

Saimaa University of Applied Sciences
Faculty of Technology, Lappeenranta
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MAINTENANCE OF CONFIGURATION MANAGEMENT SYSTEM

Bachelor's Thesis 2011

ABSTRACT

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Maintenance of Configuration Management System, 34 pages,

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The objective of this thesis is to find way of ideal maintenance of Configuration Management System (CMS) to be able to work without unplanned breaks. This system is based on the Information Technology Infrastructure Library (ITIL) recommendations, where is described the many processes needed for provision of IT services. CMS is recording the state of IT in organizations and as such is just the tool needed to follow processes defined in ITIL. To be able recognize maintenance processes requires going through ITIL version 3 publications.

This thesis was done on the basis of information gathered from many sources including specialist interviews and the internet. The result revealed the need for a definition of roles for responsibilities, and was followed by tasks to keep systems up to date with actual and needed information. The conclusion included a definition of roles, responsibilities and tasks related to specific parts of CMS and should be studied first from provider's manual.

Keywords: Configuration Management System, maintenance, Information Technology Infrastructure Library, Information Technology Service Management, Configuration Management Database

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TERMINOLOGY

Change	The addition, modification or removal of anything that could have an effect on IT services.
Change management	The process responsible for controlling the lifecycle of all changes.
CI	Configuration item is any component that needs to be managed in order to deliver IT service.
CMDB	A configuration management database is a repository of information related to all components of IT infrastructure.
CMS	A set of tools and databases that are used to manage an IT service provider's configuration data.
Event	Significant change of state for management of CI or IT service.
Event management	Process responsible for events through their lifecycle.
Incident	An unplanned interruption of IT service or reduction of its quality.
Incident management	The process responsible for incidents through their lifecycle.
IT	Information technology is type of technology for the storage, communication or processing information.
ITIL	Information Technology Infrastructure Library is set of best practice guidance for ITSM.
ITSM	The implementation and management of quality IT services within production and business needs.
Problem	An unplanned interruption or reduction quality of IT service, where cause is not known.
Problem management	The process managing lifecycle of all problems.

1 INTRODUCTION

This Bachelor Thesis will describe tasks and steps needed to keep a Configuration Management System (CMS) functioning and performing as was its purpose. The first step is to familiarise the reader with an understanding of CMS functions, processes and roles. As a result, we should be able to recognize the needed knowledge for definition of maintenance tasks. The second step is the process of developing ideas, which lead to specifications of maintenance tasks. And the last view will be to go through maintenance tasks needed to keep data, roles, functions and connected processes in good shape. These steps should satisfy the Tieto Corporation (Tieto), which is here in the customer role. Specified objectives were given by Tieto representatives.

Tieto

According to information from the official Tieto internet presentation, the history of Tieto Corporation began in Espoo, Finland, in 1968 when it provided services for the Union Bank of Finland. Since that time, Tieto has been a developing company, which was changing its name and organizational structures all the time. Today, Tieto is a big organization with 18 000 workers around the world, but still, Tieto has main aim to be a leading IT company. This result is met in Northern Europe, where the company has a main office in Helsinki and many branches around Finland.

Tieto has also offices in the Czech Republic, and the biggest one is in Ostrava. There is the VSB-Technical University of Ostrava, which is writer's home university. The Tieto office in Ostrava is the place where the author gained first work experience with the Tieto environment, which was able to partly be used for practice training. This experience was based on work in the area of mass distribution of applications and patches to customer's environments and maintenance related systems.

The Tieto office in Lappeenranta has provided organization's with computer default software and place with network as tools for working practice.

2 ESSENTIAL CONCEPTS

2.1 ITIL

ITIL is the set of best practices and concepts for IT service management (ITSM), IT development and IT operations. According to publication OGC 2007a, ITSM means thinking of IT as a cohesive set of business resources and capabilities.

One business case could be, for example, usage of IT asset management as a process to improve resource utilization, which is way of saving costs. Another example might be licence management. Here, companies and organizations can save money when they monitor software licenses and their usage. The result of this process is found in table, where these are values of application utilization. These results give good knowledge as a basis for deciding to buy new licences or uninstall applications where there is no utilization, and use it on computers where it is needed. (OGC 2007a, p. 190)

All ITIL benefits are given by guidance on the provision of quality IT services based on perfect settings of processes and facilities. As such, ITIL is the only public framework, where the ITIL mark is owned by the Office of Government Commerce, which is part of the Government of the United Kingdom.

Core ITIL version 3 collection is in following books:

- Service Strategy (OGC 2007a)
- Service Design (OGC 2007b)
- Service Transition (OGC 2007c)
- Service Operation (OGC 2007d)
- Continual Service Improvement (OGC 2007e)

These publications are the body of the ITIL framework and work as a source of good practice in service management. ITIL is used worldwide by different kinds of organizations and it serves for the establishment and improvement of capabilities in service management. Organizations are improving usage of ITIL recommendations by implementing the standard, ISO/IEC 20000, which is then audited and certified. Although ISO/IEC 20000 is a standard, so ITIL serves as a body of knowledge useful for its achievement. (Cartlige, A. et al. 2007, p. 7)

Base building part is a process, which serves to describe steps needed for requested outcome. The IT process has income in the form of people, technology and data. The efficiency of the process is given by good settings of timing, dependencies and constraints. Based on my experiences and opinion, improvement of the process should be done whenever it is visible, that change brings positive results in efficiency or quality without lost efficiency. (OGC 2007a, p. 23)

Table 1 shows ITIL processes and relations with ITIL publications:

Service Management Process	Primary Source	Further Expansion
7-Step Improvement Process	CSI	
Access Management	SO	
Availability Management	SD	CSI
Capacity Management	SD	SO, CSI
Change Management	ST	
Demand Management	SS	SD
Evaluation	ST	
Event Management	SO	
Financial Management	SS	
Incident Management	SO	CSI
Information Security Management	SD	SO
IT Service Continuity Management	SD	CSI
Knowledge Management	ST	CSI
Problem Management	SO	CSI
Release and Deployment Management	ST	SO
Request Fulfillment	SO	
Service Asset and Configuration Mgmt	ST	SO
Service Catalogue Management	SD	SS
Service Level Management	SD	CSI
Service Measurement	CSI	
Service Portfolio Management	SS	SD

Service Reporting	CSI	
Service Validation and Testing	ST	
Strategy Generation	SS	
Supplier Management	SD	
Transition Planning and Support	ST	

Table 1 Processes and ITIL publication relation (Cartlige, A. et al. 2007, p. 41)

SS - Service Strategy (OGC 2007a)

SD - Service Design (OGC 2007b)

ST - Service Transition (OGC 2007c)

SO - Service Operation (OGC 2007d)

CSI - Continual Service Improvement (OGC 2007e)

2.2 Service Management

Based on the publication by Cartlige, A. et al. 2007, a service is a means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks. A task of Service Management is to fulfil these objectives by setting owners, roles, functions and processes needed for specific customer service. (Cartlige, A. et al. 2007, p. 6)

“Service Management is a set of specialized organizational capabilities for providing value to customers in the form of services.” (OGC 2007a, p. 31)

The ideal result of Service Management is a working service with satisfied customers and efficiency of service, which is generating provider’s profit. For example, in Service Management could be described web services provided by company A. Company B has a business focused on selling products and company A is selling web services, which are cheaper to buy by company B than to have their own hardware, software and people needed to develop, implement and maintain web services. Satisfied customers with web service of company B are the result satisfaction of company B, and it means the perfect result for company A, if company A was able to generate profit with the provided web services. Resources and capabilities are inputs to service management that represent the assets of the service provider. The outputs are the services that provide value to the customers. A strategic asset of the service provider is

effective service management providing the ability to carry out core business of providing services, which is delivering values to customers by facilitating customer outcomes.

