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Review of IT Service Management Tools Currently in Use in Finland

ITIL®, Implementation and Functionality

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Tutkimus tehtiin itSMF Finlandille, IT-palveluhallinnan yhteistyöfoorumille, joka pyrkii parantamaan IT-palvelunhallinnan toimintatapoja Suomessa ja maailmalla. IT-palvelunhallintaan kuuluu muun muassa loppukäyttäjille tarkoitetut tukipalvelut, tietojärjestelmien vikatilojen selvittäminen ja yhteydenpito tietojärjestelmien toimittajiin. IT-palvelunhallinnan käytännöt ovat olleet käytössä jo kauan, mutta käytäntöjä tukeva teknologia on kehittynyt ja tullut entistä monipuolisemmaksi. Tutkimuksen tavoitteena oli selvittää IT-palveluhallinnan työkalujen vaatimuksia sekä tutkia Suomen markkinoilla käytössä olevien IT-palvelunhallinnan työkalujen toiminnallisuuksia sekä niiden käyttökokemuksia.

Tutkimuksen viitekehykseksi valittiin IT Infrastructure Library (ITIL®) -malli, josta on muodostunut parhaiden käytäntöjen ohjeistus IT-palvelunhallinnalle. Tutkimuksessa selvitettiin ITIL®:n suosituksia IT-palvelunhallinan teknologioiden osalta. Tämän lisäksi tutkimukseen valittiin yhdeksän työkalua. Kaikkien työkalujen käytöstä haastateltiin sekä toimittajaa että yhtä heidän asiakastaan. Haastattelujen perusteella selvitettiin työkalujen toiminnallisuuksia ja kuinka implementaatioprojektia tuetaan toimittajan puolelta sekä käyttäjäkokemuksia työkalun käytöstä ja implementointivaiheesta asiakkaan puolelta.

ITIL® suosittelee IT-palvelunhallinnan työkalua organisaatioille tukemaan jokapäiväisiä toimintoja ja tuottamalla tietoa organisaation palveluista sekä tukemaan yrityksen koko elinkaarimallia. Tutkimuksessa mukana olleet työkalut olivat IT-palvelunhallinnan-ohjelmistoja eli työkaluja, jotka tukevat elinkaarimallin monta osaa. Tutkimuksessa ilmeni, että työkalut ovat tärkeitä yrityksille, mutta niitä ei kuitenkaan käytetä koko laajuudessaan. Käyttöönottoprojektit työkaluille olivat hyvin erilaisia, mutta usein hyvin menestyneitä. Jokaisessa tapauksessa työkalu auttoi organisaatiota toimimaan paremmin. Tämä tutkimus esittää asioita, jotka on hyvä pitää mielessään IT-palvelunhallinnan työkalua valitessa, implementoitaessa ja käytettäessä. Työkalua valitessa on tärkeää ymmärtää, mitä työkalun tulee tuoda yritykseen. Työkalun käyttöönotossa tärkeitä asioita ovat selkeät tavoitteet, hyvä suunnittelu sekä onnistunut koulutus. Nämä edesauttavat työkalun omaksumista yrityksessä sekä vähentävät mahdollista muutosvastarintaa.

Avainsanat	ITIL®, IT Palvelunhallinta

Abstract

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This thesis was carried out for itSMF Finland, an IT Service Management (ITSM) cooperation forum. The itSMF Finland is a non-profit organization dedicated to the development and promotion of best practice ITSM. ITSM is about providing a framework to structure IT-related activities and the interaction of IT technical personnel with business customers and users. ITSM practices have existed for some time already, but the technology to support it has only recently become more advanced and comprehensive. The purpose of this thesis was to investigate the requirements for ITSM tools and to create a "snapshot" of the current situation of the ITSM tool market in Finland.

IT Infrastructure Library (ITIL®) was chosen as a framework for this thesis, which is considered as de-facto best practice model in ITSM. This research investigates the requirements stated in ITIL® for the ITSM technologies. Nine tools were chosen for interviews. The object of the interviews was to gain information about what functionalities are included in the tools, how the vendor supports the customer in the implementation project, and what the customer experiences are regarding the implementation and use of the tool. These results were then compared to the ITIL® framework.

ITIL® recommends the tools to be utilized in the organization to provide data for analysis and improvement of the service provision and also to support the service lifecycle. All tools in this study were ITSM suites that have functionalities to support the service lifecycle widely. Based on the interviews the study shows that the tools are important for the organizations, but are not as widely used as they could be. The implementation projects varied greatly, but were relatively successful in all cases. All in all, the tools were considered beneficial for the organizations in all cases. This thesis provides important key-points to be kept in mind when selecting, implementing and using an ITSM tool. When selecting an ITSM tool it is extremely important to identify the benefits that it will bring to the organization. In the implementation phase it is essential to have clear goals, good design work and sufficient training. This ensures that the tool will be used as it was designed and opposition in the organization toward this change will be minimal.

Keywords	ITIL®, IT Service Management

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Abbreviations

AD	Active Directory
ASP	Application Service Provider
CMDB	Configuration Management Database
CMS	Configuration Management System
CI	Configuration Item
CSI	Continual Service Improvement
ERP	Enterprise Resource Planning
ITIL	Information Technology Infrastructure Library
ITSM	Information Technology Service Management
itSMF	information technology Service Management Forum
ISS	ITIL Software Assessment Scheme
KPI	Key Performance Indicator
LDAP	Lightweight Directory Access Protocol
OGC	Office of Government Commerce
OLA	Operational Level Agreement
RFC	Request for Change
SaaS	Software as a Service
SKMS	Service Knowledge Management System
SLA	Service Level Agreement
SLR	Service Level Requirement
SD	Service Design
SO	Service Operation
SS	Service Strategy
ST	Service Transition

1 Introduction

This section introduces briefly what Information Technology Service Management is (section 1.1.). In addition, it covers the background (section 1.2.), purpose (section 1.3.), research questions (section 1.4.), the contents of this thesis (section 1.5.) and a reader's guide (section 1.6.).

1.1 What is IT Service Management?

ITIL® defines Service Management as "a set of specialized organizational capabilities for providing value to customer in the form of services" (ITIL® Service Strategy: 15). In case of IT, the IT Service Management, or ITSM, is about maintaining a reliable, stable and cost-effective IT infrastructure to support business services and processes. This means that the IT department then moves from being a technology provider to a service provider (Pink Elephant. 2009: 3). Services depend on good management of IT assets in today's technology dependent world. The Information Technology Infrastructure Library (ITIL®) was developed to provide a best practice framework for IT organizations to improve their IT Service Management. (Cartlidge, Alison et al. 2007: 6.)

1.1.1 IT Service Management Forum

The itSMF® is a non-profit organization dedicated to the development and promotion of "best practice" IT Service Management. It is an independent forum for IT Service Management professionals worldwide. It was originally founded in the UK in 1991. It has over 6000 member companies from a great variety of businesses across the globe in over 50 sections. (About itSMFI. 2008.)

The importance of the forum has increased over the years as businesses have become more and more dependent on technology to deliver their products to the market. The benefits of adopting "best practice" IT Service Management is prevalent and itSMF® provides a good platform by providing industry experts, information sources and events for their members. (About itSMFI. 2008.)

The itSMF® Finland is the Finland section of itSMF®. It is organized by its members and operates on voluntary work. Its goals are to increase co-operation, share knowledge and research activities. (itSMF® Finland.)

1.2 Background

Around two years ago the itSMF Finland had a survey done among its members on popular research topics. One of the topics that came up was ITSM tools, especially their implementation and user experiences in Finland. In October 2010 the research topic was then offered to two students looking for a topic for their final thesis. The focus was decided to be on the user experience and implementation of ITSM tools and the technological recommendations made in ITIL® framework.

The tools selected for this research come in a wide variety; some are the biggest and most popular tools in the world, some are smaller tools, including two Finnish ones. The tools in question are from the following companies: Altiris, Axios Systems, BMC Remedy, CA Technologies, Efecte, HP, IBM, Requeste and Service-now.com.

1.3 Purpose of Thesis

The scope of this thesis is limited to investigating the requirements stated in the ITIL® V3 framework and closely related assessment models, ITIL® Software Assessment Scheme (ISS) and PinkVERIFY™, and one research about ITSM tools, Gartner's 2010 Magic Quadrant for the IT Service Desk.

This thesis is also set to find out the customer experiences on implementation and use of the selected ITSM tools. It will be achieved by interviewing the vendor of the tool and one customer using the tool. Vendor interviews cover the basic information of the tool as well as the functionalities and how the vendor handles the customer implementation of the tool.

Customer interviews then focus on how successful the implementation of the tool was and what the experiences of using the tool are. The findings of these interviews will be compared to the best practice models of the ITIL® framework by observing how reality stands up to theoretical models.

1.4 Research Questions

The research questions of this thesis are the following:

- What recommendations does IT Infrastructure Library (ITIL®) provide for the IT Service Management (ITSM) technology and the process of selecting, implementing and using it?
- How do the selected vendors view the functionality and implementation of their tools?

- What are the customers experiences regarding the implementation and use of the selected tools?

1.5 Contents of Thesis

Section 2 of this thesis introduces Information Technology Infrastructure Library (ITIL®). It explains the ITIL® lifecycle phases and the processes included. Technological recommendations regarding ITIL® can be found in section 3.

Section 4 discusses the most notable research and comparisons on ITSM tools and vendors. It also introduces the ITIL® Software Assessment Scheme (ISS), PinkVERIFY™ and Gartner's Magic Quadrant for IT service desk.

Section 5 briefly explains the methodology of this thesis and section 6 introduces each of the ITSM tools along with the vendor and customer interviews. After each interview there are general comments from the interviews. These comments are also shown in a table that can be found in appendix 6 and 7. The summary also includes general comments and other points brought up by the interviews.

Section 7 discusses the findings of this research. It includes a discussion on how an organization should select a tool to buy and how to achieve successful implementation of ITSM tool. It will also highlight some of the market trends that came up in the interviews. Section 8 discusses the reliability of this research. The summary of this thesis can be found in section 9.

1.6 Reader's Guide

As stated in the previous section, this thesis contains a great deal of information and covers, for instance, basic knowledge about ITIL® V3 in addition to knowledge of technological requirements. Not all information is important for all readers. This subsection should clarify the sections that are the most important ones for each reader.

Basic information about the processes is introduced in section 2. This section is relevant for those who are new to ITIL® and need more information about the main processes introduced in ITIL® V3 framework.

The answer for research question 1 can be found in section 3. It introduces the main recommendations that ITIL® states for the technology used in ITSM tools. This information is important for people who are considering acquiring a new ITSM tool. It

provides basic knowledge for what to look for during selecting, implementing and using the tool.

Additional information about the requirements for today's ITSM tools can be found in section 4, where two different assessment models, ITIL® Software Assessment Scheme (ISS) and PinkVEFIFY™ as well as one research about ITSM tools, Gartner's Magic Quadrant for IT service desk, are introduced. These two assessment models and one research will give more information on what to look for when acquiring an ITSM suite.

In section 6 can be found the nine case studies included in this research. This information is useful for people who are looking for a new ITSM suite for their organization. It describes the experiences that these vendors and customers had in connection with selecting, implementing and using the tool.

Conclusions can be found in section 7. This section is useful for people who are going to implement a new ITSM suite. It gives recommendations on what to look for before starting the project to make sure everything is in place.

Appendices include several useful tables, the interview questions that were used and other additional background information that is helpful for this thesis.

2 IT Infrastructure Library (ITIL®) Framework

2.1 General ITIL® Theory

ITIL® is a collection of common sense guidelines to guide organizations in their quest to do things that work. The main aim is to adapt a common framework of practices that unite all areas of the IT service provision to deliver value to the business.

ITIL® service management practices are not based on any particular technology platform, which leads to the fact that ITIL® is very widely applicable to any IT organization and industry type. It is useful for all kinds of organizations from small companies to large enterprises, in public or private sectors, internal or external service providers, within any technical environment. As a conclusion, ITIL® can be described as a collection of best practices of the world's best in class service providers. ITIL® can also be described as a collection of good practices because of the fact that every best practice will become a common practice over time and will thus be replaced by new best practices. (Cartlidge, Alison et al. 2007: 2.)

The ITIL® Service Management practice framework's objective is to provide services to business customers that are fit for purpose and fit for use. It is crucial for business that services are stable and reliable and can be trusted. (ITIL® V3 Service Strategy 2007: 17.)

ITIL® offers best practice guidance to all types of organizations that provide services to a business through five publications that are structured around the service lifecycle. Each publication is designed to provide structure, stability and strength to service management capabilities and have a direct impact on the performance of a service provider. This is enabled through durable principles, methods and tools. (ITIL® V3 Service Strategy 2007: 8.)

ITIL® V3 Service Management practices consist of five core guidance topics, which are Service Strategy (SS), Service Design (SD), Service Transition (ST), Service Operation (SO) and Continual Service Improvement (CSI). (ITIL® V3 Service Strategy 2007: 8.)

