5 **Estimates for the service delivery workload are derived according to a documented procedure.**

This procedure minimally specifies that:

1. Workload estimates are made for all service activities.

   Examples of service activities include:
   - activities for identifying, reviewing, tracking, and resolving service requests,
   - activities for maintaining IT components, and
   - activities for operating IT systems.

2. Historical data are used where available.
3. Workload assumptions are documented.

4. Workload estimates are documented, reviewed, and agreed to.

> Examples of groups and individuals who review and agree to workload estimates include:
> - the service manager, and
> - the service estimating group, and
> - the service engineers.

Activity 6 **Estimates for the service delivery effort and costs are derived according to a documented procedure.**

This procedure minimally specifies that:

1. Estimates for the service delivery effort and costs are related to the service delivery workload estimates.
2. Productivity data (historical and/or current) are used for the estimates when available; sources and rationales for these data are documented.
3. Effort, staffing, and cost estimates are based on past experience.
4. Estimates and the assumptions made in deriving the estimates are documented, reviewed, and agreed to.

Activity 7 **The service delivery schedule is derived according to a documented procedure.**

This procedure typically specifies that:

1. The service delivery schedule is related to:
   - the service delivery workload estimates, and
   - the service delivery effort and costs estimates.
2. The service delivery schedule is based on past experience.
   - Delivery of similar services to other customers are used when possible.
3. Assumptions made in deriving the service delivery schedule are documented.
4. The service delivery schedule is documented, reviewed, and agreed to.

Activity 8 **The risks associated with the cost, resource, schedule and technical aspects of the service are identified, assessed, and documented.**

1. The risks are analyzed and prioritized based on their potential impact to the service quality levels.
2. Contingencies for the risks are identified and arranged for.

> Examples of contingencies include:
> - schedule buffers,
> - making backups of datafiles,
> - alternative staffing plans, and
> - alternative plans for additional computing facilities.

Activity 9 **Plans for the service facilities and support tools are prepared.**

Activity 10 **Service planning data are recorded.**

1. Information recorded includes the estimates and the associated information needed to reconstruct the estimates and assess their reasonableness.
2. Service planning data are managed and controlled.

Measurement and Analysis

Measurement 1 **Measurements are made and used to determine the status of the service delivery planning activities.**

> Examples of measurements include:
>
> - completion of milestones for the service delivery planning activities compared to the plan, and,
> - work completed, effort expended, and funds expended in the service delivery planning activities compared to the plan.

Verifying Implementation

Verification 1 **The service delivery planning activities are reviewed with senior management on a periodic basis.**

> The primary purpose of periodic reviews by senior management is to provide awareness of, and insight into, service process activities at an appropriate level of abstraction and in a timely manner. The time between reviews should meet the needs of the organization and may be lengthy, as long as adequate mechanisms for exception reporting are available.

1. The technical, cost, staffing, and schedule performance is reviewed.
2. Conflicts and issues not resolvable at lower levels are addressed.
3. Service delivery risks are addressed.
4. Action items are assigned, reviewed, and tracked to closure.
5. A summary report from each meeting is prepared and distributed to the affected groups and individuals.

Verification 2 **The service delivery planning activities are reviewed with the service manager on both a periodic and event-driven basis.**

1. Affected groups are represented.
2. Status and current results of the service delivery planning activities are reviewed.
3. Dependencies between groups are addressed.
4. Conflicts and issues not resolvable at lower levels are addressed.
5. Service delivery risks are reviewed.
6. Action items are assigned, reviewed, and tracked to closure.

7. A summary report from each meeting is prepared and distributed to the affected groups and individuals.

Verification 3 **The service quality assurance group reviews and/or audits the service delivery planning activities and work products and reports the results.**

Refer to the Service Quality Assurance key process area.

At a minimum, the reviews and/or audits verify:

1. The activities for service estimating and planning.
2. The activities for preparing the service delivery plan.
3. The standards used for preparing the service delivery plan.
4. The content of the service delivery plan.

5.3 Service Tracking and Oversight

Overview

The main purpose of the Service Tracking and Oversight key process area is to provide information about the actual service delivery. This information is to be used to report actual service levels to the customer and to monitor the actual service delivery and take corrective actions as soon as possible. If necessary, the service delivery plan is adjusted.

Goals

Goal 1 **Actual service deliveryis tracked against the specified service levels and reported to the customer.**

Goal 2 **Corrective actions are taken and managed to closure to prevent actual service delivery to deviate from the specified service levels.**

Goal 3 **Changes to the service delivery planning are agreed to by the affected groups and individuals.**

Commitment to Perform

Commitment 1 **A service delivery manager is designated to be responsible for the actual service delivery.**

Commitment 2 **The service delivery is managed according to a written organizational policy.**

This policy typically specifies that:

1. A documented service delivery plan is used and maintained as the basis for tracking the actual service delivery.
2. The service manager is kept informed of the service delivery status and issues.

3. Corrective actions are taken when the service delivery plan is not being achieved, either by adjusting the plans or by initiating a service evaluation.

> Refer to Activity 4 of the Service Commitment Management key process area.

4. Changes to the service delivery planning are made with the involvement and agreement of the affected groups.

> Examples of affected groups include:
> - service delivery group,
> - service estimating,
> - service quality assurance group,
> - configuration management group.

Ability to Perform

Ability 1 **A service delivery plan is documented and approved.**

> Refer to Activities 1 and 2 of the Service Delivery Planning key process area for practices covering the service delivery plan.

Ability 2 **The service manager explicitly assigns responsibility for the service delivery activities.**

The assigned responsibilities cover:

1. The service delivery activities to be performed.
2. The effort and cost for these activities.
3. The schedule for these activities.
4. The budget for these activities.
5. The usage of hardware and software resources.

Ability 3 **Adequate resources and funding are provided for tracking actual service delivery.**

1. The service delivery managers and service task leaders are assigned specific responsibilities for tracking actual service delivery.
2. Toolsto support service tracking are made available.

> Examples of support tools include:
> - spreadsheet programs,
> - network monitoring software,
> - event management (‘service desk’) software,
> - project planning/scheduling programs.

Ability 4 **The service managers are trained in managing the technical and personal aspects of the service delivery.**

Examples of training include:

- managing technical projects,
- tracking and oversight of service results, costs, effort, and schedule, and
- managing people.

Ability 5 **First-line service managers receive orientation on the technical aspects of the service delivery.**

Examples of orientation include:

- the service delivery standards and procedures, and
- the service application domains.