Incorporating good practices can bring the ability to create an effective service management system for a service provider. Definition of good practice might be doing things that have been shown to work and to be effective. As such, public frameworks can be mentioned, such as ITIL, COBIT and CMM. These can be defined in standards like ISO/IEC 20000 and ISO 9000. (OGC 2007a, p. 31; Cartlige, A. et al. 2007, p. 6)

2.3 Service strategy

Service Strategy is the name of the first book from the ITIL set. The service strategy is planning of service. Strategies represent the actions to be taken to accomplish expected results. Clear definition of objectives is a good base for consistent decision making and minimizing later conflicts. Within strategies are set forth priorities and serve as standards. (Cartlige, A. et al. 2007, p. 12)

Strategy starts with perspective where is defined vision and direction of service. Then there is needed to know positions and actual situation on market and inside organization. On the basis of defined perspective and positions, plans can be created. According to plans you can define patterns. Figure 1 shows all parts of strategy. (Cartlige, A. et al. 2007, p. 13)

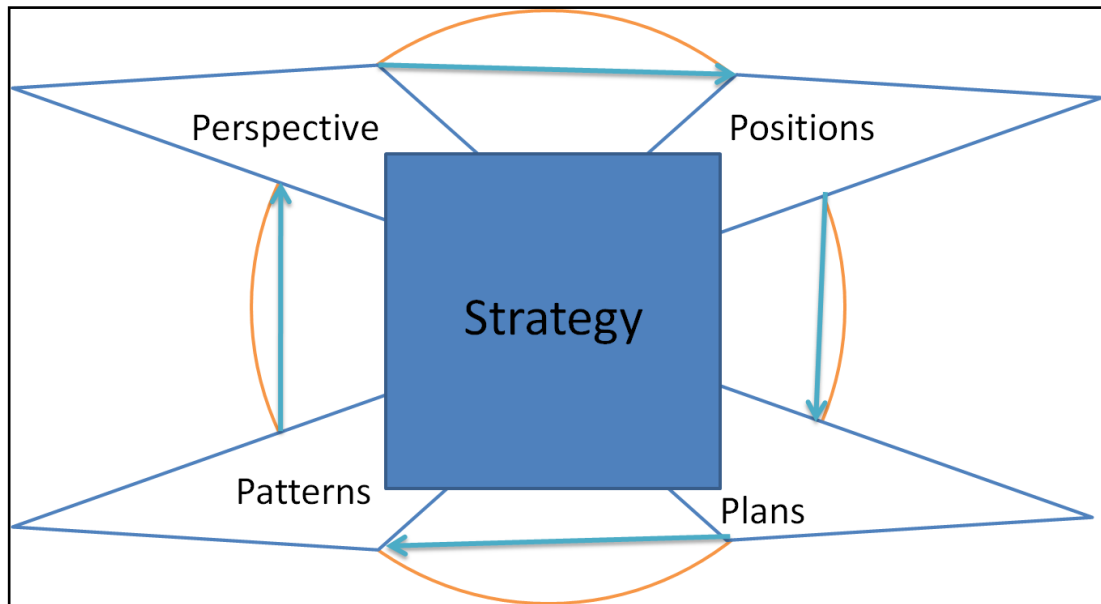


Figure 1 Schema of strategy (OGC 2007a)

Who are existing or potential customers and what are their needs are the starting questions for definition of service strategy. On the other hand, the service provider should understand current and potential market places. A service strategy should be aligned with the organizational culture. The result of service strategy must provide sufficient value to the customers and provider's stakeholders.

The Service Strategy publication is the core of the ITIL V3 lifecycle, so it sets out guidance for all IT service providers and their customers.

Answers to the following questions from Cartlige, A. et al. 2007 will help to create a service strategy:

- *“What services should be offered?”*
- *Who the services should be offered to?*
- *How the internal and external market places for their services should be developed the existing and potential competition in these marketplaces, and the objectives that will differentiate the value of what you do or how you do it?*
- *How the customer(s) and stakeholders will perceive and measure value, and how this value will be created?*
- *How customers will make service sourcing decisions with respect to use of different types of service providers?*

- *How visibility and control over value creation will be achieved through financial management?*
- *How robust business cases will be created to secure strategic investment in service assets and service management capabilities?*
- *How the allocation of available resources will be tuned to optimal effect across the portfolio of services?*
- *How service performance will be measured?” (Cartlige, A. et al. 2007, p. 12)*

By definition, critical success factors (CSFs) identify and measure the results desired by service strategy. Service oriented accounting by usage of financial management can understand services in terms of consumption and profit.

Risk Management is mapping and managing the portfolio of risks underlying a service portfolio. (Cartlige, A. et al. 2007, p. 14)

Strategic roles:

- *“Business Relationship Manager (BRM): BRMs establish a strong business relationship with the customer by understanding the customer's business and their customer outcomes. BRMs work closely with the Product Managers to negotiate productive capacity on behalf of customers.*
- *Product Manager (PM): PMs take responsibility for developing and managing services across the life-cycle, and have responsibilities for productive capacity, service pipeline, and the services, solutions and packages that are presented in the service catalogues.*
- *Chief Sourcing Officer (CSO): the CSO is the champion of the sourcing strategy within the organization, responsible for leading and directing the sourcing office and development of the sourcing strategy in close conjunction with the CIO.” (Cartlige, A. et al. 2007, p. 17)*

Information written in the Service Strategy publication is expected to be used in IT organizations to help them in developing capabilities in service management as is seen in Figure 2. By defining strategic objectives is set direction for growth of prioritizing investments and defining outcomes. On picture Figure 2 is visible, that Service Strategy is base for further providing services.