2.1.1 Service Lifecycle

The service lifecycle contains the five previously mentioned core publications. Each of these publications relies on service principles, processes, roles and performance measures. The service lifecycle is conducted as a hub and spoke design where the

Service Strategy is at the hub. Service Design, Service Transition and Service Operation are described as lifecycle stages that are anchored by Continual Service Improvement.

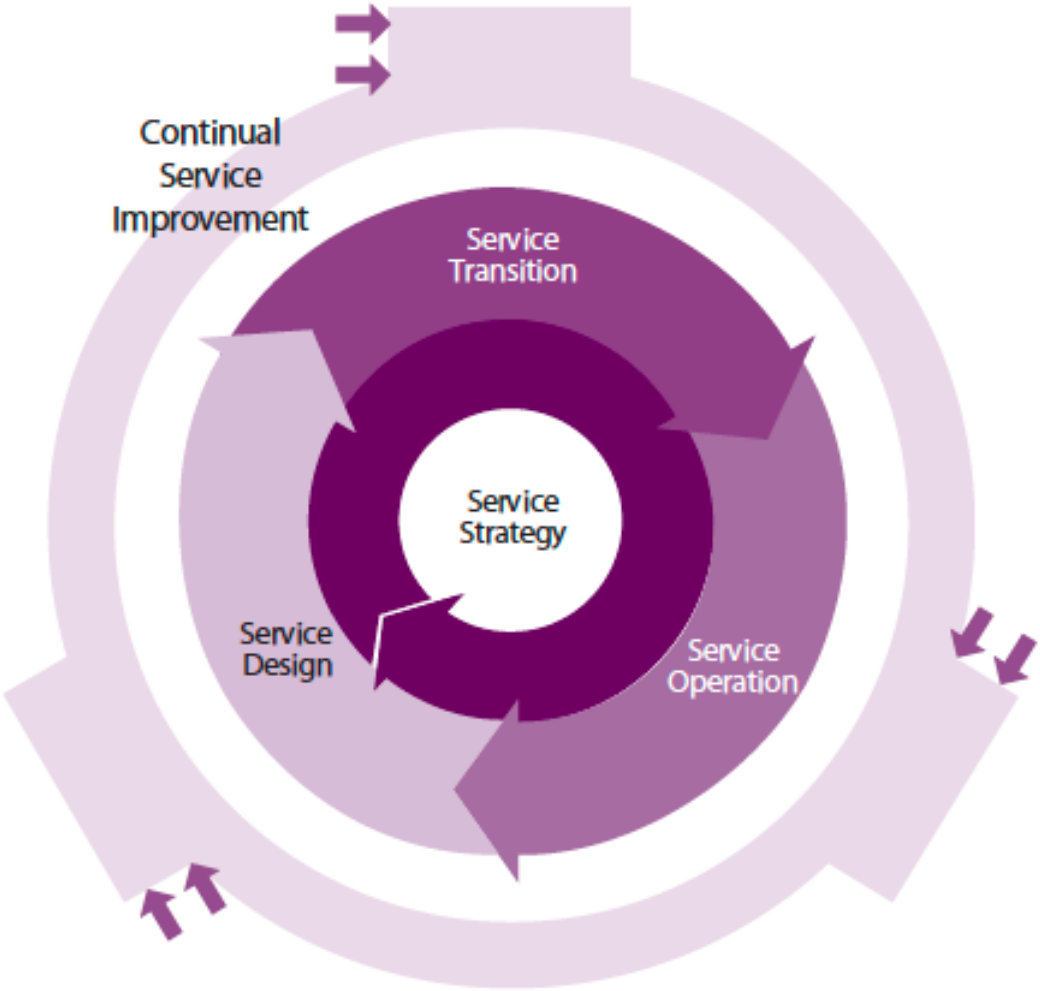

Figure 1. ITIL® Service Lifecycle. (ITIL® V3 Service Design 2007: 6.)

Each part of the lifecycle is in close contact with the others. This allows a constant set of checks and balances throughout the service lifecycle to ensure that changes towards business needs are always effectively adapted. (ITIL® V3 Service Strategy 2007: 27.)

At the heart of the Service Lifecycle is the key principle – all services must provide measurable value to business objectives and outcomes. ITIL® Service Management focuses on business value as its prime objective. Each practice revolves around ensuring that everything a service provider does to manage IT services for the business customer can be measured and quantified in terms of business value. This has become extremely important today as IT organizations must operate themselves

as businesses in order to demonstrate a clear return on investment and equate service performance with business value to the customer. (ITIL® V3 Service Strategy 2007: 24)

2.2 Service Strategy

Service Strategy is at the core of the Service Lifecycle. Service strategy is about designing, developing and implementing service management "not only as an organizational capability, but also as a strategic asset" as ITIL® states (ITIL® V3 Service Strategy 2007: 8).

This brief explanation of Service Strategy will only cover the three processes in Service Strategy, Financial, Service Portfolio and Demand Management. Service Strategy, however, covers a wide variety of other topics from development of markets, service assets and implementation of service lifecycle among others. (ITIL® V3 Service Strategy 2007: 8.)

Service Strategy should be considered as providing guidance regarding the objectives and expectations having to do with market spaces, customers and opportunities. It is about achieving a position where the organization is best to handle costs and risks related to their service portfolios and to support operational performance and distinctive performance. (ITIL® V3 Service Strategy 2007: 8.)

As pointed out in ITIL®, Service Strategy is about thinking why something is to be done before thinking of how to do it (ITIL® V3 Service Strategy 2007: 8).

2.2.1 Service Strategy Processes

This section introduces the Service Strategy processes. These processes are vital for an organization in running a business. They are more about the strategy and goals of the organization and the financial situation. Without these the organization will not understand the direction in which it is going.

2.2.1.1 Service Portfolio Management

ITIL® describes Service Portfolio Management as "a dynamic method for governing investments in service management across the enterprise and managing them for value" (ITIL® V3 Service Strategy 2007: 120). It describes the provider's services in terms of business value. It is meant to describe business and market needs and the response to those needs. It allows comparison to competitive services providing a mutual language with business value terms. It also helps to understand why customers

buy these services and what kind of pricing models should be used. A portfolio should be a group of investments that share similar characteristics grouped by size, discipline or strategic value. (ITIL® V3 Service Strategy 2007: 119.)

The work methods of the Service Portfolio Management process are: define, analyze, approve and charter. It starts by defining the services and business cases and validates the portfolio data in this way. Analyzing the portfolio data is about maximizing the value, balancing supply and demand and prioritizing. Finalizing the portfolio involves authorizing services and approving resources and eventually communicating decisions, allocating resources and chartering the services. (ITIL® V3 Service Strategy 2007: 123.)

2.2.1.2 Financial Management

Understanding the value of IT services is important for the organization as it supports the decision making and brings in operational visibility and insight to the company. This is what Financial Management is set to achieve by providing financial quantification to the IT services and service assets. Financial Management can be described as IT working together with the business to identify and agree on the value of services being received. With rapid changes happening in the IT landscape, the need for understanding the business of IT is becoming increasingly important. (ITIL® V3 Service Strategy 2007: 97.)

The Financial Management process generates operational decision-making data to answer questions about profits and revenues, costs, service inefficiencies and strategic approach among others. The lack of such data will create problems in decision-making and strategy making it little more than guessing. Financial Management provides the common language for IT to communicate with the business. (ITIL® V3 Service Strategy 2007: 97.)

2.2.1.3 Demand Management

In service systems demand and capacity are tightly coupled due to the intangible nature of services. Services cannot be manufactured in advance in anticipation of demand, but are produced while they are consumed. This is why Demand Management is critical in service management. Properly managed demand will reduce the risks, caused by uncertain demand, for service providers. (ITIL® V3 Service Strategy 2007: 129.)

Excess capacity is undesirable as customers are reluctant to pay for capacity that generates no value to them. Insufficient capacity on the other hand has an impact on the service quality and can limit the growth of the service. While demand and demand patterns can be influenced by different methods such as off-peak pricing and volume discounts, it does not solve the issue that capacity needs demand. (ITIL® V3 Service Strategy 2007: 129.)

2.3 Service Design

Service Design is the stage where Service Strategy turns into the blueprint for delivering the business objectives. Services must be designed with the business objectives in mind. Otherwise the services do not provide the needed value to the business. Service Design provides guidance for the design and development of services and service management practices and covers design principles and methods. Service Design is the stage where strategic objectives are converted into portfolios of services and service assets. (ITIL® V3 Service Design 2007: 7.)

The scope of Service Design is not limited only to new services but also includes the changes and improvements necessary to increase or maintain value to customers over the whole service lifecycle. It guides organizations to achieve service levels and to conform to the standards and regulations. As a conclusion, it guides how to develop design capabilities for service management. (ITIL® V3 Service Design 2007: 7.)

2.3.1 Service Design Processes

This section introduces the Service Design processes. The key topics in Service Design are Service Catalogue, Service Level, Capacity, Availability, IT Service Continuity, Information Security and Supplier Management.

2.3.1.1 Service Catalogue Management

The purpose of the Service Catalogue Management process is to provide a single source of consistent information and ensure that the information is available for those who are approved to access it. The information consists of all of the agreed services. The goal is that the Service Catalogue is not only produced but also maintained. The Service Catalogue should include accurate information on all operational services and also those being prepared to run operationally. The objective and scope of the process is to manage the information and ensure that it reflects the current details, status, interfaces and dependencies of all services. (ITIL® V3 Service Design 2007: 60.)

The Service Catalogue Management activities should include the definition of the service and the production and maintenance of an accurate Service Catalogue. The organization should define Interfaces, dependencies and consistency between the Service Catalogue and Service Portfolio. Also all services, supporting services and components and Configuration Items (CIs) within the Service Catalogue and the Configuration Management System (CMS) should be defined. (ITIL® V3 Service Design 2007: 61.)

The Service Catalogue has two aspects, which are the *Business Service Catalogue* and the *Technical Service Catalogue*. The Business Service Catalogue includes details of all the IT services delivered to the customer with relationships to the business units and the business process that rely on the IT services. The Technical Service Catalogue includes all the same details as the Business Service Catalogue and in addition the relationships to the supporting services, shared services, components and Configuration Items necessary to support the provision of the service. (ITIL® V3 Service Design 2007: 62.)

The difference between them is that the Business Service Catalogue is the customer view of the Service Catalogue and the Technical Service Catalogue is not. The Technical Service Catalogue is formed to define all the links between the critical relationships in the organization. This information is not needed from the customer point of view. (ITIL® V3 Service Design 2007: 62.)

2.3.1.2 Service Level Management

The main aim of the Service Level Management (SLM) process is to negotiate, agree and document IT service targets through Service Level Agreements (SLAs) and Service Level Requirements (SLRs) and monitor and produce reports on the ability to deliver the agreed level of service. It is vital for every service provider organization to meet the targets. If these targets are accurately formed and reflect the requirements of the business, the services delivered will align with the business requirements and meet the expectations of the customers. The goal of the SLM process is to ensure that an agreed level of IT services is provided. The goal is also to ensure that future services are delivered to agreed achievable targets. The purpose of the SLM process is to ensure that all operational services and their performance are measured in a consistent professional manner and that the services and the reports produced meet the needs. (ITIL® V3 Service Design 2007: 65.)

The quality of the Service Portfolio and the Service Catalogue affects a lot the success of the Service Level Management. The Service Portfolio and the Service Catalogue provides the necessary information on the services crucial for the SLM process. (ITIL® V3 Service Design 2007: 65.)

The objectives of Service Level Management are to define, document, agree, monitor, measure, report and review the level of IT services provided. SLM ensures that relationships and communication between the business and customers is provided and furthermore improved. (ITIL® V3 Service Design 2007: 65.)

2.3.1.3 Capacity Management

The goal of the Capacity Management process is that cost-justifiable IT capacity is always available in all areas of IT. The IT capacity should match the current and future needs of the business. The purpose is to provide management for all capacity and performance related issues. (ITIL® V3 Service Design 2007: 79.)

An appropriate and up-to-date Capacity Plan should be produced and maintained with an approach where it reflects both current and future need of the business. It is important to manage the capacity and performance of both services and resources to ensure that service performance achievements meet or exceed all of their agreed performance targets. The Capacity Management process should also assist the diagnosis and resolution of capacity and performance related incidents and problems. The Capacity plan should assess the impact of all changes and ensure that proactive measures are implemented wherever it is cost-justifiable. (ITIL® V3 Service Design 2007: 79.)

2.3.1.4 Availability Management

The main goal of the Availability Management is that the agreed level of service is available and it either matches or exceeds the current and future needs of the business, in a cost-effective manner. The purpose is to ensure that all availability targets are measured and achieved. (ITIL® V3 Service Design 2007: 97.)

An appropriate and up-to-date Availability Plan should be produced and maintained and it should reflect the current and future needs of the business. Advice and guidance should be provided on all availability-related issues to all other areas of the business and IT. Service availability achievements should meet or exceed all their agreed targets by managing availability of services and resources. Availability Management should

assist with the diagnosis and resolution of availability related incidents and problems and assess the impact of all changes on the Availability Plan. Proactive measures should be implemented to improve the availability of services. (ITIL® V3 Service Design 2007: 97.)