Activities Performed

Activity 1 **A documented service delivery plan is used for tracking the service delivery activities and communicating status.**

Refer to Activity 2 of the Service Delivery Planning key process area for practices covering the content of the service delivery plan.

This service delivery plan is:

1. Updated as the service delivery progresses to reflect accomplishments.
2. Readily available to:
   - the service delivery group,
   - the service managers,
   - the service delivery managers,
   - senior management, and,
   - other affected groups.

Activity 2 **The service delivery plan is revised according to a documented procedure.**

Refer to Activity 1 of the Service Delivery Planning key process area for practices covering the activities for producing the service delivery plan.

This procedure typically specifies that:

1. The service delivery plan is revised, as appropriate, to incorporate plan refinements and incorporate plan changes, particularly when plans change significantly.
2. The service delivery plan is updated to incorporate all new service commitments and changes to commitments.
3. The service delivery plan is reviewed at each revision.
4. The service delivery plan is managed and controlled.

Activity 3 **Approved changes to the service delivery plan are communicated to the members of the service delivery group and other related groups.**

> Examples of other related groups include:
>
> - service quality assurance group,
> - configuration management group, and
> - documentation support.

Activity 4 **Actual service levels are tracked against the specified service levels, and corrective actions are taken as necessary.**

1. Actual service levels are tracked and compared to the service levels documented in the service commitments.
2. Effects of higher or lower actual service levels are evaluated for impacts on future activities or service levels.
3. Changes in actual service levels that affect service commitments are negotiated with affected groups and are documented.

Activity 5 **The service delivery workload is tracked, and corrective actions are taken as necessary.**

> Refer to Activity 5 of the Service Delivery Planning key process area for practices covering the derivation of service workload estimates.

1. Actual workload over time is compared to the estimates documented in the service delivery plan.
2. Effects of higher or lower workload is evaluated for impacts on future activities and service levels.
3. Changes in workload that affect service commitments are negotiated with the affected groups and are documented.

Activity 6 **The service delivery activities costs and effort are tracked, and corrective actions are taken as necessary.**

> Refer to Activity 6 of the Service Delivery Planning key process area for practices covering the derivation of cost and effort estimates.

1. Actual expenditure of effort and costs over time and against service delivery activities performed are compared to the estimates documented in the service delivery plan to identify potential overruns and underruns.
2. Service costs are tracked and compared to the estimates documented in the service delivery plan.
3. Effort and staffing are tracked and compared to the estimates documented in the service delivery plan.
4. Changes in staffing and other service costs that affect service commitments are negotiated with the affected groups and are documented.

Activity 7 **The service facilities are tracked, and corrective actions are taken as necessary.**

> Refer to Activity 9 of the Service Delivery Planning key process area for practices covering the planning of service facilities.

1. The actual and projected use of service facilities are tracked and compared to the estimates as documented in the service delivery plan.
2. Changes in the estimated use of service facilities that affect the service commitments are negotiated with the affected groups and are documented.

Activity 8 **The service delivery schedule is tracked, and corrective actions are taken as necessary.**

> Refer to Activity 7 of the Service Delivery Planning key process area for practices covering the derivation of the service delivery schedule.

1. Actual completion of service activities, milestones, and other commitments is compared against the service delivery plan.
2. Effects of late and early completion of service delivery activities, milestones, and other commitments are evaluated for impact on future activities and service levels.
3. Service schedule revisions that affect service commitments are negotiated with the affected groups and are documented.

Activity 9 **The service delivery activities are tracked, and corrective actions are taken as necessary.**

> Refer to Activity 3 of the Service Delivery Planning key process area for practices covering the planning of service delivery activities.

1. Members of the service delivery group report the status of their service delivery activities to their first-line manager on a periodic basis.
2. Deviations from the service delivery planning in any of the service delivery activities are identified, recorded, reviewed, and tracked to closure.

   > Refer to Activity 4 of the Event Management key process area for practices covering the management of events.

Activity 10 **The service delivery risks associated with cost, resource, schedule and technical aspects of the services are tracked.**

> Refer to Activity 8 of the Service Delivery Planning key process area for practices covering the identification and assessment of service delivery risks.

1. The priorities of the risks and contingencies for the risks are adjusted as additional information becomes available.
2. High-risk areas are reviewed with the service delivery manager on a periodic basis.

Activity 11 **Actual measurement data and replanning data for the service are recorded and made available.**

> Refer to Activity 10 of the Service Delivery Planning key process area for practices covering the recording of service planning data.

1. Information recorded includes the estimates and associated information needed to reconstruct the estimates and verify their reasonableness.
2. The service replanning data are managed and controlled.
3. The service planning data, replanning data, and the actual measurement data are archived for use by ongoing and future services.
4. The service planning data, replanning data, and the actual measurement data are made available to affected groups.

Activity 12 **The service delivery group conducts periodic internal reviews to track activity status, plans, actual service levels, and issues against the service delivery plan.**

These reviews are conducted between:

1. The first-line service delivery managers and their service task leaders.
2. The service delivery managers, first-line service delivery managers, and other service managers, as appropriate.

Activity 13 **Formal reviews to address the accomplishments and results of the services are conducted with the customer at selected moments according to a documented procedure.**

These reviews:

1. Are planned to occur at meaningful points in the service delivery schedule.
2. Are conducted with the customerand end users, as appropriate.

   > The end users referred to in these practices are the customer designated end users or representatives of the end users.
3. Use materials that are reviewed and approved by the responsible service delivery managers.
4. Address the service commitments and actual service delivery.
5. Result in the identification and documentation of significant issues, action items, and decisions.
6. Address the service delivery risks.
7. Result in the refinement of the service delivery plan, as necessary.
8. Result in an evaluation of service commitments and actual service delivery, as necessary.

   > Refer to Activity 4 of the Service Commitment Management key process area for practices concerning the evaluation of service commitments and actual service delivery.

Activity 14 **Formal reviews to address the accomplishments and results of the services are conducted at selected moments according to a documented procedure.**

These reviews:

1. Are planned to occur at meaningful points in the service delivery schedule.
2. Are conducted with affected groups within the organization.
3. Address and actual service delivery] the service commitments and actual service delivery.
4. Result in the identification and documentation of significant issues, action items, and decisions.
5. Address the service delivery risks.
6. Result in the refinement of the service delivery plan, as necessary.
7. Result in an evaluation of service commitments and actual service delivery, as necessary.

> Refer to Activity 4 of the Service Commitment Management key process area for practices concerning the evaluation of service commitments and actual service delivery.