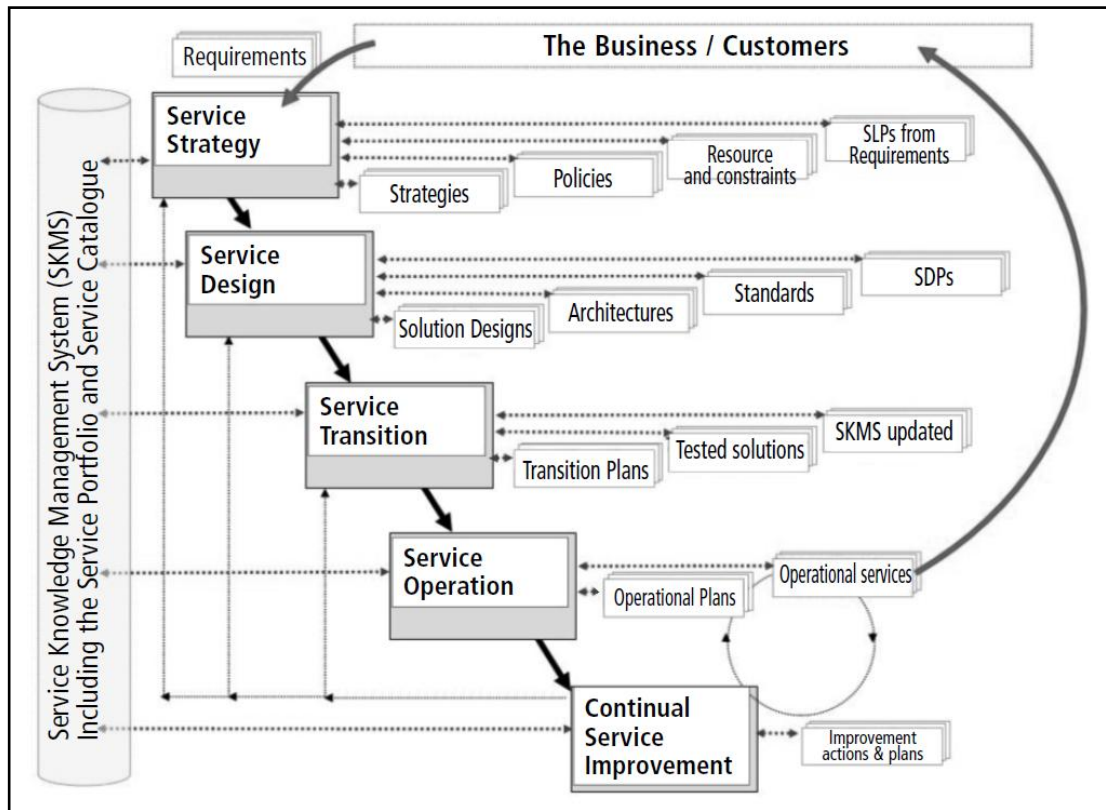


Figure 2 Service lifecycle (Cartlige, A. et al. 2007, p.11.)

2.4 Service design

The objectives of Service Design are design architectures, processes, policies and documentation of appropriate and efficient IT services to meet current and future agreed business requirements. (OGC 2007b, p. 25)

The main goals and objectives defined by Cartlige, A. et al. 2007:

- *“Design services to meet agreed business outcomes.*
- *Design processes to support the service lifecycle.*
- *Identify and manage risks.*
- *Design secure and resilient IT infrastructures, environments, applications and data/information resources and capability.*
- *Design measurement methods and metrics.*
- *Produce and maintain plans, processes, policies, standards, architectures, frameworks and documents to support the design of quality IT solutions.*

- *Develop skills and capability within IT.*
- *Contribute to the overall improvement in IT service quality.” (Cartlige, A. et al. 2007, p. 18)*

Basic assumption for development of a service solution is knowledge of business requirements and outcomes, which should be documented. Service goes to the production like a Service Design Package (SDP) through Service Transition. (Cartlige, A. et al. 2007, p. 18)

Service Design Package (SDP) is definition of service in all aspects of an IT service and its requirements through each stage of its lifecycle. (Cartlige, A. et al. 2007, p. 19)

Service Catalogue Management (SCM)

Objectives of SCM are to collect all information about provided services into one place. Then all business areas can see needed information and settings from all services. The service Portfolio is the main source of SCM. (Cartlige, A. et al. 2007, p. 19)

2.5 Service Transition

Service Transition brings services defined by SDP to operational use. During the implementation process it takes care of normal service usage, but in critical states it also tests to be sure that service is able to recover to the normal state. (Cartlige, A. et al. 2007, p. 24; OGC 2007c, p. 16)

Change Management

Change Management is for managing all changes with standardized methods which have to be recorded, evaluated, authorized, prioritized, planned, tested, implemented, documented and reviewed in a controlled manner by the CMS. (Cartlige, A. et al. 2007, p. 25; OGC 2007a, p. 345)

Figure 4 shows types of changes and their structures.

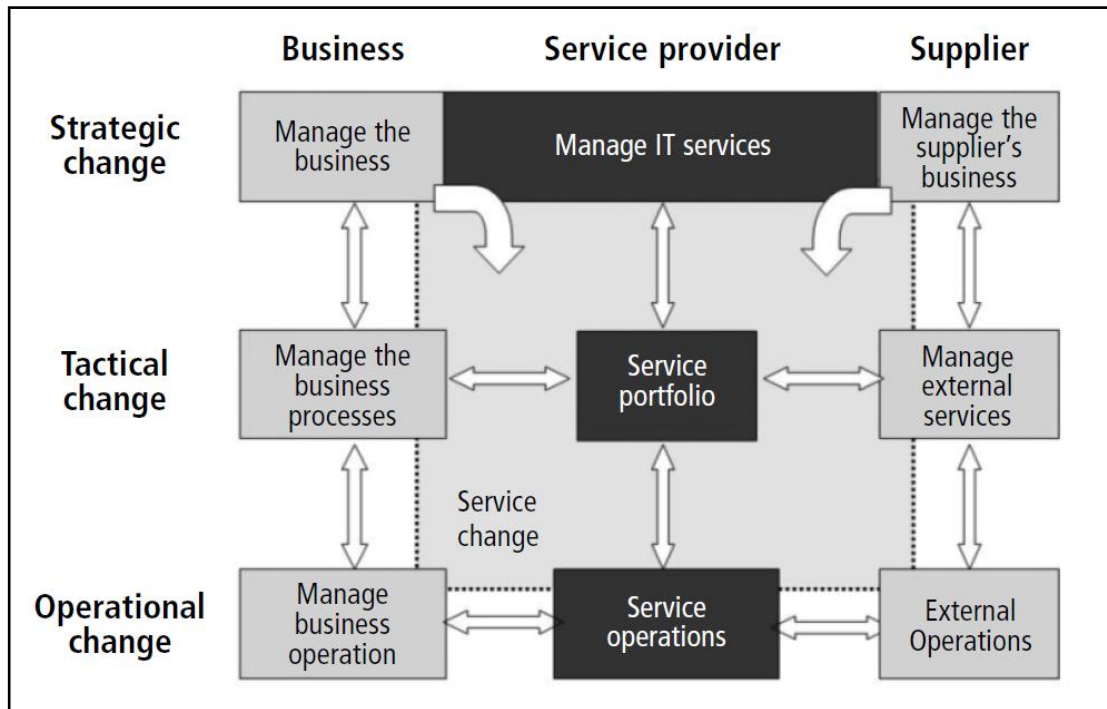


Figure 3 Scope of change management (Cartlige, A. et al. 2007, p. 26)

2.6 Service Operation

Delivering agreed upon levels of service to users and customers is the main aim of Service Operation, which is done by use applications, technology and infrastructure. Only during the Service Operation stage of service is value delivered to the business. (Cartlige, A. et al. 2007, p. 29; OGC 2007d, p. 26)

Event Management

Definition of event, according ITIL, is a change of state that has significance for the management of a configuration item or IT service. The objective of Event Management is to monitor these events. (Cartlige, A. et al. 2007, p. 29; OGC 2007d, p. 65)

“Event Management is the process that monitors all events that occur through the IT Infrastructure to allow for normal operation and also to detect and escalate exception conditions.” (OGC 2007d, p. 65)

Triggers are used to generate such events, whenever a value is out of the defined levels. The generated event then may lead to creation of an incident, problem or change. (Cartlige, A. et al. 2007, p. 29; OGC 2007d, p. 65)

Incident Management

Based on the ITIL definition, an incident is an unplanned interruption to an IT service, or a reduction in the quality of an IT service.