2.3.1.5 IT Service Continuity Management

Continued and high level of availability of IT is critical for the business. Therefore technology plays a big role in most business processes. The goal of IT Service Continuity Management is to support the Business Continuity Management process to ensure that the required IT technical and service facilities can be resumed within required and agreed timescales. These facilities include computer systems, networks, applications, data repositories, telecommunications, environment, technical support and Service Desk. Risk reduction measures and recovery options should be introduced and maintained. (ITIL® V3 Service Design 2007: 125.)

IT Service Continuity Management ensures that IT Service Continuity Plans and IT recovery plans are maintained. These support the overall Business Continuity Plans of the organization. The Business Impact Analysis should be completed to ensure that all continuity plans are in line with changing business impacts and requirements. Regular Risk Analysis and Management exercises are necessary to conduct to ensure that IT services are managed within an agreed level of business risk. IT Service Continuity Management is also in close contact with other continuity and recovery-related issues in all other areas. Proactive measures should be implemented for improving the overall availability of services. (ITIL® V3 Service Design 2007: 126.)

2.3.1.6 Information Security Management

ITIL® states that "the goal of the Information Security Management process is to align IT security with business security and ensure that information security is effectively managed in all service and Service Management activities" (ITIL® V3 Service Design 2007: 141).

Information Security Management provides the strategic direction for security activities and ensures that the set objectives are met. Information security needs to be considered within the whole corporate governance framework. Information security risks need to be appropriately managed and the information resources need to be used responsibly. (ITIL® V3 Service Design 2007: 141.)

The purpose of Information Security Management is to manage all IT security activities and bring focus for all aspects of IT security. Information Security Management includes also data stores, databases and metadata. The objective is to protect the interest of those users relying on information and the systems and communications, which deliver the information. The objective is to avoid failures of availability, confidentiality and integrity. Availability issues are met, when the information is available and usable when required. This requires that the systems are able to resist or prevent attacks and also be able to recover from them. Confidentiality issues are met, when the information is available only for those who have the right to know. Integrity issues are met, when the information is complete, accurate and protected against any unauthorized access or modification. These issues should be considered in the context of business and business processes and the primary guide should come from the business. (ITIL® V3 Service Design 2007: 141.)

2.3.1.7 Supplier Management

According to ITIL® "the goal of the Supplier Management process is to manage suppliers and the services they supply, to provide seamless quality of IT service to the business, ensuring value for money is obtained" (ITIL® V3 Service Design 2007: 149).

The aim of the Supplier Management process is to ensure that IT service targets and business expectations are managed and met by suppliers and the services they provide. Business benefits for the organization must be realized in an efficient way and therefore another aim for the Supplier Management process is to raise awareness of the business context of working with partners and suppliers. The Supplier Management process should be involved in all stages of the Service Lifecycle. Managing the suppliers and partners is essential to the provision of quality IT services because it ensures that every part in the organization drives for seamless work and for greater good. (ITIL® V3 Service Design 2007: 149.)

The purpose of the process is to obtain value for money from suppliers and their services. It needs to be ensured that suppliers meet the targets set in the contracts and agreements. The objective is to ensure that underpinning contracts and agreements meet the business needs and agreed targets. The relationships with suppliers and their performance need to be managed. Contracts with the suppliers need to be managed and aligned with their lifecycle. Supplier policy and Supplier and

Contract Database should be maintained and supported. (ITIL® V3 Service Design 2007: 149.)

2.4 Service Transition

ITIL® defines Service Transition as "guidance for the development and improvement of capabilities for transitioning new and changed services into live service operation" (ITIL® Service Transition 2007: 7). In short, this means that Service Transition is the stage where the requirements of Service Strategy and Service Design are effectively realized in Service Operation and the risk of failure and disruption is taken into account. Practices from change, configuration, asset, release and deployment, programme and risk management are combined and placed in the practical context of service management. (ITIL® V3 Service Transition 2007: 7.)

Service Transition is the stage where guidance on managing the complexity of changes to services and service management processes is provided. When these changes are managed undesired consequences are prevented while allowing innovation. (ITIL® V3 Service Transition 2007: 7.)

2.4.1 Service Transition Processes

This section will briefly talk about each of the Service Transition phase processes. It will explain what the goal in each of these processes is and why organizations need to support them. The processes included in Service Transition are: Transition Planning and Support, Change Management, Service Asset and Configuration Management, Release and Deployment Management, Service Validation and Testing, Evaluation and Knowledge Management.

2.4.1.1 Transition Planning and Support

The purpose of the Transition Planning and Support is to plan the right amount of capacity and resources for the new or changed service through building, releasing, testing, deployment and establishment. The purpose is also to provide support for the Service Transition teams and employees. The required changes need to be planned to ensure that the integrity of all assets and configurations can be maintained through the Service Transition stage. The reporting of issues, risks and deviations need to be planned to ensure that appropriate stakeholders and decision makers are able to make the right decisions. (ITIL® V3 Service Transition 2007: 35.)

The goal of Transition Planning and Support is that activities and resources are coordinated across projects, suppliers and service teams if required to ensure that the requirements of Service Strategy and Service Design are realized in Service Operations. Risks for failure and disruption should be taken into account and they should be identified, managed and controlled. (ITIL® V3 Service Transition 2007: 35.)

The objective is to plan and coordinate the resources for establishing a new or changed service into production. Predicted cost, quality and time estimates are vital measurements for this process. The common framework of standard re-usable processes and supporting systems needs to be adopted by all parties. (ITIL® V3 Service Transition 2007: 35.)

2.4.1.2 Change Management

Changes should be managed to optimize risks, minimize the severity of impacts and disruption and to be successful at the first attempt. Changes arise either proactively or reactively. Proactive changes are changes where the benefits for business are sought. Reactive changes are changes where errors in the business need resolving or the business needs to adapt to changing circumstances. (ITIL® V3 Service Transition 2007: 42.)

Changes require efficient and prompt handling to gain business benefits. Therefore the purpose of the process is to ensure that standardized methods and procedures are in use. The Configuration Management System (CMS) is used for recording all changes to service assets and CIs. The purpose is also to optimize the overall business risks. (ITIL® V3 Service Transition 2007: 42.)

The goal of the process is to respond to the customer's changing business requirements and respond to the business and IT requests for change. Changes need to align with the business needs and maximize the value of the business and reduce incidents, disruption and re-work. (ITIL® V3 Service Transition 2007: 43.)

The objective is to ensure that changes are recorded, evaluated, authorized, prioritized, planned, tested, implemented, documented and reviewed. All changes to baseline service assets and CIs needs to be recorded. (ITIL® V3 Service Transition 2007: 43.)

2.4.1.3 Service Asset and Configuration Management

Assets need to be managed well to ensure that the organization can be fully efficient and effective. The purpose of the process is to ensure that the service assets are managed in a way that supports the other Service Management processes. (ITIL® V3 Service Transition 2007: 65.)

Service assets and CIs need to be identified, controlled, recorded, reported, audited and verified. This includes versions, baselines, constituent components, their attributes and relationships. It needs to be ensured that only authorized components are used and only authorized changes are made on the service lifecycle. The integrity of service assets and CIs needs to be protected and controlled. An accurate and complete Configuration Management System (CMS) is vital for this process and it needs to be well maintained. (ITIL® V3 Service Transition 2007: 65.)

The goal of the process is to support the business and customer's control objectives and requirements in order to provide accurate configuration information. This enables people to make the right decisions at the right time. The quality and compliance issues caused by improper configuration of services and assets needs to be minimized and the service assets, IT configurations, capabilities and resources optimized. (ITIL® V3 Service Transition 2007: 65.)

The objective of the process is to define and control the components of services and infrastructure. Accurate configuration information needs to be maintained regarding the historical, planned and current state of the services and infrastructure. (ITIL® V3 Service Transition 2007: 65)

2.4.1.4 Release and Deployment Management

The aim of the Release and Deployment Management process is to build, test and deliver the capability to provide the services specified in the Service Design stage. The purpose of the process is to define and agree on the release and deployment plans. Each release package should consist of a set of related assets and service components that are compatible with each other. The integrity between these is maintained throughout the transition activities and recorded in the Configuration Management System (CMS). All release and deployment packages should be available for tracking, installing, testing, verifying and uninstalling or backing out if needed. Managing the change of organization and stakeholder should be observed during the release and deployment activities. Deviations, risks and issues related to the new or changed

service should be recorded and managed. Knowledge transfer is needed to enable the customers and users to optimize their use of the service. (ITIL® V3 Service Transition 2007: 84.)

The goal of the process is to deploy releases into production while establishing effective use of the service to deliver value. The objective of the process is to ensure that there are clear and comprehensive release and deployment plans. These plans should enable the customer and business to align their activities with these plans. The process ensures that the release package is possible to be built, installed, tested and deployed efficiently, successfully and on schedule. Release and Deployment management also ensures that systems, technology and organization must be capable of delivering the agreed service requirements. Minimum unpredicted impact is desirable for the production services, operations and support organization. The process ensures that the customers, users and service management staff are satisfied with the practices and outputs. (ITIL® V3 Service Transition 2007: 84.)

According to ITIL® "the scope of Release and Deployment Management includes the processes, systems and functions to package, build, test and deploy a release into production and establish the service specified in the Service Design package before final handover to service operations" (ITIL® V3 Service Transition 2007: 84).

2.4.1.5 Service Validation and Testing

The main approach for the Service Validation and Testing process is to establish that the Service Design and release will deliver the services in a way that is fit for purpose and fit for use. The testing of the services is a vital phase in the service management process. There are numerous downsides to overlooking testing. The result is a rise in incidents, service desk calls, problems and errors and costs. (ITIL® V3 Service Transition 2007: 115.)

The purpose of the process is to plan and implement a structured validation and test process. This process ensures that the new or changed service supports the customer's business and other requirements from the stakeholders. The purpose is to identify, assess and address issues, errors and risks to guarantee quality throughout the stage. Therefore the goal of the process is to assure that services provide value to the business. (ITIL® V3 Service Transition 2007: 115.)

The objective of the process is to provide confidence in releases to deliver the expected outcomes and value within the defined costs, capacity and constraints. The

requirements from the customer and stakeholder should be confirmed so that those are correctly defined. Fixing an error in the early stages is considerably cheaper than fixing them in the production phase. (ITIL® V3 Service Transition 2007: 115.)

2.4.1.6 Evaluation

The Evaluation process takes into consideration whether the performance of a service is acceptable, whether it brings value for money and also whether it will be proceeded with, accepted into use and paid for. The purpose of the Evaluation process is to provide ways for determining the performance of a service. These ways should be consistent, standardized and mutually agreed upon in the company. The goal of the process is to avoid misunderstandings in stakeholder's expectations and provide effective and accurate information to Change Management. The objective is to evaluate the intended effects of a service change and provide quality outputs from the evaluation process to ensure that Change Management can make effective decisions. Evaluating is an important phase to ensure that expectations are set realistically and to avoid anything that could result in production performance not meeting the expectations. (ITIL® V3 Service Transition 2007: 138.)

2.4.1.7 Knowledge Management

The purpose of the process is to make sure that the right information is delivered in the right time and to the right place or person. This enables people to do informed decisions efficiently. The goal of the process is to enable improved quality in the decision-making process and ensure that the information is reliable and secure, and that data is always available. The objectives of the process are to enable service providers to be more efficient and services to be top quality. Also increased satisfaction level and reduced costs of the service are important objectives for Knowledge Management. The process should ensure that employees have a clear and common understanding of the value of their services and how the benefits are realized. It should also ensure that the employees have information about the usage of their services, consumption states, delivery constraints and difficulties faced by the customer. Knowledge Management is relevant to all lifecycle sectors. (ITIL® V3 Service Transition 2007: 146.)

2.5 Service Operation

Service Operation is the phase of service lifecycle that includes the management practices of running the day-to-day operations of services (ITIL® V3 Service Operation

2007: 4). This section will provide brief introductions to the processes included in the Service Operation part of lifecycle: Event, Incident, Problem, Request Fulfilment and Application Management. (ITIL® V3 Service Operation 2007: 6.)

From a wider perspective Service Operation provides guidance to achieve effectiveness and efficiency in the delivery and support of services. This is to guarantee value for the customer and the service provider. This is where the strategic objectives are finally realized. The purpose is to support stability in service operation. (ITIL® V3 Service Operation 2007: 6.)

2.5.1 Service Operation Processes

This section discusses briefly all the processes in the Service Operation phase. Many of these processes are what are commonly referred to basic Service Desk processes. Incident Management is the most implemented process in the organizations.

2.5.1.1 Event Management

Event is defined in ITIL® Service Operation as "any detectable or discernible occurrence that has significance for the management of the IT Infrastructure or the delivery of IT service and evaluation of the impact a deviation might cause to the services" (ITIL® V3 Service Operation 2007: 35). Events in normal operation could be notifications in situations such as an e-mail has reached its destination or a user has logged in to an application. An example in the case of an exception could be a user attempting to log in to an application using an incorrect password. Event management is the process monitoring these events, allowing normal operation and detecting exceptions. (ITIL® V3 Service Operation 2007: 35.)