Measurement and Analysis

Measurement 1 **Measurements are made and used to determine the status of the service tracking and oversight activities.**

> Examples of measurements include:
>
> - effort and other resources expended in performing the service tracking and oversight activities, and
> - change activity for the service delivery plan, which includes changes to workload estimates, effort and cost estimates, and schedule.

Verifying Implementation

Verification 1 **The service tracking and oversight activities are reviewed with senior management on a periodic basis.**

1. The technical, cost, staffing, schedule, and service delivery performance is reviewed.
2. Conflicts and issues not resolvable at lower levels are addressed.
3. Service delivery risks are addressed.
4. Action items are assigned, reviewed, and tracked to closure.
5. A summary status report from each meeting is prepared and distributed to the affected groups.

Verification 2 **The service tracking and oversight activities are reviewed with the service manager on both a periodic and event-driven basis.**

1. Affected groups are represented.
2. The technical, cost, staffing, schedule, and service delivery performance is reviewed against the service delivery plan.
3. Use of hardware and software resources is reviewed; current estimates and actual use of these resources is reported against the original estimates.
4. Dependencies between groups are addressed.
5. Conflicts and issues not resolvable at lower levels are addressed.
6. Service delivery risks are addressed.
7. Action items are assigned, reviewed, and tracked to closure.
8. A summary status report from each meeting is prepared and distributed to the affected groups.

Examples of situations that can lead to a review of the service tracking and oversight activities are:

- a considerable difference between the reported actual service delivery and the perception of the customer of the actual service delivery, and
- a considerable difference between the reported actual service delivery and the perception of affected groups of the actual service delivery.

Verification 3 **The service quality assurance group reviews and/or audits the service tracking and oversight activities and work products and reports the results.**

At a minimum, the reviews and/or audits verify:

1. The activities for reviewing and revising commitments.
2. The activities for revising the service delivery plan.
3. The content of the revised service delivery plan.
4. The activities for tracking the service delivery cost, schedule, risks, technical constraints, and service levels.
5. The activities for conducting the planned technical and management reviews.

5.4 Subcontract Management

Overview

The key process area Subcontract Management describes the activities that a service provider – the prime contractor – should implement when (part of) a service, to be delivered to a customer of the prime contractor, is subcontracted to a third party – the service subcontractor. The prime contractor and the service subcontractor negotiate service commitments between eachother. The prime contractor remains responsible for the service to be delivered to the customer.

Goals

Goal 1 **The prime contractor selects qualified service subcontractors.**

Goal 2 **The prime contractor and the service subcontractor agree to their commitments to each other.**

Goal 3 **The prime contractor and the service subcontractor maintain ongoing communications.**

Goal 4 **The prime contractor tracks the service subcontractor's actual results and performance against its commitments.**

Commitment to Perform

Commitment 1 **A written organizational policy is followed for managing the service subcontract.**

This policy typically specifies that:

1. Documented standards and procedures are used in selecting service subcontractors and managing the service subcontracts.
2. The contractual agreements between the prime contractor and the customer form the basis for managing the service subcontract.
3. Changes to the service subcontract are made with the involvement and agreement of both the prime contractor and the service subcontractor.

Commitment 2 **A subcontract manager is designated to be responsible for establishing and managing the service subcontract.**

1. The subcontract manager is knowledgeable and experienced in IT service delivery or has individuals assigned who have that knowledge and experience.
2. The subcontract manager is responsible for coordinating the technical scope of the service to be subcontracted and the terms and conditions of the service subcontract with the affected parties.

   > The service delivery group defines the technical scope of the activities to be subcontracted. The appropriate business function groups, such as purchasing, finance, and legal, establish and monitor the terms and conditions of the subcontract.

3. The subcontract manager is responsible for:
   - selecting the service subcontractor, and
   - managing the service subcontract.

Ability to Perform

Ability 1 **Adequate resources and funding are provided for selecting the service subcontractor and managing the service subcontract.**

1. Service managers and other individuals are assigned specific responsibilities for managing the service subcontract.
2. Tools to support managing the service subcontract are made available.

> Examples of support tools include:
> - estimating tools,
> - spreadsheet programs, and
> - project management and scheduling programs.

Ability 2 **Service managers and other individuals who are involved in establishing and managing the service subcontract are trained to perform these activities.**

> Examples of training include:
> - preparing and planning for service subcontracting,
> - evaluating a subcontract bidder's service process capability,
> - evaluating a subcontract bidder's service delivery estimates and plans,
> - selecting a service subcontractor, and
> - managing a service subcontract.

Ability 3 **Service managers and other individuals who are involved in managing the service subcontract receive orientation in the technical aspects of the service subcontract.**

> Examples of orientation include:
> - application domain,
> - hardware and software technology involved,
> - software tools being used,
> - methodologies being used, and
> - standards and procedures being used.

Activities Performed

Activity 1 **The service to be subcontracted is specified and planned according to a documented procedure.**

This procedure typically specifies that:

1. Services to be subcontracted are selected based on a balanced assessment of both technical and nontechnical characteristics of the service to be delivered.
   - The services to be subcontracted are selected to match the skills and capabilities of potential service subcontractors.
   - The specification of the services to be subcontracted is determined based on a systematic analysis and appropriate decomposition of the service to be delivered and the service commitments.
2. The specification of the service to be subcontracted and the standards and procedures to be followed are derived from the:

- service commitments,
- service delivery plan, and
- service standards and procedures.

3. The specification of the service to be subcontracted is:
   - prepared,
   - reviewed,
   - agreed to,

     Examples of individuals who review and agree to the specification of the service to be subcontracted include:
     - the service delivery manager,
     - the configuration management manager,
     - the service quality assurance manager, and
     - the subcontract manager.

   - revised when necessary, and
   - managed and controlled.
4. A plan for selecting a service subcontractor is prepared concurrent with the service commitments and is reviewed, as appropriate.

Activity 2 **The service subcontractor is selected, based on an evaluation of the service subcontract bidders' ability to deliver the service, according to a documented procedure.**

This procedure covers the evaluation of:

1. Proposals submitted for the planned service subcontract.
2. Prior performance records on similar services, if available.
3. The geographic locations of the service subcontract bidders' organizations relative to the prime contractor and/or the customer.

   Effective management of some subcontracts may require frequent face-to-face interactions.

4. Service delivery capabilities.
5. Staff available to perform the service activities.
6. Prior experience with similar services.
7. Available resources.

   Examples of resources include:
   - facilities,
   - hardware,
   - software, and
   - training.