The objective of this process is to restore service to the normal state as quickly as possible. The service desk and event management are places where incidents are created. (OGC 2007d, p. 35)

Request Fulfillment

The objective of this process is to enable users to request and receive standard services, to source and deliver these services, to provide information to users and customers about services and procedures for obtaining them, and to assist with general information, complaints and comments.

“A service request is a request from a user for information or advice, or for a standard change, or for access to an IT service.” (Cartlige, A. et al. 2007, p. 30)

Access Management

The Access Management process is about providing the rights for users to be able to access a service or group of services. The purpose of Access Management is to help to manage confidentiality, availability and integrity of data and intellectual property. (Cartlige, A. et al. 2007, p. 31; OGC 2007d, p. 66)

“Access Management helps to manage confidentiality, availability and integrity of data and intellectual property.” (Cartlige, A. et al. 2007, p. 31)

Problem Management

The origin of the problem is an incident, where the root cause of the incident is not known, and problem management is a process of how to deal with further investigation.

Problem Management is trying to prevent problems and resulting incidents from happening. The next objectives are elimination of recurring incidents and minimization of incident impact that cannot be prevented. (OGC 2007d, p. 35; Cartlige, A. et al. 2007, p. 31)

2.7 Continual Service Improvement

Continual Service Improvement is, in ITIL to take care about the working

structure of services and related ITIL processes such as incident management, change management and problem management. There should be taken note of customer feedback and optimizing of service according to customer wishes whenever it is needed. (OGC 2007e)

Figure 4 shows an example of a service model in organization with relation on specific stage.

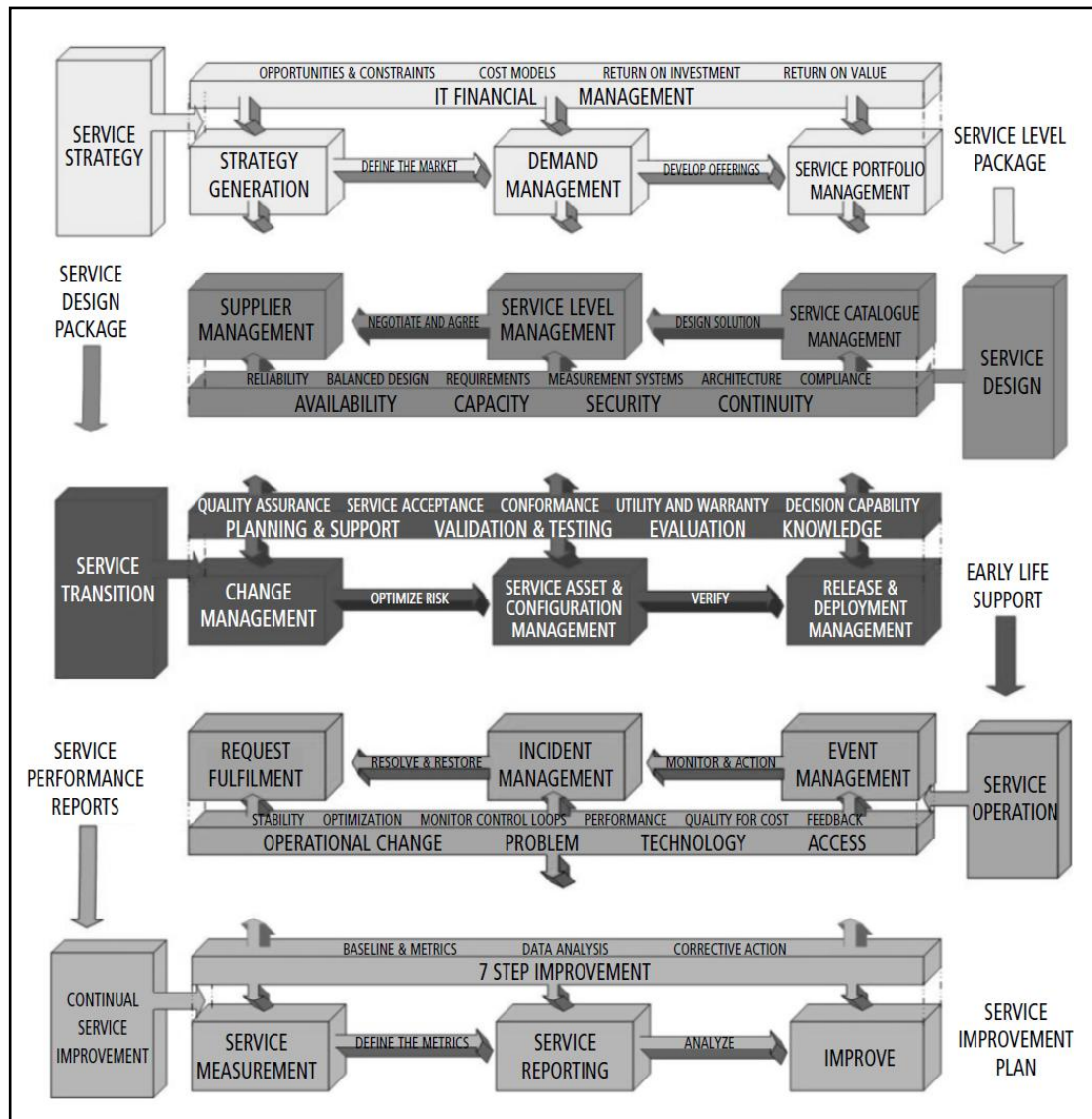


Figure 4 High level view of service model (Cartlige, A. et al. 2007, p. 50)

2.8 Configuration Management System (CMS)

The Configuration Management System (CMS) records the state of IT in an organization. Implementation of this system is recommended by ITIL.

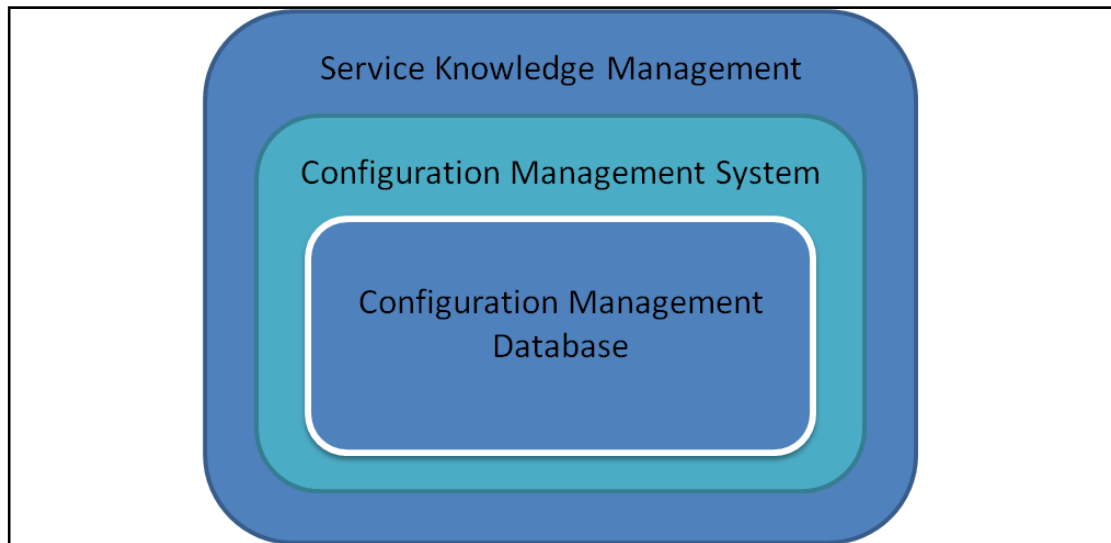


Figure 5 CMS connections (OGC 2007c)