Good monitoring and control systems are invaluable in running Service Operation as it depends on knowing the status of infrastructure and any exceptions. This can be achieved by using two kinds of tools: active monitoring tools that monitor important configuration items and report any exceptions and passive monitoring tools that detect operational alerts and communications of configuration items (CIs). (ITIL® V3 Service Operation 2007: 36.)

2.5.1.2 Incident Management

The Incident Management process has a goal of restoring service operation back to normal as fast as possible minimizing thus the possible negative effects after an incident. The purpose is to ensure the highest possible quality and availability for the

service. Service Level Agreements (SLAs) have defined what here is considered as normal service operation. ITIL® Service Operation defines an incident as "an unplanned interruption to an IT service or reduction in the quality of an IT service" (ITIL® V3 Service Operation 2007: 46). The difference between an incident and an event should be clear as to not mix them. Incidents are events that cause or could cause disruption to a service. (ITIL® V3 Service Operation 2007: 46.)

Incidents can be reported by users through Service Desk or direct interface between Event Management and Incident Management, by technical staff who notice something undesirable with hardware or a component and automatically by event monitoring tools already discussed in Event Management. (ITIL® V3 Service Operation 2007: 46.)

For a service operation to run well, Incident Management is invaluable and is generally among the first processes to be implemented in ITSM projects. (ITIL® V3 Service Operation 2007: 46.)

2.5.1.3 Request Fulfilment

Process handling service requests is called Request Fulfilment. Service request is a generic description for a multitude of different types of requests sent to the IT Department by their users. Generally they are small changes such as requests to change a password. As they are by nature low risk, frequent and generally low cost, it is better to have a separate process for handling them rather than overcrowding the change and incident management processes. (ITIL® V3 Service Operation 2007: 55.)

Service Requests can and should be planned in an organization so there would be a separate work stream and records for them in place. As service requests are changes, although minor ones, it is necessary to separate between the kinds of requests handled through request fulfilment and through change management (ITIL® V3 Service Operation 2007: 56.)

2.5.1.4 Problem Management

ITIL® makes a clear difference between an incident and a problem. While an incident is a single disruptive event, problem is the unknown root cause of one or more incidents. Problem Management then is the process diagnosing the root causes behind incidents and finding a resolution to them. It is then also responsible of implementing the resolution through appropriate control procedures e.g. Change Management and Release Management. (ITIL® V3 Service Operation 2007: 58.)

Problem Management can be divided into two categories: Reactive and Proactive Problem Management. Problem Management is reactive when handled through the Problem Management process in Service Operation. Proactive problem management takes place in Continual Service Improvement. (ITIL® V3 Service Operation 2007: 59.)

One of the more important aspects of technology in Problem Management is the capability to create problems from incidents. In many cases problems are unique as opposed to incidents that are recurring. The ability to create a problem from an incident and establishing a link between them helps in finding the underlying root-causes behind incidents. (ITIL® V3 Service Operation 2007: 59.)

2.5.1.5 Access Management

Access Management is a process handling access rights in the service, granting access for authorized users and denying access for from non-authorized users. The purpose is to execute the policies defined in Security and Availability Management. Access Management is the process that allows access to services. However it does not guarantee the availability of the service. (ITIL® V3 Service Operation 2007: 68.)

2.6 Continual Service Improvement

An organization first identifies its services, then designs, and implements them in the next stages of the lifecycles. After the services go live they still need a great deal of work, it's not enough that they are running; they also have to be made to run better. While the services are running, they should be constantly monitored and measured. The data received should be used to improve the current processes and new processes. This is where Continual Service Improvement comes into play. In order to achieve this, a conscious decision needs to be made to adopt CSI with clearly defined goals. It has to be embedded within the organization's culture. (ITIL® V3 Continual Service Improvement 2007: 3.)

The purpose of CSI is to continually adapt IT services to the changing business needs by identifying and implementing improvements. All this is done through the different phases of the lifecycle. In short, it is about looking for a way to improve process effectiveness and efficiency, and cost effectiveness. (ITIL® V3 Continual Service Improvement 2007: 14.)

ITSM processes have to be implemented, managed and supported with clear goals and objectives, and relevant measurements in mind. If this is not the case the business will

suffer. It is hard to improve something that is not fully understood. These are the reasons why it is important to understand what to measure, why it is measured and to define a successful outcome. (ITIL® V3 Continual Service Improvement 2007: 14.)

Continual Service Improvement objectives should include reviewing and analyzing each lifecycle phases and making recommendations on improvement opportunities and reviewing and analyzing Service Level Achievement results, improving the IT service quality and the efficiency and effectiveness of the ITSM processes as well as the cost effectiveness of delivering IT services. (ITIL® V3 Continual Service Improvement 2007: 14.)

The approach for CSI can be summarized in these six questions or steps:

- What is the vision? Understanding the vision and high-level business objectives is vital. This leads then to understanding how vision relates to business and IT strategies.
- Where are we now? Current situation needs to be assessed. Understanding where the organization is now provides a baseline for improvements.
- Where do we want to be? Have specific goals and a manageable timeframe. Measurable targets are needed to have successful improvements.
- How do we get there? A plan should be made for CSI to achieve higher quality services by implementing ITSM processes.
- Did we get there? Measurements and metrics have to be in place to ensure the milestones were achieved.
- How do we keep the momentum going? The culture of CSI needs to be embedded in the organization. This will assure the momentum for quality improvement is maintained. (ITIL® V3 Continual Service Improvement 2007: 15.)

The 7-Step Improvement Process is a CSI process introduced in ITIL® Continual Service Improvement book. Measurement is fundamental in CSI. The 7-Step Improvement process opens up the questions of what to measure and where to find the information. Appendix 4 introduces the 7-Step Improvement process. (ITIL® V3 Continual Service Improvement 2007: 43.)

It is important to provide improvement opportunities throughout the entire service lifecycle. By focusing on one part of the lifecycle, it will ignore the mistakes made in the other parts. It is possible for problems to have started already in Service Strategy or Service Design, but manifest themselves in Service Operation. If CSI only focuses on Service Operation, it will merely treat the problem, not solve it. This is why CSI will need to take a wider view. It brings greater value to business by covering the entire lifecycle. (ITIL® V3 Continual Service Improvement 2007: 21.)

Continual Service Improvement can be done with a wide variety of methods that range from 'soft and vague' to 'factual and scientific' as ITIL® puts it. These can provide results that are quantitative or qualitative or a mixture of both. To ensure consistency in measurement and in results the activities of gathering and processing data and the techniques and method that are used should be documented properly. CSI relies heavily on the activities of all other service management processes. An organization should not overlook the value of processes such as Incident Management and the data it can provide. (ITIL® V3 Continual Service Improvement 2007: 95.)

2.7 Summary

This section briefly introduced the basic theory and all of the processes included in ITIL® V3. This information helps understand the technical requirements introduced in the next section. It is easier to understand the technical requirements if the reader is familiar with the processes and essential terminology.

When the processes are well defined, also the selecting, implementing and using the tool will be easier and faster. The organizations should pay attention to their processes and make sure they just do not acquire a tool to fix the problems. The processes must be defined prior to selecting the tool to ensure that the requirements for the tool are clear.

The following section introduces the requirements for the ITSM tools stated in ITIL® V3. To get the benefits from the tool the processes must be clear and the tool acquired to support these processes, not the other way round.

3 Technology for IT Service Management

ITSM software tools have expanded from simple solutions focusing only on singular processes or functions e.g. service desk to complete integrated suites. These tools are now more like Enterprise Resource Planning (ERP) systems for IT. (ITIL® V3 Continual Service Improvement 2007: 145.)

Service management tools are important, but the basis for service management is created with good people, process descriptions and procedures. The need for the tools required by organizations depend on the business need for IT services and the size of the organization. Small organizations may be able to run small in-house developed database solutions logging and controlling incidents whereas large organizations may need sophisticated, distributed and integrated service management solutions linking all processes with system management toolsets. (ITIL® V3 Continual Service Improvement 2007: 145.)

In today's IT dependent organization, tools can be important assets, but they are still just tools, i.e. means to achieve something. The unique need for management information should be the starting point in selecting tools. Looking at how the current processes work should be looked at while implementing the service management processes. All this will then help in defining the specifications for the tools the organization needs. (ITIL® V3 Continual Service Improvement 2007: 145.)

A wide selection of tools exists currently ranging from tools supporting the core ITSM processes to tools supporting IT governance as a whole. To get the needed business intelligence required to improve IT service provision, the information from both of these toolsets needs to be combined and analyzed. (ITIL® V3 Continual Service Improvement 2007: 145.)

This section discusses the evaluation of service management technologies, their deployment and implementation and the different types of technology supports needed for the different phases of the lifecycle and what needs to be considered in these parts of the lifecycle from a technological aspect.

3.1 Evaluation of Service Management Technology Requirements

Tools enable the processes to work more effectively and increase efficiency and effectiveness in the organization, as well. With well-designed tools the management of

information is more efficient and the weak areas are easier to identify. This leads to cost savings and increased productivity, which in turn can lead to increased quality of the IT services. The benefits of the use of tools are centralization, automation and integration of the key processes in Service Management. The raw data can be analyzed, which provides the ability to identify trends and allows the implementation of preventative measures. (ITIL® V3 Service Design 2007: 203.)

Organizations should consider the following features when evaluating Service Management tools:

- The structure, handling and integration of data
- Integration capabilities for multi-vendor infrastructure components. Is it possible to integrate new components in the future?
- Conformability to international open standards
- Flexibility of the implementation, usage and data sharing
- User interface – usability experiences
- Monitoring capabilities for service levels
- Centralized shared database and distributed clients
- Requirements for converting previously collected data
- Backup, control and security capabilities for data
- Vendor's ability to provide support
- Scalability of the tool. (ITIL® V3 Service Design 2007: 203.)

It is important to consider the requirements for the tool. The requirements should be divided into mandatory and desired requirements. The modification of the tool should be minimized to gain faster and more efficient results. Therefore the general guideline is to choose a tool that supports the processes, not the other way round. The organizations should select a tool that is fully integrated and underpins most of the Service Management processes introduced in section 2. This, however, is not mandatory if the requirements for the tool are much lower. If the organization decides to choose many separate tools to fit all necessary processes, the consideration should be given to the interfaces between these tools. During the selection process, it is

important to have a Statement of Requirements (SoR) where the tool requirements are listed and categorized using the MoSCoW analysis:

- M – MUST have this
- S – SHOULD have this if at all possible
- C – COULD have this if it does not affect anything else
- W – WON'T have this time but WOULD like in the future. (ITIL® V3 Service Design 2007: 203.)

It must be noted that a 100% fit to requirements should not be expected. The 80/20 – rule should be applied to look for a tool that meets 80% or more of the requirements. However, the tool must meet the mandatory requirements or otherwise the tool should be rejected. In some cases, it is impossible to find a tool to meet all the mandatory requirements or even provide an 80% match. In these situations the organization should choose a tool with the best functional design and customize the unsuitable elements in co-operation with the vendor. It must be kept in mind that customization usually increases the costs of the implementation. Some tools include user hooks that allow access to site-written code at key procedural points, which eases the customization process. In these situations the whole package does not need modification. (ITIL® V3 Service Design 2007: 204.)

It is important that the tool has flexible abilities to determine access rights. The tool should be able to fit the organization's requirements and be able to determine who is permitted to access what data and for what purpose. (ITIL® V3 Service Design 2007: 203.)

It is also important to give consideration to the platform on which the tool will operate. The reason for this is that there may be restrictions laid down by the IT strategy and it might restrict which products could be included in the evaluating process. The procurement must fit within existing approved budgets. (ITIL® V3 Service Design 2007: 203.)

Since there are many Service Management tools available, it is important to think about the credibility of the vendor and tool. As obvious as it might be, it is important to be sure that the tool vendor is still supporting the tool after a year's time. The past record of the supplier and the tool needs to be considered. (ITIL® V3 Service Design 2007: 203.)

It is important to assess the training needs of the organization and evaluate the supplier's capability to provide training and support. The organization should consider training costs, training location, time required and how soon after the training the tool will be in use. Interfaces with other tools need to be formed and the functioning tested before going into live operation. (ITIL® V3 Service Design 2007: 204.)

After the hardware platform has been prepared and the software installed, data population needs to be considered. This is the point where the implementation process actually starts. It needs to be considered what, where from, how and when the implementation is done. It needs to be ensured that the resources are available during the implementation process. Timing is also important to avoid implementing during a known busy period. (ITIL® V3 Service Design 2007: 204.)

Software as a Service (SaaS) products ease the implementation process in many ways. Hardware and software are not required, which simplifies the process. SaaS products still require planning and implementation, but it should be faster and simpler. Managed service providers and Application Service Providers (ASP) provide almost the same functionality. The organization should consider which option is the best for their operation environment. (ITIL® V3 Service Design 2007: 204.)