Activity 3 **The contractual agreement between the prime contractor and the service subcontractor is used as the basis for managing the service subcontract.**

The contractual agreement documents:

1. The subcontract service commitments.

   > Refer to Activity 3 of the Service Commitment Management key process area for practices covering the typical content of service commitments.

2. The standards and procedures to be used to integrate the service to be subcontracted and the services delivered by the prime contractor.

   > Examples of procedures include:
   > - event management procedures,
   > - configuration management procedures, and
   > - reporting procedures.

Activity 4 **A documented service subcontractor's service delivery plan is reviewed and approved by the prime contractor.**

1. This service delivery plan covers (directly or by reference) the appropriate items from the prime contractor's service delivery plan.

   > In some cases, the prime contractor's service delivery plan may include the service delivery plan for the service subcontractor, and no separate service subcontractor's service delivery plan is needed.

   > Refer to Activity 2 of the Service Delivery Planning key process area for practices covering the content of the service delivery plan.

Activity 5 **A documented and approved service subcontractor's service delivery plan is used for tracking the service activities and communicating status.**

> Refer to the Service Tracking and Oversight key process area for practices concerning the tracking of services.

Activity 6 **Changes to the service subcontractor's service commitments, service delivery plan, and other commitments are resolved according to a documented procedure.**

1. This procedure typically specifies that all affected groups of both the prime contractor and the service subcontractor are involved.

Activity 7 **Subcontract service commitments are evaluated with the service subcontractor on both a periodic and an event-driven basis.**

> The primary purpose of periodic and event-driven service evaluations of the service commitments with the service subcontractor is to ensure that the subcontract service commitments stay in line with current and future IT service needs of the customer.

> Refer to Activity 4 of the Service Commitment Management key process area for practices covering evaluation of the service commitments.

Activity 8 **Actual service delivery of the subcontracted services is evaluated with the service subcontractor on both a periodic and an event-driven basis.**

Refer to Activity 5 of the Service Commitment Management key process area for practices covering evaluation of the actual service delivery.

Activity 9 **Formal reviews to address the accomplishments and results of the services are conducted with the service subcontractor at selected moments according to a documented procedure.**

These reviews:

1. Are planned to occur at meaningful points in the service delivery schedule.
2. Are conducted with the service subcontractor.
3. Use materials that are reviewed and approved by the responsible service delivery managers.
4. Nonconformance to the service subcontract is addressed.
5. Result in the identification and documentation of significant issues, action items, and decisions.
6. Address the service delivery risks.
7. Address critical dependencies and commitments between the service subcontractor and the prime contractor.
8. Result in the refinement of the service delivery plan, as necessary.
9. Result in an evaluation of subcontract service commitments and actual service delivery, as necessary.

   Refer to Activity 7 and 8.
10. Action items are assigned, reviewed, and tracked to closure.

Activity 10 **The prime contractor's service quality assurance group monitors the service subcontractor's service quality assurance activities according to a documented procedure.**

This procedure typically specifies that:

1. The service subcontractor's plans, resources, procedures, and standards for service quality assurance are periodically reviewed to ensure that they are adequate to monitor the service subcontractor's performance.
2. Regular reviews of the service subcontractor are conducted to ensure the approved procedures and standards are being followed.
   - The prime contractor's service quality assurance group spot checks the subcontractor's service delivery activities.
   - The prime contractor's service quality assurance group audits the subcontractor's service quality assurance records, as appropriate.
3. The service subcontractor's records of its service quality assurance activities are periodically audited to assess how well the service quality assurance plans, standards, and procedures are being followed.

Activity 11 **The prime contractor's configuration management group monitors the service subcontractor's configuration management activities according to a documented procedure.**

This procedure typically specifies that:

1. The service subcontractor's plans, resources, procedures, and standards for configuration management are reviewed to ensure they are adequate.
2. The prime contractor and the service subcontractor coordinate their activities on matters relating to configuration management to ensure that the configuration baselines are consistent, as appropriate.
3. The service subcontractor's configuration baseline is periodically audited to assess how well the standards and procedures for configuration management are being followed and how effective they are in managing the configuration baseline.

Activity 12 **The prime contractor's event management group monitors the service subcontractor's event management activities according to a documented procedure.**

This procedure typically specifies that:

1. The service subcontractor's plans, resources, procedures, and standards for event management are reviewed to ensure they are adequate.
2. The prime contractor and the service subcontractor coordinate their activities on matters relating to event management to ensure that the event management activities are sufficiently integrated.
3. The service subcontractor's event management library is periodically audited to assess how well the standards and procedures for event management are being followed and how effective they are in event management.

Measurement and Analysis

Measurement 1 **Measurements are made and used to determine the status of the subcontract management activities.**

Examples of measurements include:

- work completed, effort expended, and funds expended in the subcontract management activities compared to the plan.

Measurement 2 **Measurements are made and used to determine the service subcontractor's performance.**

Examples of measurements include:

- average leadtime of events handled by the service subcontractor, and
- actual service levels for subcontracted services compared to the plan.

Verifying Implementation

Verification 1 **The subcontract management activities are reviewed with senior management on a periodic basis.**

> Refer to Activity 1 of the Service Tracking and Oversight key process area for practices covering the typical content of senior management oversight reviews.

Verification 2 **The subcontract management activities are reviewed with the service delivery manager on both a periodic and event-driven basis.**

> Refer to Activity 2 of the Service Tracking and Oversight key process area for practices covering the typical content of service management oversight reviews.

Verification 3 **The service quality assurance group reviews and/or audits the subcontract management activities and work products and reports the results.**

> Refer to the Service Quality Assurance key process area.

At a minimum, the reviews and/or audits verify:

1. The activities for selecting the service subcontractor.
2. The activities for managing the service subcontract.
3. The activities for coordinating configuration management and event management activities of the prime contractor and service subcontractor.
4. The conduct of planned reviews with the service subcontractor.
5. The conduct of reviews that establish accomplishment of service levels by the service subcontractor.

5.5 Configuration Management

Overview

The main purpose of the Configuration Management key process area is to establish control over all IT products that are needed to properly deliver the services. These IT products are identified and recorded in the configuration baseline. In addition, changes to the IT products are controlled.

Goals

Goal 1 **Configuration management activities are planned.**

Goal 2 **Selected hardware and software products are identified, controlled, and available.**

Goal 3 **Changes to the identified hardware and software products are controlled.**

Goal 4 **Affected groups and individuals are informed of the status and content of configuration baselines.**

Commitment to Perform

Commitment 1 **A written organizational policy is followed for implementing configuration management (CM).**

This policy typically specifies that:

1. Responsibility for CM for each service is explicitly assigned.
2. CM is implemented throughout the service's life cycle.
3. CM is implemented for all external hardware and software subject to the service commitments, and designated internal hardware and software used for service delivery.
4. A repository for storing configuration items and/or the associated CM records is made available.