CMS grew on the CMDB basis. CMS is a place where all data and resources are federated. Federation can contain several CMDBs, and for data integrity we need all data gathered put through the reconciliation process. The reason for the reconciliation process can be in data duplicity, because data are scattered across repositories that are mostly poorly integrated. (OGC 2007c, p. 194)

“Mapping of customer outcomes to services and service assets can be accomplished as part of a Configuration Management (CMS).” (OGC 2007a, p. 106)

Main task for CMS include identifications of CIs, data control, status maintenance and verification.

Based on the ITIL definition, CMS is a set of tools and databases that are used to manage an IT service provider’s configuration data. The CMS also includes information about incidents, problems, known errors, changes and releases, and may contain data about employees, suppliers, locations, business units, customers and users. (OGC 2007a, p.347)

Figure 6 shows example of CMS schema:

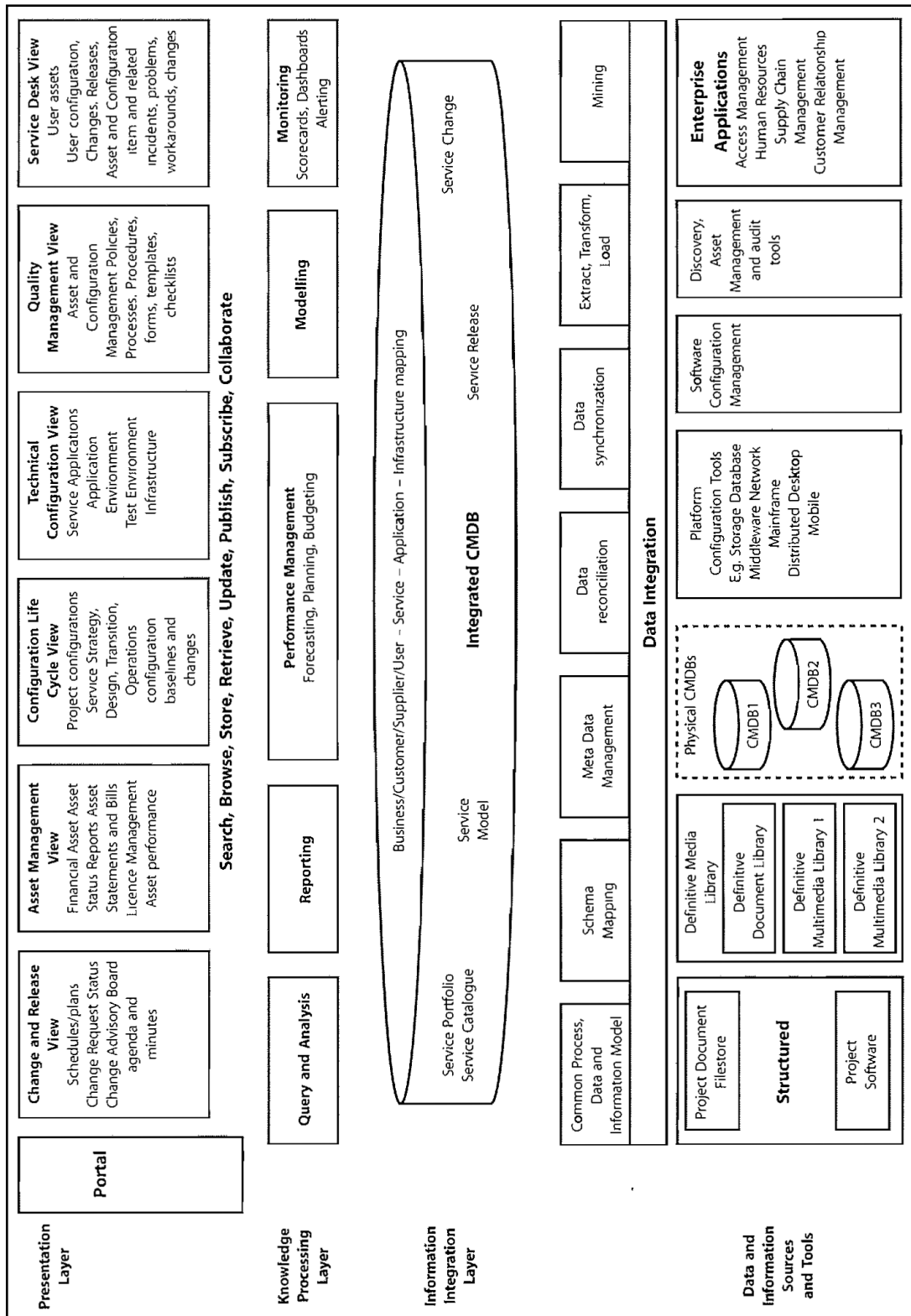


Figure 6 Example of CMS (OGC 2007c, p. 68)

Configuration Management Database (CMDB)

CMDB stands for Configuration Management Database and it is a part of ITIL. According to ITIL the definition, CMDB is a database that tracks and records configuration items associated with IT infrastructure and the relationships between them. (Rudd, C. 2004, p. 18)

The reasons and advantages in the usage of CMDB are for instance, access to the infrastructure with full service information. Faster and accurate incident resolution and logging was done by recording of various data from the service catalog, financial data, service levels and contract records. (Rudd, C. 2004, p. 16)

Discovery tools

Discovery bring to CMS the needed automation, because previously, asset management was done only by hand. This means, that every computer was recorded to the CMDB by a person. This was time consuming and not all people followed the process properly.