Regardless of the type or tool that is selected, the fulfilment of the requirements can be divided between out-of-the-box solution, configurable solution and customizable solution. When the solution is an *out-of-the-box* solution, all the requirements are fulfilled. A *Configurable* solution needs to be configured to meet the requirements. A *Customizable* solution needs to be customized and reprogrammed to meet the organization's requirements. In most cases the configurations will stay in place over product updates, but customizations usually need to be repeated on every update, which increases working hours and costs. Therefore customization should be avoided as much as possible. It is also possible that if the tool is highly customized the vendors may be unwilling to provide support over the years. In the worst case the customization may release the vendor from much of their support obligations, which may result in a situation where the organization's Service Management system is unavailable because the vendor is not obligated to provide consultation and help. Also the training costs are more likely to increase when the vendor has to provide modified training. In these cases the basic training courses, that the vendor usually provides, become in most cases useless. (ITIL® V3 Service Design 2007: 204.)

The evaluation process aims to identify the requirements before identifying products. This however may change, because when evaluating tools, new options are introduced and the requirements may change. As mentioned earlier, a clear Statement of Requirements (SoR) should be produced to identify the business requirements and mandatory facilities. Also the policies and standards need identification. The benefits and results achieved will be far greater if the tool is selected to support the processes. The following issues need to be considered during the selection process:

- All functional and technical requirements should have an 80% fit
- Mandatory requirements are met
- As little customization as possible
- The level of Service Management's best practices used in the tool and by supplier
- Data structure and handling
- Integration with other tools
- Support level for open standards and interfaces
- The solution should be business-driven rather than technology-driven
- Administration and maintenance costs
- Maintenance and release policies within acceptable levels
- Security and integrity
- The level of training and consultancy available
- Good reporting tools
- Scalability and growth. (ITIL® V3 Service Design 2007: 205.)

3.2 Planning and Implementing Service Management Technologies

Organizations need to plan and prepare the acquisition, implementation and deployment of ITSM technologies. There are certain factors that need to be taken into consideration. These topics need a great deal of consideration and attention for a successful implementation of the project.

3.2.1 Licenses

User licenses will be a large part of the overall cost of ITSM tools in the organization. This is especially the case in the integrated ITSM toolsets that include several modules. The purpose and functionality of each module has to be well understood as well as how many licenses need to be acquired for each module. There are different types of licenses sold for each product. While the terminology may change, the basic idea of the license is the same. (ITIL® V3 Service Operation 2007: 166.)

Dedicated licenses are for users that require frequent use of the module. An example of this can be Service Desk staff using the Incident Management module. (ITIL® V3 Service Operation 2007: 166.)

Shared licenses are for users who use the module fairly regularly, but with noticeable intervals. These licenses generally cost more than dedicated licenses, but the overall cost is lower as more users are sharing the license and fewer licenses are needed in total. (ITIL® V3 Service Operation 2007: 167.)

Web licenses or some form of 'light interface' can be offered for people who need to use a small subsection of the software or only need occasional access. (ITIL® V3 Service Operation 2007: 167.)

One possible solution is also IT suppliers providing applications 'on demand'. In this case, access is given to the application for a period of time and severed when it is not needed anymore. It is then charged based on the time spent using the application. This sort of solution could be attractive to smaller organizations or for a very specialized product used relatively infrequently. (ITIL® V3 Service Operation 2007: 167.)

It has to be well understood in the organization that a full investigation of the licensing structure of the product has to be completed during the acquisition of the product and well before the deployment so that the costs of these tools will not come as any sort of surprise. (ITIL® V3 Service Operation 2007: 167.)

3.2.2 Deployment

The deployment of ITSM tools needs careful planning and execution and it should be formally handled through Release and Deployment Management, introduced in section 2.5.1.4. Some of these tools, for example Discovery and Event Monitoring tools, require some kind of client/agent software deploying it to the needed locations before

they can be used. Where network deployment is possible, it will need careful scheduling and testing and records maintained throughout the rollout for support staff to know what devices have been upgraded and what not. CMS should be updated as the rollout progresses. Devices often need to be rebooted for new software to be detected and it needs to be arranged in advance to avoid problems related to it. (ITIL® V3 Service Operation 2007: 167.)

3.2.3 Capacity Checks

Capacity Management is necessary before the rollout phase to make sure all devices have sufficient storage and processing capacity to host and run the software. Any devices that cannot do this will need upgrading or replacing. It needs to be established that the capacity of the network is sufficient to handle transmission of management information and log files and distribution of the clients, software and configuration files. (ITIL® V3 Service Operation 2007: 167.)

3.2.4 Timing of Technology Deployment

The tools need to be deployed at an appropriate time in relation to the organization's level of ITSM knowledge and sophistication. The tools should not be deployed too soon as they may hinder any development in the working practices or attitudes. A tool alone is not enough to improve things. (ITIL® V3 Service Operation 2007: 168.)

The processes the tool will be addressing need to be examined and it has to be made sure that the staff has accepted the new processes and way of working. While tools are not enough alone they do make things more tangible and in some cases the technical staff is able to see how the new processes work and how they can be improved. Some processes cannot be realized without tools so a balance has to be found that tools are introduced when they are needed. (ITIL® V3 Service Operation 2007: 168.)

Training is an important part of implementing the tool. It needs to be made sure training is provided at the right times. Training needs to be provided well in advance before the live deployment to familiarize the staff with the operation of the tools, but not too early or it is possible the needed knowledge is forgotten. Plans should be made for additional training in the future as needed. (ITIL® V3 Service Operation 2007: 168.)

3.2.5 Type of Introduction

There are different ways to introduce the technology to the organization. 'Big Bang' introduction will release it to all units at once whereas in phased approach units get the technology at different times. A generally phased approach is the solution for any organization, as they need to keep their services running while introducing new technologies. In many cases an older tool will be replaced with a new one. Plans for this need to be made for example to decide what kind of data needs to be carried forward from the old tool to the new one. There is a more thorough explanation of this in the ITIL® Service Transition publication on the Release and Deployment Management process. The organization needs to understand what kind of introduction suits them and a clear decision needs to be made during the planning phase. (ITIL® V3 Service Operation 2007: 168.)

3.3 Technological Aspects of Service Strategy

Service Strategy benefits from a balanced relationship between social and technical systems. Technology cannot solve all problems alone and human resources are limited, as well. A balance where technology supports the everyday operations of the company should be found to gain full potential from people and tools. Collaboration tools can increase the effectiveness of knowledge sharing. The automation of routines can reduce the cost of operations from high cost of personnel. Analytical modeling and simulation can be used to analyze the impact of strategies and operations. (ITIL® V3 Service Strategy 2007: 181.)

This section discusses ways to support service management using different technological advancements and working methods.

3.3.1 Service Automation

Automation is a way to increase the performance of service assets such as management, organization, people, processes, knowledge and information. Advances in technology have improved the capabilities in software agents to handle different tasks and interactions. Applications by themselves are means of automation, but also when they are shared between process assets and people they can be improved. (ITIL® V3 Service Strategy 2007: 182.)

Automation can improve the utility and warranty of services. The advantages can come in many forms. Adjusting the capacity of resources through automation is easier and faster in response to variations in demand volumes. Automated resources can be used

to serve without restrictions on time. Difficult optimization problems require computing power that is beyond human capabilities. Automation is also a way to obtain data and knowledge through monitoring the systems. (ITIL® V3 Service Strategy 2007: 182.)

Rigorously applied automation of service processes will improve the quality of services and reduce costs and risks by reducing complexity and uncertainty in providing them. (ITIL® V3 Service Strategy 2007: 182.)

While applying automation can bring great benefits, it can also make existing problems bigger or create more problems. ITIL® lists a set of guidelines that should be kept in mind while planning automation. (ITIL® V3 Service Strategy 2007: 182.)

Service processes should be simplified before automating them. Simplifying the process will reduce variance in performance. There are limits to how much it can be simplified and reducing necessary information or interactions will make the process less useful. At first only routine tasks and interactions should be automated. Complicated and infrequent activities are harder to automate than those with clear recurring patterns. (ITIL® V3 Service Strategy 2007: 182.)

The flow of activities, allocation of tasks, need for information and interactions need to be clear. All service agents need to understand what they need to do to make the service transactions available and complete. (ITIL® V3 Service Strategy 2007: 182.)

Self-service situations need minimal contact between the user and the underlying systems and processes. Needless interactions and information can create difficulties for users using the service. The interface should allow users to see only what brings value to them. (ITIL® V3 Service Strategy 2007: 182.)

3.3.2 Service Analytics and Instrumentation

Difference between data, information and knowledge has to be understood to be able to realize the benefits of service management. ITIL® presents the relationship in DIKW hierarchy: Data, information, knowledge and wisdom. Service Analytics is about creating knowledge and understanding to support service management. (ITIL® V3 Service Strategy 2007: 183.)

Data is an important resource for organizations. It is obtained through instrumentation, techniques and technologies monitoring the behavior of infrastructure. This however is not enough while monitoring services. This raw data that instrumentation produces does not explain anything about services, but has to be put in a greater context to

understand its value. Being able to understand the relationships between pieces of data produces information. Information is meant to answer the questions: Who, What, When and Where? Information is important, but is not enough to explain why certain data is the way it is and how it will be likely to change in the future. Information is still limited in the level of infrastructure however and for a service to gain the benefits of this information it needs to be placed in even greater context. This is creating knowledge from information. (ITIL® V3 Service Strategy 2007: 184.)

Service Analytics is used to model the existing infrastructure and support services to the higher-level business services. It is built on dependencies between the systems. Infrastructure events are tied with the corresponding business processes. This component-to-system-to-process linkage or Service Model allows identifying the business impact of an event. This supports the correction of problems from the user's point-of-view, but can also predict the impact of the changes on the environment. (ITIL® V3 Service Strategy 2007: 184.)

The current computer-based technology does not allow us to advance along the DIKW hierarchy any further. Wisdom requires people to provide understanding to answer the 'why' questions related to the services. (ITIL® V3 Service Strategy 2007: 185.)

3.3.3 Service Interface

Service interface is an important aspect in service management. A well-designed service interface is necessary for service orientation and can enhance the user experience of the service. Service interfaces are present in service access points. User interfaces include interfaces for customer, other agents and process-to-process interfaces. There are basic requirements for interfaces as they should have to meet the warranty. Some of these designing features include flexibility in the forms of media it is provided, ubiquity or easy location and capacity to support concurrent users. (ITIL® V3 Service Strategy 2007: 185.)

Service encounters come in many forms. This is why emphasis has to be placed on designing the interface. ITIL® lists five different kinds of service encounters, of which four require customer interacting with technology. The first encounter is *technology-free*, meaning there is no technology involved in the service encounter. (ITIL® V3 Service Strategy 2007: 186.)

Technology-assisted encounter is a meeting in-person, but this time the service provider is using technology. *Technology-facilitated* encounter requires that the

customer and service provider have access to the same technology. *Technology-meditated* encounter is a long distance encounter conducted through a phone, videoconference system or something similar. *Technology-generated* service encounter is the last one. The customer only interacts with the technology; an example of this is Internet services. (ITIL® V3 Service Strategy 2007: 186.)

Attention has to be paid on customer assets while designing the interface. The customer's background, perceptions and expectations, even the implications of the technology encounter for the customer have to be considered. Each of these encounters has advantages and shortfalls. However increasing the technology in the service encounter will reduce the complexity in it. (ITIL® V3 Service Strategy 2007: 186.)

3.3.3.1 Self-Service Channels

Self-service channels are increasingly popular among users used to interacting with computers. This is how automation can supplement the capacity of services. Internet with web browsers as the access point provides an excellent channel for service delivery. Advancements in technology such as artificial intelligence provide ever-increasing complexity for these encounters. (ITIL® V3 Service Strategy 2007: 186.)

The capacity for self-service channels has low marginal cost, offers consistent performance and without time restrictions. Lack of scheduling, low cost and lack of emotions in the interactions are among the things users also find positive about these channels. (ITIL® V3 Service Strategy 2007: 187.)

Appropriate knowledge and service logic should be included in the self-service terminal to make it effective. Using Case analysis is important in the designing phase to guarantee the usability efficiency and ease of interactions through the automated interface. Users have different levels of experience and skills that have an impact on how they will use the service interface and how they would like it to work. All these have to be taken into consideration while designing them. (ITIL® V3 Service Strategy 2007: 187.)

3.3.3.2 Technology-Mediated Service Recovery

Quicker service recovery can be obtained through an automated resolution of incidents and this is what customers generally expect from the service provider. This gives a reason to simplify, standardize and automate certain service activities and interactions.

Simple and routine incidents can be solved through automation. Poorly designed or implemented automation can, however, cause more problems. (ITIL® V3 Service Strategy 2007: 187.)