   > The contents of this repository are referred to as the 'configuration baseline' in these practices.
   > The tools and procedures for accessing this repository are referred to as the 'configuration management library system' in these practices.

   > Work products that are placed under configuration management are referred to as configuration items.

5. The configuration baselines and CM activities are audited on a periodic basis.

Ability to Perform

Ability 1 **A board having the authority for managing the configuration baseline exists or is established.**

The Configuration Control Board (CCB):

1. Authorizes the establishment of configuration baselines and the identification of configuration items.
2. Represents the interests of the service manager and all groups who may be affected by changes to the configuration baselines.

   > Examples of affected groups include:
   > - service delivery group,
   > - event management group,
   > - end users.

3. Reviews and authorizes changes to the configuration baseline.
4. Authorizes the creation of products from the configuration baseline.

Ability 2 **A group that is responsible for coordinating and implementing CM for the service (i.e., the CM group) exists.**

The CM group coordinates or implements:

1. Creation and management of the service's configuration baseline library.
2. Development, maintenance, and distribution of the CM plans, standards, and procedures.

3. The identification of the set of software and hardware products to be placed under CM.
4. Management of the access to the configuration baseline library.
5. Updates of the configuration baseline.
6. Creation of products from the configuration baseline library.
7. Recording of CM activities.
8. Production and distribution of CM reports.

Ability 3 **Adequate resources and funding are provided for performing the CM activities.**

1. A manager is assigned specific responsibilities for CM.
2. Tools to support the CM activities are made available.

> Examples of support tools include:
> - workstations and/or portable computers,
> - database programs,
> - configuration management tools.

Ability 4 **Members of the CM group and related groups are trained in the objectives, procedures, and methods for performing their CM activities.**

> Examples of related groups include:
> - service quality assurance group,
> - documentation support, and
> - service engineers.

> Examples of training include:
> - the standards, procedures, and methods to be followed for CM activities, and
> - the role, responsibilities, and authority of the CM group.

Activities Performed

Activity 1 **A CM plan is prepared for each service according to a documented procedure.**

This procedure typically specifies that:

1. The CM plan is developed in the early stages of, and in parallel with, the overall service delivery planning.
2. The CM plan is reviewed by the affected groups.
3. The CM plan is managed and controlled.

Activity 2 **A documented and approved CM plan is used as the basis for performing the CM activities.**

The plan covers:

1. The CM activities to be performed, the schedule of activities, the assigned responsibilities, and the resources required (including staff, tools, and computer facilities).
2. The CM requirements and activities to be performed by the service delivery group and other related groups.

Activity 3 **A configuration management library system is established as a repository for the configuration baselines.**

This library system:

1. Supports multiple control levels of CM.

   Examples of situations leading to multiple levels of control include:
   - differences in the levels of control needed for different IT systems,
   - differences in the levels of control needed for different IT needs of the customer.

2. Provides for the storage and retrieval of configuration items.
3. Provides for the sharing and transfer of configuration items between the affected groups and between control levels within the library.
4. Helps in the use of product standards for configuration items.
5. Provides for the storage and recovery of archive versions of configuration items.
6. Helps to ensure correct creation of products from the software baseline library.
7. Provides for the storage, update, and retrieval of CM records.
8. Supports production of CM reports.
9. Provides for the maintenance of the library structure and contents.

Activity 4 **The products to be placed under configuration management are identified.**

1. The configuration items are selected based on documented criteria.

   Examples of work products that may be identified as configuration items include:
   - process-related documentation (e.g. plans, standards, or procedures),
   - software requirements,
   - test procedures,
   - support tools,
   - hardware components (e.g. workstations, network components, auxiliaries).

2. The configuration items are assigned unique identifiers.
3. The characteristics of each configuration item are specified.
4. The configuration baselines to which each configuration item belongs are specified.
5. The period in its life-cycle that each configuration item is placed under configuration managementis specified.

6. The person responsible for each configuration item (i.e. the owner, from a configuration management point of view) is identified.

Activity 5 **Action items for all configuration items/units are initiated, recorded, reviewed, approved, and tracked to closure according to a documented procedure.**

> Refer to the key process area Event Management for practices concerning the management of action items.

Activity 6 **Changes to configuration baselines are controlled according to a documented procedure.**

This procedure typically specifies that:

1. Reviews and/or tests are performed to ensure that changes have not caused unintended effects on the configuration baseline.
2. Only configuration items that are approved by the CCB are entered into the baseline library.
3. Configuration items are checked in and out in a manner that maintains the correctness and integrity of the baseline library.

   > Examples of check-in/out steps include:
   > - verifying that the revisions are authorized,
   > - creating a change log,
   > - maintaining a copy of the changes,
   > - updating the baseline library, and
   > - archiving the replaced baseline.

Activity 7 **Products from the configuration baseline are created and released according to a documented procedure.**

This procedure typically specifies that:

1. The CCB authorizes the creation of products from the baseline library.
2. Products from the baseline library, for both internal and external use, are built only from configuration items in the baseline library.

Activity 8 **The status of configuration items/units is recorded according to a documented procedure.**

This procedure typically specifies that:

1. The configuration management actions are recorded in sufficient detail so that the content and status of each configuration item are known and previous versions can be recovered.
2. The current status and history (i.e. changes and other actions) of each configuration item are maintained.

Activity 9 **Standard reports documenting the CM activitiesand the contents of the configuration baselines are developed and made available to affected groups and individuals.**

Examples of reports include:

- CCB meeting minutes,
- change request summary and status,
- trouble report summary and status (including fixes),
- summary of changes made to the baseline,
- revision history of configuration items,
- baseline status, and
- results of baseline audits.

Activity 10 **Configuration baseline audits are conducted according to a documented procedure.**

This procedure typically specifies that:

1. There is adequate preparation for the audit.
2. The integrity of the baselines is assessed.
3. The structure of and facilities of the configuration management library system are reviewed.
4. The completeness and correctness of the baseline library contents are verified.
5. Compliance with applicable CM standards and procedures is verified.
6. The results of the audit are reported to the service manager.
7. Action items from the audit are tracked to closure.

Measurement and Analysis

Measurement 1 **Measurements are made and used to determine the status of the CM activities.**

Examples of measurements include:

- number of change requests processed per unit time,
- completions of milestones for the CM activities compared to the plan, and
- work completed, effort expended, and funds expended in the CM activities.