The discovery tools scan the organization's environment according to settings and brings the results to CMS where they are further processed. The start of these tools was in the form of installed client on servers or computers, which was sending information about a specific machine. Today, new technologies are able to scan packets, and according to the results, define service running in the environment. This is possible only with proper implementation and setting with the most known applications like SAP, database services, web services and others. (OGC 2007d, p. 282)

Benefits from discovery tools according to BMC Discovery Solution:

- *“Automatically update the CMDB to reflect change in your environment, including configuration drift, as it happens.*
- *Reduce costs by accurately and automatically tracking hardware and software license inventory.*
- *Improve system stability by visualizing the relationships among discovered assets, including their relationship to business services.*
- *Drive consistent decisions by ensuring that all appropriate employees have access to the same, updated information.*

- *Improve service levels by applying business process and service contexts to applications and infrastructure.*
- *Minimize risk by understanding the impact of events on IT and business services before implementing changes.*
- *Increase availability by speeding problem resolution, improving change execution, and prioritizing actions based on complete information.” (BMC 2009)*

2.9 ITIL defined roles related to CMS

ITIL described several roles and their responsibilities. Table 2 shows some examples related with CMS:

Role	Responsibility
The service asset manager	Works to the overall objectives agreed with the IT service manager; implements the organization’s service Asset Management policy and standards.
	Evaluates existing Asset Management systems and the design, implementation and management of new/improved systems for efficiency and effectiveness, including estimating and planning the work and resources involved, and monitoring and reporting on progress against plan.
	Agrees scope of the Asset Management processes, function, the items that are to be controlled, and the information that is to be recorded; develops Asset Management standards, Asset Management plans and procedures.
	Mounts an awareness campaign to win support for new Asset Management procedures; ensures that changes to the Asset Management methods and processes are properly approved and communicated to staff before being implemented; plans, publicizes and oversees implementation of new Asset Management systems.
	Arranges recruitment and training of staff.
	Manages the evaluation of proprietary Asset Management tools and recommends those that best meet the organization’s budget, resource, timescale and technical requirements.
	Manages the Asset Management plan, principles and processes and their implementation.
	Agrees assets to be uniquely identified with naming conventions; ensures that staff comply with identification standards for object types, environments, processes, lifecycles, documentation, versions, formats, baselines, releases and templates.
	Proposes and/or agrees interfaces with Change Management, problem management, computer operations, logistics, finance and administration functions.

	Plans population of the asset DB; manages the asset DB, central libraries and tools; ensures regular housekeeping of the asset DB.
	Provides reports, including management reports (indicating suggested action to deal with current or foreseen shortcomings), impact analysis reports and initiates actions needed to secure funds to enhance the infrastructure and staffing levels in order to cope with growth and change.
	Assists auditors to audit the activities of the Asset Management team for compliance with laid-down procedures; ensures corrective action is carried out.
The configuration manager	Works to the overall objectives agreed with the IT services manager; implements the organization's Configuration Management policy and standards
	Evaluates existing Configuration Management Systems and the design, implementation and management of new/improved systems for efficiency and effectiveness, including estimating and planning the work and resources involved, and monitoring and reporting on progress against plan.
	Agrees scope of the Configuration Management processes, function, the items that are to be controlled, and the information that is to be recorded; develops Configuration Management standards, Configuration Management Plans and procedures.
	Mounts an awareness campaign to win support for new Configuration Management methods and processes are properly approved and communicated to staff before being implemented; plans ,publicizes an oversees implementation of new Configuration Management Systems.
	Arranges recruitment and training of staff.
	Manages the evaluation of proprietary Configuration Management tools and recommends those that best meet the organization's budget, resource, timescale and technical requirements.
	Manages the Configuration Management Plan, principles and processes and their implementation.
	Agrees CIs to be uniquely identified with naming conventions; ensures that staff comply with identification standards for object types, environments, processes, lifecycles, documentation, versions, formats, baselines, releases and templates.
	Proposes and/or agrees interfaces with Change Management, problem management, network management, release management, computer operations, logistics, finance and administration functions.
	Plans population of the CMS; manages CMS, central libraries, tools, common codes and data; ensures regular housekeeping of the CMS.
	Provides reports, including management reports (indicating suggested action to deal with current or foreseen shortcomings), impact analysis reports and configuration status reports.

	Initiates actions needed to secure funds to enhance the infrastructure and staffing levels in order to cope with growth and change.
	Assists auditors to audit the activities of the Configuration Management team for compliance with laid-down procedures; ensures corrective action is carried out.
The configuration analyst	Proposes scope of the Asset and Configuration Management processes, function, the items that are to be controlled, and the information that is to be recorded; develops Asset and Configuration Management standards, plans and procedures.
	Trains Asset and Configuration Management specialists and other staff in Asset and Configuration Management principles, processes and procedures.
	Supports the creation of the Asset and Configuration Management Plans and principles and their implementation.
	Creates Asset and Configuration Management processes and procedures, which included CI registration procedures; access controls and privileges; ensures that the correct roles and responsibilities are defined in the Asset and Configuration Management Plans and procedures.
	Proposes and agrees with the asset and configuration manager CIs to be uniquely identified with naming conventions; ensures that developers and configuration system users comply with identification standards for object types, environments, processes, lifecycles, documentation, versions, formats, baselines, releases and templates.
	Liaises with the configuration administrator/librarian on population of the asset and CMS; manages asset and CMS, central libraries, common codes and data; ensures regular housekeeping of the asset and CMS
	Uses or provides the asset and CMS to facilitate impact assessment for RFCs and to ensure that implemented changes are as authorized; creates change records, configuration baselines, and package release records in order to specify the effect on CIs of an authorized change; ensures any changes to change authorization records are themselves subject to Change Management procedures; ensures that the asset and CMS is updated when a change is implemented.
	Uses the assets and CMS to help identify other CIs affected by a fault that is affecting a CI.
	Performs configuration audits to check that the physical IT inventory is consistent with the asset and CMS and initiates any necessary corrective action.
	Creates and populates project libraries and CM system; checks items and groups of items into the CM tools.
	Accepts baselined products from third parties and distributes products.
	Build system baselines for promotion and release.

	Maintains project status information and status accounting records and reports.
	Monitors problems (test incidents) and maintains database for collection and reporting of metrics.
The configuration administrator/librarian	Assists Asset and Configuration Management to prepare the Asset and Configuration Management Plan.
	Creates an identification scheme for Configuration Management libraries and the Definitive Media Library (DML).
	Creates an identification scheme for assets and the Definitive Spares (DS).
	Creates libraries or other storage areas to hold CIs.
	Assists in the identification of products and CIs.
	Maintains current status information on CIs.
	Accepts and records the receipt of new or revised configurations into the appropriate library.
	Archives superseded CI copies.
	Holds the master copies.
	Administers configuration control process.
	Produces configuration status accounting reports.
	Assists in conducting configuration audits.
	Liaises with other configuration libraries where CIs are common to other systems.
	The CMS/tools administrator
Monitors the performance and capacity of existing Asset and Configuration Management systems and recommends improvement opportunities and undertakes standard housekeeping and fine tuning under change control.	
Liaises with the configuration analyst and administrator/librarian on population of the asset and CMS; provides technical administration and support for asset and CMS, central libraries, tools common codes and data; undertakes regular technical housekeeping of the asset and CMS.	
Ensures the integrity and operational performance of the CM system.	

Table 2 ITIL roles and responsibilities related with CMS (OGC 2007c, p. 183)

3 PROCESS

About three months before our training started we have been asked for our preferred area where we would like have practice. Although my preferred area was not in the offered topics, I have taken the topic of IT Service Information Management. But within further specification of the topic, we realized that the scope was too wide, and during the second meeting it was agreed that the thesis should focus on the area of maintenance CMS.

The framework of this work was established by gathering information from persons inside Tieto by interviews or meetings. Although I was allowed to go through documents related to implementation of that system, I had to use other sources such as books and the internet to get basic information needed for further study.