Several IT Service Management products in the market support the automation of incident and problem discovery and resolution. A service or component outage generates an alert automatically triggering diagnosis and repair procedures which then attempt to identify the root cause and resolve the issue using preprogrammed and scripted techniques. (ITIL® V3 Continual Service Improvement 2007: 147.)

3.3.4 Tools for Service Strategy

This section introduces tools for Service Strategy, such as simulation and analytical models and tools that assist in project and portfolio management and Financial Management.

3.3.4.1 Simulation

Long-term behavior can be very different from short-term behavior in IT organizations. A large number of agents interacting overtime can produce counterintuitive behavior. System Dynamics, as it is called in ITIL®, is a methodology for understanding and managing complex problems in IT organizations. It provides the means to capture and model feedback processes, time delays and other sources of complexity in IT organizations. It is a tool used to evaluate the consequences of new policies and structures prior to implementing them. Mathematical models and computer simulations are used to provide this management 'flight simulator'. It can provide useful insight for decision makers facing complexity and policy resistance. (ITIL® V3 Service Strategy 2007: 188)

3.3.4.2 Analytical Models

In situations where complexity is manageable, analytical models are very useful tools. Analytical models to be developed need to have enough clarity on the problem. The cause and effect relationships need to be clear and patterns recognizable. They also require enough historical information for assumptions on variables e.g. costs and processing times. (ITIL® V3 Service Strategy 2007: 188.)

The Service Desk can be used as an example of the use of analytical models. It can be seen as a system of queues. Gathering data on the rate of the arrival of requests, average processing time and how many of them are still waiting to be handled will give

enough information for simple analytical models. Analytical modeling should be started from the simple and then progressively advance towards more complicated ones that reflect the reality better. (ITIL® V3 Service Strategy 2007: 189.)

A wide variety of tools can be used to support decision making in Service Strategy. Decision trees, payoff matrices, linear programming and integer programming and network flow models are among many of the mathematical models and tools that are commonly used. The areas where these can be used to advantage include allocation resources, analysis of demand patterns, scheduling of jobs and tasks and many more. (ITIL® V3 Service Strategy 2007: 189.)

Service Strategy and other phases of Service Lifecycle can benefit from the knowledge obtained using analytical models to improve performance. Other frameworks such as Six Sigma and PRINCE2 offer methods based on analytical models and they can be adopted to support service management. (ITIL® V3 Service Strategy 2007: 190.)

3.3.5 Project and Portfolio Management

Project and portfolio management tools are generally used to manage business-related aspects of IT. These include registration, decision support, resource management, costing, portfolio management and project management of new business functionalities and the service and systems that underpin them. Integration with other tools includes capturing resource data from ITSM, resource utilization data to Financial Management, change and release build information based on the agreed portfolio and task assignments for development activities. (ITIL® V3 Continual Service Improvement 2007: 149.)

3.3.6 Financial Management

Financial Management is a critical component of IT service management. It is needed to provide a balanced budget and financial resources to maintain and develop the IT infrastructure and professional capabilities in support of the current and future needs of the business. What it means, in an increasing amount of IT organizations, is keeping track of resources and service utilization for the purpose of billing and chargeback of the shared IT resources. The measurement of costing and resource consumption to effectively and accurately charge the business customer becomes critical. Tools supporting this should collect raw metering data from different sources associating this usage to users of the services. This usage data is linked to costing information from accounting software and also reported and analyzed enabling customers to review the

information. An interface should exist to CMS to manage costs of each CI and resources to generate billing, reporting, chargeback and cost analysis. (ITIL® V3 Continual Service Improvement 2007: 149.)

Effective cost management is important for IT organizations. Financial Management tools have to accurately budget for IT and evaluate the overall effectiveness of the services provision and to ensure customers understand the IT costs of their business operations. (ITIL® V3 Continual Service Improvement 2007: 150.)

3.4 Technology to Support Service Design

There are various tools for Service Design and these tools include hardware, software, environmental, process and data design. These tools speed up the design process and ensure that standards and conventions are followed. These tools offer, for example, prototyping, modeling and simulation possibilities with proactive scenarios for "What if?" situations. These tools also ensure that designs are validated, interfaces and dependencies are checked and the designs fulfil their intended requirements before they are developed and implemented for live operation. (ITIL® V3 Service Design 2007: 201.)

The use of tools, that provides graphical views of the service and its constituent components, simplifies the Service Design developing process. These components include information about business processes, Service Level Agreements (SLAs), Operational Level Agreements (OLAs), environment, data and applications, teams, contracts and suppliers. These tools are often referred to as Configuration Management tools that are an element of Business Service Management tools. Auto-discovery tools and mechanism are useful for determining the relationships between these elements. They should have the ability to represent information graphically with the ability to drill down within each component and obtain detailed and accurate information when needed. (ITIL® V3 Service Design 2007: 201.)

The services can be monitored and managed through all stages of the lifecycle if the tools also contain financial information and are linked to a metrics tree providing Key Performance Indicators (KPIs) and metrics of the various aspects of the service. This allows everyone in the service provider organization to have access to a single, consistent, real-world view of the service and its performance. It is then easier to manage and develop the relationships between the service provider and its customers. (ITIL® V3 Service Design 2007: 201.)

These types of tools also support and assist the management of all stages of the Service Lifecycle with all aspects of the service and its performance. These stages include service achievement, Service Level Agreement, Operational Level Agreement, contractual and supplier measurement, reporting and management. The tool should include consistent and consolidated views from processes, systems, technologies and groups. Also the relationships and integration between IT services, systems and processes and the business processes need to be viewed. Accurate information and analysis for informed decision-making should be enabled through intelligent search and reporting facilities. The tool should provide management of service costs, relationships, interfaces and interdependencies, Service Portfolio and Service Catalogue. The Configuration Management System (CMS) and Service Knowledge Management System (SKMS) are vital elements for the tools helping in Service Design stage. (ITIL® V3 Service Design 2007: 201.)

To be able to implement such an approach successfully there are some generic activities to take into account. A generic lifecycle for IT assets should be established. This lifecycle contains stages such as requirements, design and develop, build, test, deploy, operate and optimize and dispose. Also principal processes, policies, activities and technologies should be defined within each stage of the lifecycle for each type of asset. The relationships between different types of IT assets, IT asset acquisitions and management and other IT disciplines should be formalized. It is also important to define all the roles and responsibilities involved within these IT asset activities. Measures for understanding the Total Cost of Ownership of a specific IT service should be established among the policies for the re-use of IT assets. A strategy for the acquisition and management of IT assets should be defined to determine how it should be aligned with other strategies. (ITIL® V3 Service Design 2007: 202.)

The following sections introduce additional requirements for the asset types of applications, data and information, IT infrastructure and environment, people and competencies as well as interfaces and dependencies.

3.4.1 Applications

First of all, a strategy should be defined for the acquisition and management of IT assets. This strategy includes the alignment with other IT and business strategies. The role of applications in the delivery of IT services needs to be documented and the generic IT asset lifecycle model should be adapted to an applications lifecycle. The

lifecycle needs to be tailored to different application types. Applications need different approaches in developing and therefore basic standards need to be applied and the role of development methodologies must be recognized. Ensuring that procedures are in place must be done in the early stages of the development. The most important requirements for applications are their operability, service performance, maintainability and security. Deciding the optimal delivery of applications needs also standards. It needs to be considered whether or not to use Application Service Providers, customized developments, Commercial off-the-shelf or package customization. (ITIL® V3 Service Design 2007: 202.)

3.4.2 Data and Information

The general principles of IT asset acquisition and management can ease the management of data and information. It needs to be ensured that data designs are designed in a way where the importance of standardized and re-usable metadata is taken into account. The quality and value of data to the organization needs to be recognized as well as the skills of data and database administration. The data view needs understanding in both the corporate subject area and from individual service point of view. Data needs to be managed also in non-traditional data types (text, scanned images, video and audio). The organization must also pay attention to the storage, security and legal issues for data. The generic IT assets lifecycle model should be adapted to the data asset type. (ITIL® V3 Service Design 2007: 202.)

3.4.3 IT Infrastructure and Environment

IT infrastructure and environmental equipment needs standards for acquisition and management. The IT infrastructure and environmental equipment includes power, hardware, O/S software, Database Management System software, middleware and networks. These should provide a stable and adaptable foundation, which underpins the provision of IT services to the business. The generic IT assets lifecycle model should be adapted to a specific IT infrastructure lifecycle. IT infrastructure assets need to be optimized through their re-usability and activities for this need to be established. In effective IT infrastructure, and services related to it, the need for tools is specified. The overall use and integration of the tools assists the management. (ITIL® V3 Service Design 2007: 202.)

3.4.4 People and Competencies

The competencies of individuals responsible for the IT assets and related services should be regarded and managed as an asset. The IT asset lifecycle's applicability to the assets of employees needs to be specified. These assets include competencies, such as, skill, knowledge, understanding, qualifications, experience, attitude and behavior. Documenting these competencies needs to be in place and their reusability or enhancement specified. Organization standards need to be compatible with existing standard competency frameworks (e.g. SFIA, Skills For the Information Age). These skills and competencies are divided into roles and responsibilities in the organization. (ITIL® V3 Service Design 2007: 202.)

3.4.5 Interfaces and Dependencies

Effective interfaces and dependencies require that the interfaces of the IT asset acquisition and management are defined, with IT-enabled Business Change, IT Project Management and IT Security. These interfaces need to be formalized also with functions and processes outside IT. Measurement and reporting should be formalized through identifying suitable metrics and reports on IT assets. Also quality control and measurement need to be in place. (ITIL® V3 Service Design: 203.)

3.5 Technology for Service Transition

Technology plays a major role in Service Transition. Technology should be designed and maintained in a way that maximizes the benefits from the technology. Service Transition is supported by technology either by enterprise-wide tools or by more specifically targeted tools. Enterprise-wide tools support wider systems and processes and more targeted tools support only Service Transition or parts of it. (ITIL® V3 Service Transition 2007: 193.)

Enterprise-wide tools provide automated support for some parts of the management in Service Transition. These tools are often called IT Service Management systems. These systems provide integration and linking capabilities for CMDB and other tools. ITSM systems also include management tools for managing system, network and applications and include dashboards and reporting tools. (ITIL® V3 Service Transition 2007: 193.)

More specified ITSM tools cover, for example, Service Knowledge Management System (SKMS), content management and workflow tools and data mining tools. These tools can also cover:

- Extract, load and transform data tools
- Measurement and reporting systems
- Test management and testing tools
- Database and test data management tools
- Copying and publishing tools
- Release and deployment technology
- Deployment and logistics systems and tools. (ITIL® V3 Service Transition 2007: 193.)

In addition, many support tools can assist change Management, Configuration Management and Release Management. These tools can include, for example, Configuration Management System (CMS), version control tools, distribution and installation tools, build and release tools, installation tools, discovery and audit tools, visualization, mapping and graphical representation tools and reporting tools to name a few. (ITIL® V3 Service Transition 2007: 193.)

3.5.1 Knowledge Management Tools

Knowledge Management tools ease the management of processing information and promulgating knowledge. These tools are used to set up the requirements of maintaining records and documents. Records differ from the documents by their behavior. Records are evidence of activities whereas documents are evidence of intentions. (ITIL® V3 Service Transition 2007: 193.)

Documents include policy statements, plans, procedures, SLA's and contracts. The management of documents and records defines the supporting capabilities of storage, protection, archiving, classification and retirement of documents and information or records. (ITIL® V3 Service Transition 2007: 193.)

Content management is the management of the storage, maintenance and retrieval of documents and information of a system of website where knowledge assets are represented in written words, figures, graphics and other forms of knowledge presentation. There are numerous knowledge services that support content management including web publishing tools, web conferencing, wikis, blogs, word processing, data and financial analysis, presentation tools, flow-charting, content

management systems, publication and distribution tools. (ITIL® V3 Service Transition 2007: 193.)

In practice these tools provide access to previous incident and problem cases with proven resolution data that can be utilized to enhance future incident or problem resolution. These tool needs to capture data throughout the Incident and Problem Management lifecycles to provide the necessary keywords and service relationships that can then be used. (ITIL® V3 Continual Service Improvement 2007: 148.)

3.5.2 Collaboration

Collaboration, as a means for working together and sharing tacit knowledge is vital for the organization. Collaboration helps the organization to accomplish stated goals and objectives. There are knowledge services that can improve the productivity and the collaboration. These services are as simple as shared calendars and tasks, threaded discussions, instant messaging, white boarding, video or teleconferencing and e-mail. (ITIL® V3 Service Transition 2007: 194.)

3.5.3 Communities

A good, increasingly popular, method for groups spread across time zones and countries to communicate, collaborate and share knowledge are communities. They are facilitated through an online medium such as intranet or extranet. Groups should have subject matter experts contributing and evaluating the knowledge assets within the community. Some examples are community portals and focus groups. (ITIL® V3 Service Transition 2007: 194.)

Communities are meant for members to contribute knowledge assets instead of keeping knowledge to themselves. One way to increase and support this is to provide some form of meaningful rewards for those whose contributions are deemed valuable by the community leaders and subject matter experts. (ITIL® V3 Service Transition 2007: 194.)