Verifying Implementation

Verification 1 **The CM activities are reviewed with senior management on a periodic basis.**

Verification 2 **The CM activities are reviewed with the service manager on both a periodic and event-driven basis.**

Verification 3 **The CM group periodically audits configuration baselines to verify that they conform to the documentation that defines them.**

Verification 4 **The service quality assurance group reviews and/or audits the CM activities and work product and reports the results.**

Refer to the Service Quality Assurance key process area.

At a minimum, the reviews and/or audits verify:

1. Compliance with the CM standards and procedures by:
   - the CM group,
   - the CCB,
   - the service delivery group, and
   - other related groups.
2. Occurrence of periodic configuration baseline audits.

5.6 Event Management

Overview

The main purpose of the key process area Event Management is to identify, record, track, analyse, and resolve events that occur during service delivery. An event is an occurrence that – if not resolved – eventually will cause the service provider to break its service commitments. Note that it does not matter whether the service provider knows that the event has happened. Two types of events are distinguished: service requests and incidents. Service requests are requests by the customer for certain service activities to be performed. Note that these activities should fall within the bounds of the service commitments. For example, the customer asks for an extra workplace to be installed. Incidents are events that need to be resolved in order to meet the service commitments. For example, if a system goes down it has to be restarted before the maximum downtime will be exceeded.

Events are always concerned with one or more IT components. Events are resolved by action items.

Goals

Goal 1 **Event management activities are planned.**

Goal 2 **Events are identified, recorded, analyzed, tracked, and resolved.**

Goal 3 **Affected groups and individuals are informed of the status of events and action items.**

Commitment to Perform

Commitment 1 **A written organizational policy is followed for implementing event management (EM).**

This policy typically specifies that:

1. Responsibility for EM for each service is explicitly assigned.
2. EM is implemented throughout the duration of the service commitments.
3. A repository for storing event information is made available.
4. The event repository and EM activities are audited on a periodic basis.

Ability to Perform

Ability 1 **A group that is responsible for coordinating and implementing EM for the service (i.e., the EM group) exists.**

The EM group coordinates or implements:

1. Creation and management of the service's event repository.
2. Development, maintenance, and distribution of EM plans, standards, and procedures.
3. Management of the access to the event repository.
4. Changes to the event repository.
5. Recording of EM activities.
6. Production and distribution of EM reports.

Ability 2 **Adequate resources and funding are provided for performing the EM activities.**

1. A manager is assigned specific responsibility for EM.
2. Tools to support the EM activities are made available.

> Examples of support tools include:
> - workstations and/or portable computers,
> - event management software.

Ability 3 **Members of the EM group and related groups are trained in the objectives, procedures, and methods for performing their EM activities.**

> Examples of related groups include:
> - service quality assurance group,
> - configuration management group,
> - end-users, and
> - service engineers.

> Examples of training include:
> - the standards, procedures, and methods to be followed for EM activities, and
> - the role, responsibilities, and authority of the EM group.

Activities Performed

Activity 1 **An EM plan is prepared for each service according to a documented procedure.**

This procedure typically specifies that:

1. The EM plan is developed in the early stages of, and in parallel with, the overall service delivery planning.

2. The EM plan is reviewed by affected groups.
3. The EM plan is managed and controlled.

Activity 2 **A documented and approved EM plan is used as the basis for performing the EM activities.**

The plan covers:

1. Estimates of the event workload.
2. The EM activities to be performed, the schedule of the activities, the assigned responsibilities, and the resources required (including staff, tools, and computer facilities).

Activity 3 **An event management library system is established as a repository for the event records.**

This library system:

1. Provides for the storage, update, and retrieval of event records.
2. Provides for the sharing and transfer of event records between affected groups.
3. Helps in the use of event management procedures.

   Refer to activity 4.
4. Provides for the archival and retrieval of historic event information.
5. Supports production of EM reports.

Activity 4 **Events are identified, recorded, analyzed, reviewed, and resolved according to a documented procedure.**

This procedure typically specifies that:

1. The events are recorded in sufficient detail so that the content and the status of each event are known. This typically includes:
   - a unique identifier,
   - description of the event,
   - date and time of occurrence,
   - name and contact information of the person who reported the event,
   - the configuration items concerned, and
   - relevant characteristics of the situation in which the event occurred.
2. The impact of the event to the service commitments is assessed and documented.
3. Action items resulting from events are:
   - identified,
   - assessed for risk,
   - documented,
   - planned,
   - initiated,

- communicated to the affected groups and individuals,
- tracked to closure, and
- evaluated.

Activity 5 **Affected groups and individuals are informed of the status of events on both a periodic and event-driven basis.**

Examples of affected groups and individuals include:

- configuration management group,
- service delivery group,
- service manager,
- end users.

Activity 6 **Standard reports documenting the EM activities and the contents of the event repository are developed and made available to affected groups and individuals.**

Examples of reports include:

- event description and status,
- action item description and status,
- summary of events by configuration item,
- summary of events during a certain period.

Activity 7 **Event repository audits are conducted according to a documented procedure.**

This procedure typically specifies that:

1. There is adequate preparation for the audit.
2. The integrity of the event repository is assessed.
3. The facilities of the event management library system are reviewed.
4. The completeness and correctness of the repository are verified.
5. Compliance with applicable EM standards and procedures is verified.
6. The results of the audit are reported to the service manager.
7. Action items from the audit are tracked to closure.

Measurement and Analysis

Measurement 1 **Measurements are made and used to determine the status of the events in the event repository.**

Examples of measurements include:

- number of events unresolved,
- average leadtime of closed events,
- percentage of events not closed within the maximum time.

Measurement 2 **Measurements are made and used to determine the status of the EM activities.**

Examples of measurements include:

- number of events processed per unit time,
- number of action items completed per unit time,
- effort expended and funds expended in the EM activities.

Verifying Implementation

Verification 1 **The EM activities are reviewed with senior management on a periodic basis.**

Verification 2 **The EM activities are reviewed with the service manager on both a periodic and event-driven basis.**

Verification 3 **The EM group periodically audits event repositories to verify that they conform to the documentation that defines them.**

Verification 4 **The service quality assurance group reviews and/or audits the EM activities and work products and reports the results.**

5.7 Service Quality Assurance

Overview

The main purpose of the key process area Service Quality Assurance is to provide management with the appropriate visibility into the processes being used and the services delivered. The independent service quality assurance group reviews and audits working procedures, standards, and service delivery activities to see that they comply with the applicable procedures and standards. The results of these reviews and audits are reported to the involved groups and individuals and to senior management. Senior management is responsible for acting upon the results of the service quality assurance activities.