Already from the starting meeting, it was clear that my experience with Tieto would not be enough to fulfill the expectations of the sponsor. This was confirmed within the first interview with persons from the project implementation team, where they are working on the implementation of new versions of Information Technology Service Management (ITSM) tools. The result of the meeting was the status of situation with the implementation and developing phases, plus their personal estimations. Before the next meeting I had decided to utilize tools provided by Tieto, and ask during the next interview if I might record our conversations. The system architect allowed me to use this recording feature of Microsoft Live Meeting, so I might go back through parts, which I had not understood before. Unfortunately, I was not able to do the same at the next meeting with the person responsible for maintenance of the old system.

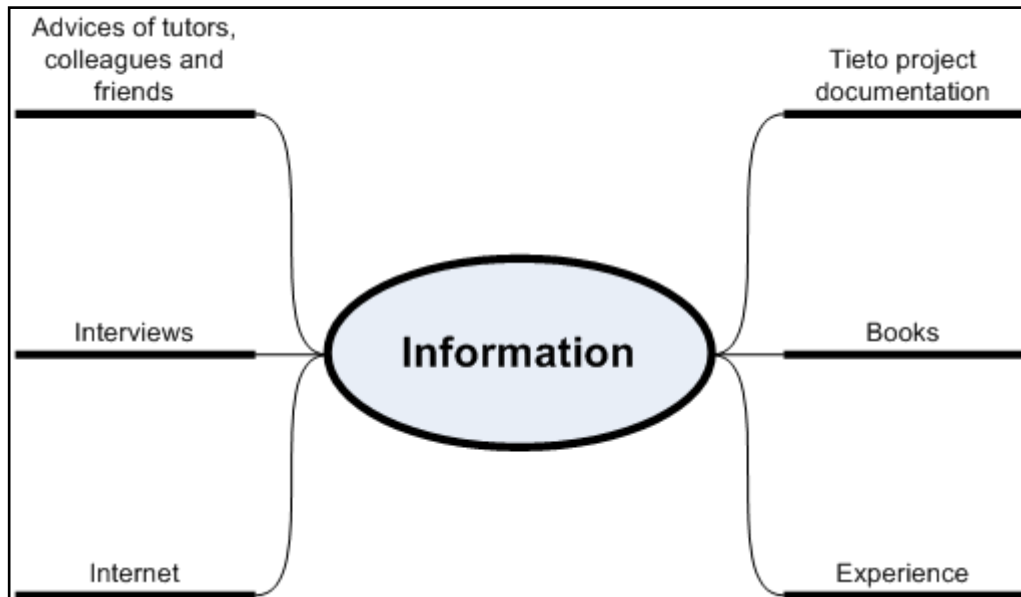


Figure 7 Ways of gathering information

Project documentation sources were given during interviews, and information connected to CMS were studied as you can see on the mind map in Figure 7, but for a better understanding was found information sources which were used for building such systems. For further research for sources was used the search engine from the company Google. Five books with an average of 300 pages is the ITIL version 3 collection, which was used as the main source of information. The thesis was put together with gathered information and you have just read the result.

Figure 8 shows a mind map with processes and their connections to stage of service.

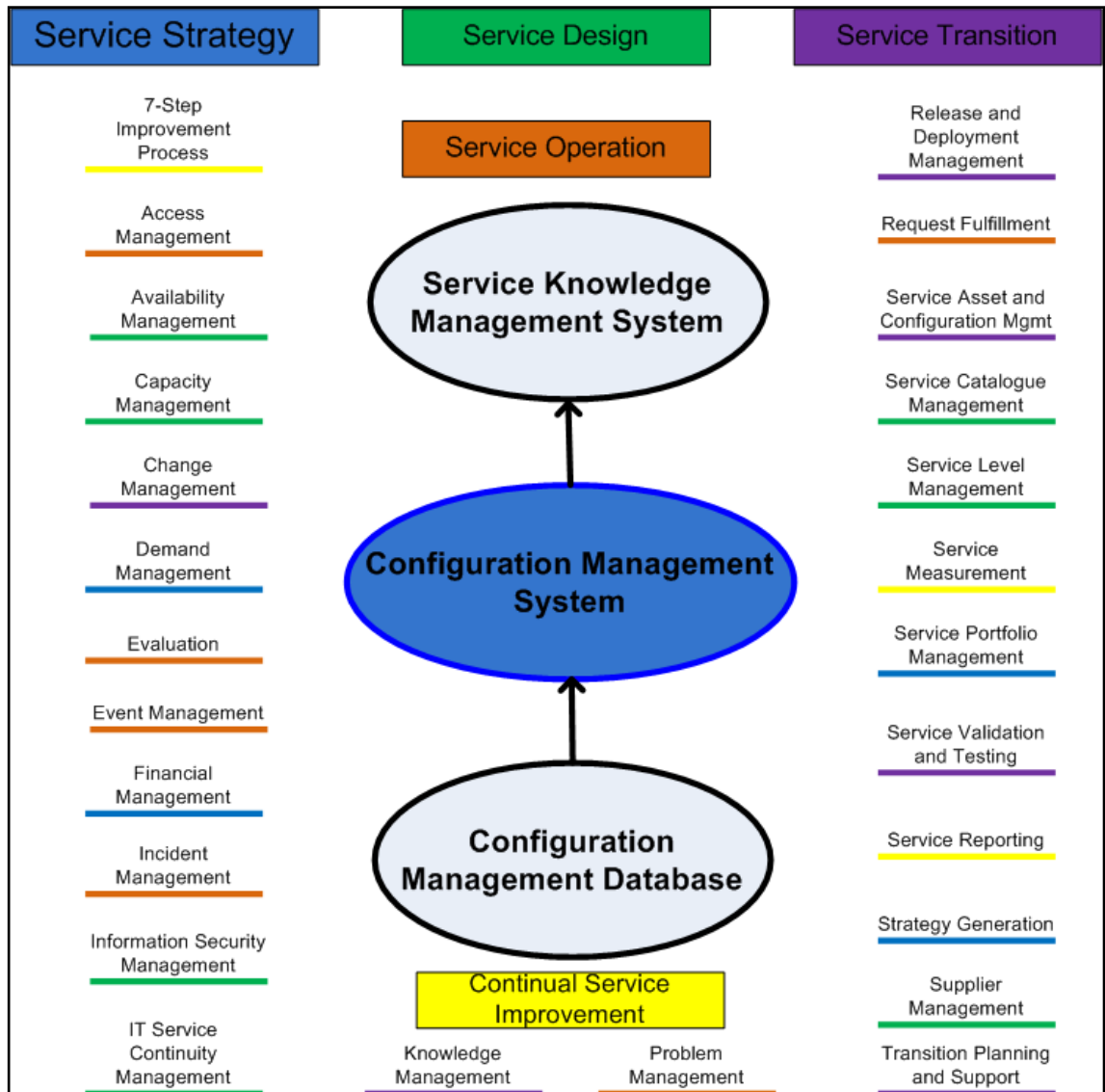


Figure 8 Mind map

4 MAINTENANCE

Return On Investment (ROI) is a value for determining the efficiency of an investment. It is the amount of money, which is impossible keep in positive values without maintenance. So this could be one answer for the question of why we have to maintain the CMS.

Maintaining something means keeping up the system without unplanned out brakes. But there is still a little chance that it can happen, and we have to know what is at risk and how we can recover the functionality of the system in a short time.