3.5.4 Workflow Management

Workflow management is an area of knowledge services. This is meant to provide systematic support for managing knowledge assets through a predefined workflow or process. Knowledge assets in many cases go through a workflow process that creates, modifies, augments, informs or approves aspects of the asset. ITIL® uses Request for Change (RFC) as an example in this. It is a knowledge asset that goes through a

workflow that creates it, modifies it, assesses it, estimates it, approves it and eventually deploys it. Workflow applications provide the infrastructure and support for these tasks. Typical workflow services include workflow design, routing objects, event services, gate keeping at authorization checkpoints and state transition services. (ITIL® V3 Service Transition 2007: 194.)

3.5.5 Configuration Management System

Large and complex Configuration Management Systems (CMS) are hard to operate without some software tool that is capable of supporting it. CMS should contain details about the attributes and the history of each CI and details of important relationships between CIs. Creating a fully automated CMS requires several tools to be integrated across different platforms. (ITIL® V3 Service Transition 2007: 194.)

Change Management should be the only channel to authorize changes to be made to IT infrastructure or service configuration baseline. All changes should be recorded to the CMS by the time they are made. Features that the CMS should have include security controls to limit access, hierarchical and networked relationships between CIs, easy addition and deletion of CIs and automatic validation of input data among others. A complete list of what ITIL® recommends can be found in the Service Transition publication. (ITIL® V3 Service Transition 2007: 195.)

Using the same tool to control all the stages of a lifecycle in the organization would be an ideal situation. In many cases it might not be possible however due to multiple platforms used in the organization. If this is the case the individual tools and solutions should be integrated to the main Service Management system or the Configuration Management System where integration proves to be beneficial. Otherwise the integration can be done at the procedural or data level. (ITIL® V3 Service Transition 2007: 195.)

Automated discovery and configuration audits increase the efficiency and effectiveness of Configuration Management. These tools determine what hardware and software is installed in the infrastructure and how applications are mapped to it. This allows greater coverage of audited CIs with the available resources. It also allows staff to focus on exceptions rather than doing the audits. (ITIL® V3 Service Transition 2007: 195)

3.6 Technology to Support Service Operation

As Service Operation is the day-to-day operation of the services, technology plays an important part in running them. Every process introduced in section 2 has a certain set of functionalities a technology supporting it should have. Most of the processes are supported in what is generally considered the core-module of integrated ITSM technology such as IT Service Management suites. The IT Service Management suite is introduced in 3.6.8. First this section introduces several functionalities that any ITSM tools should support, then the requirements the Service Operation processes have for tools. Followed by this, there is an introduction of the IT Service Management suite, a tool that can support a wide variety IT operations and a few more specialized tools supporting other areas of IT.

3.6.1 Core Functionalities of ITSM Technology

Integrated ITSM technology has processes handled as modules, but there is also a set of generic core functionalities that any technology should have. While these functionalities are found under Service Operation in ITIL®, they are not limited there, but apply in all stages of the lifecycle. These are very brief explanations of these functionalities, but there is discussion and references to these technologies under almost all of the processes. (ITIL® V3 Service Operation 2007: 157.)

3.6.1.1 Self-Help

A web interface is needed in ITSM tools allowing end users to access certain functionalities themselves. This would have a direct interface with the back-end process-handling software to automate simple requests e.g. service requests and incident reports sent by the users. Section 3.3.3.1 discusses self-service channels in ITSM technology. (ITIL® V3 Service Operation 2007: 157.)

Self-help functionality is a cost effective way to provide users assistance to resolve their own difficulties. This could be a web interface that includes items such as Frequently Asked Questions (FAQs), 'how to do' search capabilities to guide users through context sensitive list of tasks and activities, bulletin-type service containing details of service issues, automated password change capabilities and software fix downloads among others. This should also include a capability for users to log incidents themselves even during periods when the Service Desk is closed and possibly a simple Request Fulfilment capability to reduce the number of calls coming in to service desk. (ITIL® V3 Service Operation 2007: 161.)

3.6.1.2 Workflow or Process Engine

Workflow engine, introduced in section 3.5.4, is needed in ITSM tools to pre-define and control processes such as Incident lifecycle, Request Fulfilment lifecycle and others. This would allow relationships, alerting, escalation, activities and so on to be automatically managed. (ITIL® V3 Service Operation 2007: 157.) This supports the process preventing any incident from being overlooked or delayed. Target times need to be agreed and included in the tool to support the workflow control escalation path. (ITIL® V3 Service Operation 2007: 159.)

3.6.1.3 Integrated Configuration Management System

Configuration Management System is for IT infrastructure assets, components, services and other configuration items, in short anything IT organizations deem worth controlling, held together with attributes in a centralized location allowing relationships between them to be stored and maintained. This should be linked to incident, problem, known error and change databases. A more complete discussion on CMS is found in 3.5.5. (ITIL® V3 Service Operation 2007: 157.)

3.6.1.4 Discovery / Deployment / Licensing Technology

Discovery or automated audit tools should be utilized to populate CMS and keeping it up-to-date and assist in License Management. These tools should be run in the network finding and recovering the information related to all components in the IT infrastructure. Some filtering capabilities should be implemented in the technology allowing only required data to be extracted, such as changes since the last update. It is possible to use the same technology in deploying new software or updates and patches to targeted locations. (ITIL® V3 Service Operation 2007: 157.)

3.6.1.5 Remote Control

Giving the Service Desk the ability to take control of the user's desktop allowing them to correct settings or investigate the problem would be helpful for support groups. Facilities and proper security controls will be needed to allow this. (ITIL® V3 Service Operation 2007: 157.)

3.6.1.6 Diagnostic Utilities

Capabilities such as diagnostic scripts and other diagnostic utilities in the technology to assist in diagnosing the incidents are helpful for support groups and the Service Desk. Specialist support groups and suppliers are needed in development to provide details

of likely failures and key questions to identify what went wrong and for details of the resolution actions to be taken. (ITIL® V3 Service Operation 2007: 157.)

3.6.1.7 Business Intelligence and Reporting

The ITSM technology should incorporate good reporting capabilities in order to make the most out of the stored data. Standard interfaces ought to be used to input data to dashboards and industry-standard reports. Also instant onscreen and printed reporting should be provided. (ITIL® V3 Service Operation 2007: 157.)

A common repository of all service information and business-related data is needed like statistical analysis tools are for more technical data. These tools focus on providing business-related data from other toolsets to direct activities of IT as a whole to support the business. (ITIL® V3 Continual Service Improvement 2007: 150.)

3.6.1.8 Dashboards

A dashboard is a technology that allows visibility of the overall IT service performance, infrastructure and availability levels. It can give real-time information for users as well as be included in reports for customer and users. Having a capability to customize the view to match certain specific interests can be useful. (ITIL® V3 Service Operation 2007: 158.)

3.6.1.9 Known Error Database

A Known error database should store all details of previous incidents and problems and their resolutions to support faster diagnosis and resolutions of future incidents and problems. This should include a functionality to categorize and retrieve previous known errors using pattern matching and key word searching against symptoms. (ITIL® V3 Service Operation 2007: 160.)

3.6.1.10 Integration with Business Service Management

It can be very useful to integrate the business service tools with the IT Service Management tools to support the business functions in the organization. An interface is needed to give this function. This can be, for example, having customer-billing information linked to CMDB to support incident management. (ITIL® V3 Service Operation 2007: 158.)

Every process introduced here can have its own technology solution or they can be a part of the IT Service Management suite. The following are recommendations as to what the tool should have to support the operation for these processes.

3.6.2 Event Management

As already discussed under Event Management process, section 2.6.1.1, event management requires monitoring and control systems. Monitoring tools such as monitoring agents are needed to go through the most common environments and components in the network. Events in technology are status messages generated from these components. They are created when a tool discovers an error condition or a set threshold is met. The problem however is finding the important ones from a significant volume of these messages. (ITIL® V3 Service Operation 2007: 158.)

Open interface is needed to allow monitoring across the entire IT infrastructure in the organization and all services in use. It needs to support any standard event input and multiple alerting. There should be a centralized routing of all events to a single location. (ITIL® V3 Service Operation 2007: 158.)

Support for design and test phases is required with good reporting functionalities to allow feedback during these phases. A direct interface is needed to Incident Management process to allow the creation of incidents. (ITIL® Service Operation 2007: 158.)

3.6.3 Incident Management

The integrated ITSM technology needs to support Incident Management by allowing a self-help possibility to report incidents, Known Error database for quicker incident resolution and Workflow engine for automated escalation and target times. A direct interface with Event Management is needed for automated incident generation. (ITIL® V3 Service Operation 2007: 159.)

CMS should be integrated to the Incident Management technology to allow automated relationships made between incidents, service requests, problems, Known Error Database and other Configuration Items. (ITIL® V3 Service Operation 2007: 159.)

3.6.4 Service Request and Fulfilment

A Service Catalogue definition, request management and the workflow related to these activities can be done with specialized tools created for this purpose. They provide the technology required to define the services within the catalogue and to create a service portal allowing users to request services. The request is managed through the workflow engine completing the tasks and activities of the defined process for each request type. Cost information is captured and fed to financial system for later

charging activities. These kinds of tools help the integration of IT with the business streamlining the delivery of commodity services. (ITIL® V3 Continual Service Improvement 2007: 148.)

Technology supporting these functions needs to have easy-to-use self-help web interface to allow users to raise service requests. Direct references to incidents and events are needed if they initiate Service Requests. (ITIL® V3 Service Operation 2007: 159.)

This is generally very similar to the Incident Management process and Service Requests can be handled through the Incident Management workflow if the organization chooses to do so. However it can also be handled as a separate work stream. (ITIL® V3 Service Operation 2007: 159.)

3.6.5 Problem Management

ITSM technology needs to separate incidents from problems. However a direct link is required to allow the creation of a problem from incidents in a case. Like Incident Management process known error database and process flow engine are recommended. (ITIL® V3 Service Operation 2007: 160.)

CMS should be integrated so as to allow Problem Management to find the affected components and CIs and with Change Management allowing RFCs to be related to the problems they may have caused. This is to be able to evaluate the success of the Change Management process. (ITIL® V3 Service Operation 2007: 159.)

Good reporting functions are required for easy production of management reports allowing the incorporation of data directly without rekeying it. (ITIL® V3 Service Operation 2007: 159.)

3.6.6 Access Management

Technology Supporting Human Resource Management technology is needed to validate the user identities and tracking their status. (ITIL® V3 Service Operation 2007: 159.)

Directory Service technology is needed to enable assigning names to resources and then giving access to these sources based on the user profile. (ITIL® V3 Service Operation 2007: 159.)

Features to support Access Management in applications, operating systems and network operating systems are needed to allow Access Management to function in the organization. (ITIL® V3 Service Operation 2007: 159.)

Integration to Request Fulfilment and Change Management systems is needed to support the processes. (ITIL® V3 Service Operation 2007: 159.)

3.6.7 Service Desk

The Service Desk is an important function in Service Operation and in running the daily operation of the IT organization. It should be the single point of contact for IT users on a daily basis. It should handle all incident and service requests usually by using specialist software tools to log and manage all such events. (ITIL® V3 Service Operation 2007: 110.)

Tools are required for the supporting Service Desk staff to perform their roles as efficiently and effectively as possible. This section discusses these technologies briefly. (ITIL® V3 Service Operation 2007: 160.)

3.6.7.1 Telephony

A high number of incidents are likely to be raised through telephone calls and this means the Service Desk should have good modern telephony services. There should be an automated call distribution system that allows a single telephone number and group pick-up capabilities and Computer Technology Interface software to allow caller recognition and automated population of user's details into the incident record from CMS. VoIP technology can be used to lower telephony costs, especially with international users. Statistical software is needed to allow telephony statistics to be gathered. This data should include the number of the call received, call profiles and answer times, call abandon rates, handling rates by individual Service Desk call handles and average call durations. (ITIL® V3 Service Operation 2007: 160.)

3.6.7.2 Support Tools

The Service Desk should have certain support tools to help its operations. Most of these are included in all integrated ITSM toolsets with CMS at its core providing support for all ITIL® defined process. Other options include, if there is no need for full ITSM support, to utilize freestanding products in the market or possibly producing incident logging and management system in-house. (ITIL® V3 Service Operation 2007: 160.)

These tools should include functionalities such as known error database (3.6.1.9), diagnostic scripts (3.6.1.6), self-help web interface (3.6.1.1) and remote control

(3.6.5.1) to support the Service Desk functions. Many of these are explained under Core functionalities of ITSM tools. (ITIL® V3 Service Operation 2007: 160.)

The Service Operation covers also other functions outside the Service Desk. The following are some tools that can help support the general operational activities and functions of the IT. These tools support several processes outside the Service Operation phase, but are a part of running the daily operations of IT.

3.6.8 IT Service Management Suites

Tools compatible with the ITIL® process framework have risen alongside with the success of ITIL® within the industry and with the advancement of different technologies. These tools provide good integration between the processes and associated record types. These tools combine all previously introduced aspects in one integrated tool. (ITIL® V3 Continual Service Improvement 2007: 145.)