Goals

Goal 1 **Service quality assurance activities are planned.**

Goal 2 **Adherence of services and service activities to the applicable standards, procedures and service commitments is verified objectively.**

Goal 3 **Affected groups and individuals are informed of service quality assurance activities and results.**

Goal 4 **Noncompliance issues that cannot be resolved within the service delivery group are addressed by senior management.**

Commitment to Perform

Commitment 1 **A written organizational policy is followed for implementing service quality assurance (SQA).**

This policy typically specifies that:

1. The SQA function is in place on all services delivered.
2. The SQA group has a reporting channel to senior management that is independent of the service manager, the service's service delivery group, and the other service related groups.

Commitment 2 **Senior management periodically reviews the SQA activities and results.**

Ability to Perform

Ability 1 **A group that is responsible for coordinating and implementing SQA for the service (i.e. the SQA group) exists.**

Ability 2 **Adequate resources and funding are provided for performing the SQA activities.**

1. A manager is assigned specific responsibilities for the service's SQA activities.
2. A senior manager, who is knowledgeable in the SQA role and has the authority to take appropriate oversight actions, is designated to receive and act on service noncompliance issues.
   - All managers in the SQA reporting chain to the senior manager are knowledgeable in the SQA role, responsibilities, and authority.
3. Tools to support the SQA activities are made available.

Examples of support tools include:
- database programs,
- spreadsheet programs, and
- auditing tools.

Ability 3 **Members of the SQA group are trained to perform their SQA activities.**

Examples of training include:
- roles and responsibilities of the service delivery group;
- standards, procedures, and methods for the services delivered;
- application domain of the service;
- SQA objectives, procedures, and methods;
- involvement of the SQA group in the service activities;
- effective use of SQA methods and tools; and
- interpersonal communications.

Ability 4 **The members of the service delivery group receive orientation on the role, responsibilities, authority, and value of the SQA group.**

Activities Performed

Activity 1 **A SQA plan is prepared for the service delivery according to a documented procedure.**

This procedure typically specifies that:

1. The SQA plan is developed in the early stages of, and in parallel with, the overall service delivery planning.
2. The SQA plan is reviewed by the affected groups and individuals.

   Examples of affected groups and individuals include:
   - the service delivery manager;
   - other service delivery managers;
   - the service manager;
   - customer SQA representative;
   - the senior manager to whom the SQA group reports noncompliance issues; and
   - the service delivery group (including all subgroups, such as the event management group as well as the service task leaders).
3. The SQA plan is managed and controlled.

Activity 2 **The SQA group's activities are performed in accordance with the SQA plan.**

The plan covers:

1. Responsibilities and authority of the SQA group.
2. Resources requirements for the SQA group (including staff, tools, and facilities).
3. Schedule and funding of the service's SQA group activities.
4. The SQA group's participation in establishing the service delivery plan, standards, and procedures for the service delivery.
5. Evaluations to be performed by the SQA group.

   Examples of activities and products to be evaluated include:
   - event management activities,
   - event management library,
   - configuration management activities, and
   - configuration baseline.
6. Audits and reviews to be conducted by the SQA group.
7. Standards and procedures to be used as the basis for the SQA group's reviews and audits.
8. Procedures for documenting and tracking noncompliance issues to closure.

   These procedures may be included as part of the plan or may be included via reference to other documents where they are contained.
9. Documentation that the SQA group is required to produce.

10. Method and frequency of providing feedback to the service delivery group and other service-related groups on SQA activities.

Activity 3 **The SQA group participates in the preparation and review of the service commitments and service delivery planning, standards and procedures.**

1. The SQA group provides consultation and review of the plans, standards, and procedures with regard to:
   - compliance to organizational policy,
   - compliance to externally imposed standards and requirements (e.g., standards required by the customer),
   - standards that are appropriate for the service delivery,
   - topics that should be addressed in the service delivery plan, and
   - other areas as assigned by the service manager.
2. The SQA group verifies that plans, standards, and procedures are in place and can be used to review and audit the service delivery.

Activity 4 **The SQA group audits the service delivery activities to verify compliance.**

1. The activities are evaluated against the service delivery plan and the designated service standards and procedures.

   > Refer to the Verifying Implementation common feature in the other key process areas for practices covering the specific reviews and audits performed by the SQA group.

2. Deviations are identified, documented, and tracked to closure.
3. Corrections are verified.

Activity 5 **The SQA group periodically reports the results of its activities to the service delivery group.**

Activity 6 **Deviations identified in the service activities and delivered service are documented and handled according to a documented procedure.**

This procedure typically specifies that:

1. Deviations from the service delivery plan and the designated service standards and procedures are documented and resolved with the appropriate service task leaders, service delivery managers, or service managers, where possible.
2. Deviations from the service delivery plan and the designated service standards and procedures not resolvable with the service task leaders, service delivery managers, or service manager are documented and presented to the senior manager designated to receive noncompliance items.
3. Noncompliance items presented to the senior manager are periodically reviewed until they are resolved.
4. The documentation of noncompliance items is managed and controlled.

Activity 7 **The SQA group conducts periodic reviews of its activities and findings with the customer's SQA personnel, as appropriate.**

Measurement and Analysis

Measurement 1 **Measurements are made and used to determine the cost and schedule status of the SQA activities.**

> Examples of measurements include:
>
> - completions of milestones for the SQA activities compared to the plan,
> - work completed, effort expended, and funds expended in the SQA activities compared to the plan, and
> - number of activity reviews compared to the plan.

Verifying Implementation

Verification 1 **The SQA activities are reviewed with senior management on a periodic basis.**

> Refer to Verification 1 of the Service Tracking and Oversight key process area for practices covering the typical content of senior management oversight reviews.

Verification 2 **The SQA activities are reviewed with the service manager on both a periodic and event-driven basis.**

> Refer to Verification 2 of the Service Tracking and Oversight key process area for practices covering the typical content of management oversight reviews.

Verification 3 **Experts independent of the SQA group periodically review the activities and work products of the SQA group.**

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Part III

Appendices

Appendix A

Change history

Version `1.0` has been released after level two of the model was considered to be complete and ready for use by the IT Service CMM Review Board. Preliminary versions were numbered `0.1, 0.2, 0.3`, etc. The minor number was increased after each review by the review board. Dates are used to distinguish intermediate releases.