4.1 Roles and responsibilities

Architect

The life cycle of IT is a very quick, and implementation of CMS takes a long time, or is never ending process where you have to review all assets and set new Configuration Items (CI) according to new technology or business needs. CI itself is not so useful without links to other CIs, or services. These connections should be recorded by people within this service where the CI is used, and consulted with the Architect for assurance. As you can see, CMS is a very dynamic system and needs the continual focus of an Architect for assurance, user guidance and continual improvement.

Analyst

Nothing is perfect, and the same rule is for CMS. It can be made better with your requirements and recommendations for better usage and utilisation. These requirements should be analysed by a Requirement Analyst. The result of analysis is a decision about whether these requirements are valid, not contractual and have good influence on CMS utilisation and usage.

Engineer

With CMS we have to define the processes where CMS is used. Then people will be able to follow processes and be synchronized with CMS usage. As almost everything is changing with time, also here the processes are not the

same all the time and need to adjust to new service requirements. The Process Engineer will design and document with cooperation with people inside the process.

Trainer

The Trainer isn't needed only within the implementation phase, but also during the time when people are changing and CMS is changing. It should be somebody who will prepare these people for work with CMS. Nowadays there are a lot of ways to provide training lessons, so it depends on how the person will share information about CMS not only during training lessons.

Integrator

CMS itself is evolving and we should be ready to update CMS with new features, or plugins. This person is skilled with the knowledge of the whole system and will plan, test and implement new changes in CMS.

Tool support

Person/s with the role Tool Support will help with troubleshooting for problems with the usage of CMS on the user side.

Report Support

Outcomes from CMS are mainly in the form of reports which can be created, modified or deleted by the Report Support person.

CMS owner

The person responsible for the entire CMS is the CMS owner. Main task for this role is to keep all maintenance roles in place and have monthly or weekly meetings with people who are doing maintenance.

Librarian

The objective of this role is to follow usage attributes and CIs, and according to that, recommend CI changes. The next task for this role is to check data integrity with synchronized systems.

Role	Skill	Task
Architect	Person with this role should be certified with ITIL v3 and aware of CIs structure in organizations with such attributes.	Design CI types with people from services, where are CIs used the most time.
Analyst	Knowledge of Incident Management, Change Management and Problem Management with abilities to gather needed information for analysis.	Monitore and report all incidents, problems and changes which are open longer than usual time. Result of this task is to be sure, that ITIL processes are followed and all roles needed for service are in place.
		Licence and hardware capacity monitoring of CMS.
		Check usage of all attributes defined in CIs and according to that information, send recommendation to Architect.
Engineer	Ability to create documentation of processes, and knowledge of organization services and related teams, which are providing service.	Create, update or delete processes with documentation needed to follow them.
Trainer	Work experience with CMS and knowledge of all processes with ability to teach people, not only face to face.	Train new users of CMS and provide them information sources for further self-learning needed for their future work with CMS.
		Train and inform users of CMS whenever there will be changes related to their work with CMS.
Integrator	Trained person by the company providing CMS with all needed manuals and test environments.	Create and update CMS design guide document, where will be documented all settings, which were used during implementation or update of CMS.
		Check update release by provider of CMS.
		Test, implement or update CMS or its parts
Tool Support	Person able use provided CMS application with deeper knowledge than the usual user.	Create, update or delete account in CMS.
		Grant, revoke or create rights to CMS uses.
		Take care of communications when needed to solve user problem with CMS.
Report Support	Person with abilities to work with provided CMS and is able to work with reports.	Set up and check alerts needed for proper working of CMS.
		Create reports, update or delete reports needed for business, financial or other purposes.
CMS Owner	Person with knowledge of purpose of CMS and ability to speak with people around CMS for assurance, that there are not problems or conflicts.	Check if all roles needed for maintenance of CMS are in place.
Librarian	Person with deeper knowledge of Asset Management and abilities to take care of collected data. This person must also be trained by the CMS provider with all needed manuals to be sure of the ability to gather and federate all data sources.	Check connection between logical and physical CIs needed for service.
		Check validity of relations defined by discovery tools.
		Document connection of discovery tools and related data sources.
		Set rules for data federation needed to keep data consistent.
		Document data sources with needed information including interface, functions, tools and credentials needed for accessing information.
Check synchronization logs.		

Table 3 CMS maintenance roles and tasks

4.2 Monitoring

Monitoring is needed to notify responsible people about occurred issues. Most of the offered CMS have implemented their own monitoring and alert systems. It is possible to set up triggers at requested values which will send email or another form of notification. This is a kind of reactive maintenance when we have to react to an already broken or corrupted function of CMS, and our aim is to avoid these kinds of situations.

5 CONCLUSION

The goal of bachelor thesis was to find out the roles and tasks needed for the maintenance of CMS. With study of ITIL, where CMS is described as a tool for recording the IT state in an organization, were visible tasks and responsibilities of persons in specific roles. Information found there led me to create roles in this thesis similar to roles described in ITIL or related publications like the publicly accessible documentation of CMS providers. The next good source of information was meetings with people working on implementation or maintenance of the old version of CMS.

The researched area is wide and needs more time for study and concentration. I have gathered knowledge from ITIL which will be helpful with orientation in the next IT professions. With this bigger view on IT services as a whole, I have better ideas about organizations or companies might create income. This knowledge will help me understand organization leader decisions in the future. I have used my past working experience in Tieto to compare written theory and reactions of colleagues. I have found there lots of similarities, and for me it was just proof that ITIL is not just theory, but describes best practices. Experience gathered during practice training will lead to bigger concentration to keep opinions of sponsors and participants synchronized and stable during execution.

If I would start now

I would send this advice to myself before practice training started:

- Study the topic more before acceptance, because then you can have better view about what your work will look like. You can say “yes” to the topic which is given to you, but you realise the consequences after closer study.
- Don't give up work even when you have found out information, which you are trying to invent.
- Don't be afraid to disturb people even if you think that they are doing more important work than you do, because your results depend on them.
- Remind people about their promises and they will remember your tasks.

- Model core services with all CI and think about things, which can happen during time and if it can have influence on CMS and functionality.
- Discuss your plans of work with leaders to be sure that you are on the right track.

Personal experience showed that even with new technology and possibilities in communication it will not replace personal contact with colleagues from the team where all have similar aims and are working with the real system.

Organizations having such system like CMS, should define the owner of CMS. Owner will be then responsible for CMS and the task will be assignation of skilled persons to defined roles to have maintenance in place. Even better would be if the owner would be the team leader of people who are working on maintenance of CMS.

Companies like BMC, CA, Fujitsu, HP, IBM, and Microsoft provide CMS solutions, and all of them are following ITIL recommendations. Almost every machine or software has manuals and it is the same with provided solutions by the mentioned organizations. Provider's manuals should be studied carefully before creation of design and implementation starts. Assurance of best usage of CMS is proper documentation. The results of this thesis can be used as start up documentation for maintenance of CMS in organizations, where CMS have not included roles and tasks needed for maintenance in the manual. Specified maintenance task can be used as the basis for further discussion between persons responsible for maintenance of CMS. The structure of CMS can be different in every organization, and it is the same with roles and responsibilities needed for maintenance of implemented parts of CMS.

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