Change history:

`0.0-980416`	Added common features of Event Management, section 5.6.
`0.0-980506`	Added common features of Subcontract Management, section 5.4. Rewrite of section on design decisions, section 2.5.
`0.0-980519`	Added appendix B which compares ITIL with the IT Service CMM, not yet finished. Added common features of Service Quality Assurance, section 5.7. Changes with respect to the last release are marked with a gray bar in the margin.
`0.0-980804`	Some more text on the differences between ITILand the ITS-CMM in appendix B. Split the document in two parts. Described Service Planning and Evaluation into much more detail.
`0.1-981014`	Added explanation of the common features, see page 12. Explained the more detailed key practice descriptions of the IT Service CMM as compared to the Software CMM, see section 2.5.2. Adjusted the activities of the Service Planning and Evaluation key process area. Described Configuration Management into much more detail, see section 5.5.
`0.1-981207`	Comments of Gerrit Matser processed.
`0.2-981210`	Adapted Configuration Management to comments of review board, see section 5.5. Described Event Management into more detail, see section 5.6.
`0.4-990118`	Added overview to Event Management, see section 5.6.
`0.5-990208`	Described Service Tracking and Oversight in more detail, see section 5.3.
`0.6-990301`	Split Service Planning and Evaluation into Service Commitment Management and Service Delivery Planning, see sections 5.1 and 5.2. Adapted Service Tracking and Oversight to comments of review board, see section 5.3. Adapted Event Management to comments of review board, see section 5.6. Described Service Quality Assurance into more detail, see section 5.7.

0.7-990325	Described Subcontract Management into more detail, see section 5.4.
0.8-990416	Adapted Subcontract Management to comments review board, see section 5.4. More extensive index. New chapter (3) on the intepretation of the IT Service CMM. Small overview sections at start of each key process area in part II.
1.0	Layout and other small changes.

Appendix B

The IT Service CMM and ITIL compared

In this appendix we compare the IT Service CMM with the IT Infrastructure Library. Section B.1 presents a short overview of the library, and in section B.2 we look at the main differences between ITILand IT Service CMM.

B.1 IT Infrastructure Library

According to [4], the primary objective of the *IT Infrastructure Library* is 'to establish best practices and a standard of IT service quality that customers should demand and providers should seek to supply.' ITIL was originally developed by the British government through their Central Computer & Telecommunications Agency (CCTA). Nowadays, ITIL is being maintained by the Netherlands IT Examinations Institute (EXIN).

The library consists of several sets of booklets that contain those 'best practices' in IT service delivery. The booklets are divided into nine sets. The first six sets are called the IT service provision and IT infrastructure management sets. The other three are called the Environmental sets. These latter three sets cover the environmental infrastructure for IT, such as the building, cabling and service facilities. We will only look at the IT service provision and IT infrastructure management sets. The six sets cover the following practices (each described in a separate booklet):

- The Service Support set covers configuration management, problem management, change management, help desk, and software control and distribution.
- The Service Delivery set covers service level management, capacity management, contingency planning, availability management, and cost management for IT services.
- The Managers' set deals with managing facilities management and customer liaison.
- The Software Support set describes software life-cycle support and testing an IT service for operational use.
- The Computer Operations set covers computer operations management, unattended operating, third party and single source maintenance, and computer installation and acceptance.
- Finally, the Network set describes the management of local processors and terminals.

Each booklet describes the practices in terms of planning; implementation; audits; benefits, cost and possible problems, and tool support. Attention is given to operational procedures, roles, responsibilities, dependencies, support processes, training, etc.

B.2 ITIL versus the IT Service CMM

The main difference between the IT Service CMM and ITIL is that the IT Service CMM is an improvement-oriented framework, whereas ITIL is a set of best practices. ITIL does not provide processes targeted at process improvement, the IT Service CMM does. Part of the IT Service CMM are processes that are especially targeted at the improvement of service delivery processes, such as Organization Process Definition and Process Change Management. While ITIL gives 'best practices' for different service processes, it does not provide the facilities to improve those processes.

A second difference concerns the distinction between processes that result in services being delivered to the customer and services that support those service delivery processes. The IT Service CMM distinguishes between management, enabling and delivery processes. ITIL has a similar distinction between service support and service delivery processes, but the two are not compatible.

ITIL processes	IT Service CMM key process areas
Helpdesk	Event Management and *Service*
Problem Management	Event Management Problem Prevention
Change Management Configuration Management Software Control and Distribution	Configuration Management
Service Level Management	Service Commitment Management Service Delivery Planning Service Tracking and Oversight Service Quality Assurance
Capacity Management Availability Management	Service Delivery Planning Integrated Service Management Quantitative Process Management
Contingency Planning	*Service*
Cost Management	Quantitative Process Management

Table B.1: From ITIL to IT Service CMM

Table B.1 shows the relationships between the ITIL processes and the IT Service CMM key process areas. The top half of the table shows the five ITIL processes from the Service Support set, the bottom half shows the Service Delivery set.

As mentioned above, there is no clear one-on-one relation between the ITIL processes and the IT Service CMM key process areas. Activities from several ITIL processes are covered by multiple IT Service CMM processes and vice versa.

The activities from the ITIL process Helpdesk are partly covered by the key process area Event Management, and are partly considered to be service delivery activities. Supporting the customer can be considered an IT service, and hence it is not part of the IT Service CMM key process areas.

The ITIL process Problem Management is covered by two IT Service CMM key process areas. Event Management takes care of resolving incidents and problems. The level five key process area Problem Prevention is responsible for changing the process in such a way that specific problems do not recur. Here, the assumption of the IT Service CMM is that an IT service organization can only really prevent problems if it has reached level four on the service maturity scale, hence this key process area

is positioned on level five.

The three ITIL processes Configuration Management, Change Management, and Software Control & Distribution, are all covered by one IT Service CMM key process area, Configuration Management. This key process area covers the complete management of IT components, i.e. identification of relevant components, version management, change management, etc.

The activities from the ITIL processes Capacity Management and Availability Management are covered by three IT Service CMM key process areas: Service Delivery Planning on level two plans the capacity needed and availability for one service. Integrated Service Management plans the capacity needed and availability for multiple services delivered together. Quantitative Process Management is responsible for the organization wide planning and management of capacity needed and availability.

The ITIL process Contingency Planning is considered to be a service, or an aspect of service delivery. Customers can buy services with added contingency or without. In the latter case, the service level agreement will exclude certain circumstances from the responsibility of the service provider, such as natural disasters, power failures, etc.

Finally, the activities from the ITIL process Cost Management are covered by the key process area Quantitative Process Management. On level four, the service provider has enough quantitative information to be able to implement proper cost management.

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