Incidents (3.6.3) related to the affected service or CI are important for service provision and support activities. They enable master record creation that can highlight common situations affecting the users and enhancing problem identification. Problems (3.6.5) have to be defined with integrated links to incidents that confirmed their existence. This creates a possibility to use configuration data from CMS to understand the relationships to support root cause analysis including change and release history of the affected service or CI. After a service failure changes are often the first area of investigation. The integrated ITSM tool makes it easier to trace the changes that have been made to a service or a CI. (ITIL® V3 Continual Service Improvement 2007: 145.)

Configuration Management System (3.6.1.4) is the foundation of integrated ITSM technology. Important functionalities are discovery and reconciliation capabilities to capture CIs, visualization of hierarchy and CI relationships, audit tools to streamline verification activities and the ability to combine data sources where appropriate. (ITIL® V3 Continual Service Improvement 2007: 146.)

Definitive libraries and integration to CMS also provide good support to coordinate Releases and manage their contents. They generally include support for Release records consolidating and containing Release contents with attachments such as related objects and documents. Integration provides links between the associated Change records that are a part of a Release and the related Incident, Problem or Service Request records. (ITIL® V3 Continual Service Improvement 2007: 147.)

ITSM tool suites also support Service Level Management functionality allowing linking of incidents, problems, changes and releases to associated Service Level Management records such as SLAs, OLAs and Underpinning Contracts. Automated monitoring of SLAs is possible with such tools. Many ITSM suites also provide the definition of the Service Portfolio and the Service Catalogue and management of the workflow related to the fulfilment of Service Requests. (ITIL® V3 Continual Service Improvement 2007: 147.)

Reporting (3.6.1.7) is one of the key benefits of an integrated ITSM suite. Integrated ITSM suites provide management information using the combined data from all areas of the service lifecycle and enabling analysis of the relationships between the service management events and the associated performance metric data. (ITIL® V3 Continual Service Improvement 2007: 147.)

3.6.9 Systems and Network Management

Tools used to administer various domains can also provide a wide variety of data to support the service management. It is possible for them to generate error messages for Event Management that feeds the Incident Management and Availability Management processes. This data can also be used for Capacity and Performance Management as the most accurate method for finding out the actual availability of components. (ITIL® V3 Continual Service Improvement 2007: 147.)

3.6.10 Security Management

Security tools are meant to support and protect the integrity of the network, systems and applications from intrusions and inappropriate access. All security related hardware and software should generate alerts triggering auto-generation of incidents through the normal processes. (ITIL® V3 Continual Service Improvement 2007: 149.)

3.7 Tools to Support Continual Service Improvement

Software tools supporting CSI activities need to support the monitoring and reporting on IT services. They should be used for data gathering, monitoring, analyzing and reporting for services and assisting in determining the efficiency and effectiveness of ITSM processes, possibly leading to an increased quality of the IT services. (ITIL® V3 Continual Service Improvement 2007: 145.)

For CSI to be effective in the organization the tools supporting it should be supporting the key operational activities of the 7-Step Improvement process: data gathering, data

processing, data analysis and presentation. (ITIL® V3 Continual Service Improvement 2007: 151.)

The following tools are introduced in various parts under the different parts of the lifecycle. These are recommendations and benefits that can be gained from the tools for Continual Service Improvement.

3.7.1 IT Service Management Suites

IT Service Management suites, which will be introduced in section 3.8.6, create a rich source of data and inputs for Continual Service Improvement due to covering so many different parts of the ITIL® lifecycle. Incidents and problems are prime input for CSI allowing better understanding of the issues affecting the overall service provision and support activities. The Configuration Management System (CMS) is an important data source for CSI activities. All these support CSI activities by providing the needed information. (ITIL® V3 Continual Service Improvement 2007: 145.)

3.7.2 Event Management

Section 3.6.2 introduced Event Management tools. The value these tools can bring to Continual Service Improvement is the data provided about availability impacts and performance thresholds. This is a cost-effective method to improve the reliability, effectiveness and efficiency of the IT infrastructure. (ITIL® V3 Continual Service Improvement 2007: 147.)

3.7.3 Automated Incident / Problem Resolution

Section 3.3.3.2 discussed Technology mediated service recovery. These tools document the information within the incident or problem record for future analysis and identification of proactive Continual Service Improvement opportunities. (ITIL® V3 Continual Service Improvement 2007: 147.)

3.7.4 Knowledge Management

Section 3.5.1 introduced Knowledge Management tools. These tools can also be used to generate data measuring the improvement process itself. CSI data provided by these tools includes incident recurrence and frequency, utilization rates and the effectiveness of stored results among others. (ITIL® V3 Continual Service Improvement 2007: 148.)

3.7.5 Service Request and Fulfilment (Service Catalogue and Workflow)

In 3.6.4 Service Request and Fulfilment tools were introduced. The benefit of these tools for Continual Service Improvement comes in the form of data collected from the requests and related to the quality of the delivered services. (ITIL® V3 Continual Service Improvement 2007: 148.)

3.7.6 Financial Management

Financial Management tools, introduced in 3.3.6, support effective cost management in the organization by accurately budgeting the IT and evaluating the overall effectiveness of the services provision. They are meant to ensure customers understand the IT costs of their business operations. All these help to support CSI in cost management and increase the value of IT to the business. (ITIL® V3 Continual Service Improvement 2007: 149.)

3.7.7 Performance Management

Performance management tools collect data related to availability, capacity and performance from the domains and platforms within the IT infrastructure environment. This data is used for Availability and Capacity Management Information Systems allowing IT organizations historical, current and future view of performance, resource and service usage. The tools can have a wide variety of capabilities such as trend analysis of future grown and required capacity, construction of performance and data usage profiles enabling comparison of actual utilization to planned models and generation of data required to report on SLAs and provide inputs to service improvement plans. Performance management tools support CSI through many aspects of performance management including capacity planning, feasibility analysis and ongoing monitoring of the IT service provision. (ITIL® V3 Continual Service Improvement 2007: 148.)

3.7.8 Application and Service Performance Monitoring

These tools provide capabilities for monitoring the end-to-end delivery of services to provide understanding of user experience related to service provision. Active and passive technologies are used to monitor the many components of the service delivery chain. Key metrics provided by this software include availability, transaction throughput and transaction response time among others. The data is used to analyze the delivery of services and look for potential improvements to streamline the delivery mechanisms. This can be used in Service Level Management to see the compliance to SLAs and find

possibilities for the service improvement process. (ITIL® V3 Continual Service Improvement 2007: 148.)

3.7.9 Software Version Control / Software Configuration Management

These tools are meant to provide a Definitive Media Library type repository for the development environment. This repository supports the control of all mainframe, open systems, network and applications software. All version information has to integrate with the CMS and Release Management. (ITIL® V3 Continual Service Improvement 2007: 149.)

3.7.10 Software Test Management

These tools support the testing activities of Release Management and deployment activities. These tools provide development, regression testing, user acceptance testing and pre-production Quality Assurance testing environments. They should be integrated with Incident Management to capture testing-related incidents that may have an effect on the production version. (ITIL® V3 Continual Service Improvement 2007: 149.)

3.7.11 Statistical Analysis Tools

Availability and Capacity Management require more robust reporting capabilities than the other elements of service management. These tools need to capture raw data from several tools into one single repository for collective analysis. The functionalities these tools need to provide include being able to logically group data, model current services and enable predictive models to support future service growth utilizing a wide selection of analysis techniques. (ITIL® V3 Continual Service Improvement 2007: 149.)

3.8 Summary

This section covered all the technological requirements stated in ITIL® V3. ITIL® discussed the technology from various perspectives from implementing the technology to evaluating the requirements for the service management technologies and the support the different phases of the lifecycle need and the advantages the tools can provide to them.

The most important aspects here for anyone looking for an IT Service Management tool is the MoSCoW analysis for technology requirements, introduced in section 3.1. The analysis is meant to help the organization understand what they need from the tool and know what kind of tool to look for.

During the planning and implementation of ITSM tools certain aspects such as licenses for the tools and the overall cost of the tools need to be considered along with how to deploy the tools and when and how the training should be done for the tools.

The different phases of the ITIL® lifecycle require different kinds of tools to support them. The tool that is capable of fulfilling most of these needs is the IT Service Management suite, but there are specialized tools for each if more thorough and complete support of a certain aspect is needed.

Table 1. Technological support for lifecycles

Service Strategy	Analyzes the impact of the future services and their financial performance. During the service strategy phase organizations also need to pay attention to how the services are used by customers.
Service Design	Ensures that designs are validated, interfaces and dependencies are checked and the designs fulfil their intended requirements before they are developed and implemented for live operation.
Service Transition	Provides automated support for parts of the management such as service deployment and reporting.
Service Operation	Makes sure that the services organization provides run smooth by helping to run the services, detect and fix incidents and problems and support the IT staff in their work.
Continual Service Improvement	Collects and analyzes data for possible improvements for services and the infrastructure.

4 Research and Certification on ITSM technology

This section introduces two assessment models for ITSM tools, PinkVERIFY™ and ITIL® Software Assessment Scheme. It also covers Gartner's 2010 Magic Quadrant for the IT Service Desk, a research about the biggest players in the ITSM tool market last year (2010).

4.1 PinkVERIFY™

PinkVERIFY™ is an ITIL® software tool assessment service developed by Pink Elephant. It assists the software vendors in developing and marketing tools that are able to support ITIL® terminology, processes, workflows and integration. From the software customer point of view the tool allows the customers to select enterprise software that supports ITIL® functionality and integration. (Pink Elephant. 2009.)

PinkVERIFY™ was developed in 1991 and in 1999 it entered the market as an assessment of Help Desk tools. The assessment criteria included Incident, Problem, Change and Configuration Management. These processes were selected due to a fact that only a few of the major service management suites had the ability to meet the requirements set for these processes. (Pink Elephant. 2009.)

The industry has aggressively moved forward and most of the tools and services meet the requirements set to Help Desk processes. Pink Elephant added more processes to the PinkVERIFY™ assessment for the vendors whose tools had expanded beyond the Help Desk processes. These extra processes included Availability, Release & Deployment and Service Level Management. The tool vendor was able to include one of the processes as a capability for their assessment. (Pink Elephant. 2009.)

In 2008 PinkVERIFY™ expanded their assessment criteria to reflect the industry growth and the evolution of the ITIL® V3 Service Lifecycle approach by including 14 ITIL® V3 processes. These processes included Incident, Problem, Event, Request Fulfilment, Change, Service Asset & Configuration, Knowledge, Service Portfolio, Service Level, Financial, Service Catalog, Availability, Capacity and Release & Deployment Management. (Pink Elephant. 2009.)

In November 2009, PinkVERIFY™ expanded their scope to include all requirements for the OGC ITIL® Software Assessment Scheme (ISS) and IT Service Continuity Management. The scope will continue to expand to include the remaining nine ITIL® V3 processes. (Pink Elephant. 2009.)

PinkVERIFY™ assesses tools according to process platform, core and integration criteria. The criteria align with ITIL® terminology, processes, workflows and integrations. PinkVERIFY™ assessment criteria are conducted from the tool requirements documented in ITIL® and other publications from the TSO, from practitioner and software vendor input, Pink Elephant's own consulting experience and OGC ISS criteria. PinkVERIFY™ allows the software vendors to indicate their tool's compatibility with ITIL®. (Pink Elephant. 2009.)

In September 2009, Pink Elephant was officially announced as a Licensed Software Assessor for APM Group's ITIL® Software Scheme (ISS). As a Licensed Software Assessor for ISS, Pink Elephant conducts software assessments where the criteria from PinkVERIFY™ and ISS are both included. The PinkVERIFY™ assessment includes additional criteria not covered by the ISS. This allows a vendor to display both the PinkVERIFY™ and the ITIL® swirl logo on its product packaging as long as it has met the criteria. (Pink Elephant. 2009.)

Pink Elephant lists all the tools that are successfully verified on their website. To meet the criteria, a specific version of a tool must pass the assessment and meet the platform, core and integration requirements for a specific process within the PinkVERIFY™ scope. (Pink Elephant. 2009.)

PinkVERIFY™'s markets can be separated into two distinct markets namely Software Vendor Community and Software Customer Community. The vendor community uses PinkVERIFY™ to differentiate themselves in the software markets. Appearing on the Pink Elephant's list offers an objective and independent validation of a tool's capability to support the ITIL® framework. Each tool, service and version needs to be assessed separately and the verification is only valid for the assessed version. The license agreements are valid for two years and after this they can be renewed if the vendor is willing to do so. (Pink Elephant. 2009.)

The customer community can use PinkVERIFY™ to identify the tools that support their needs as the PinkVERIFY™ lists the tools that are capable to support the ITIL® framework. Customers can also have a look at the requirements for the tools and learn what to look for when selecting an appropriate tool for their organization. PinkVERIFY™ assesses the tool's functional requirements and validates that the tool meets the ITIL® requirements. It needs to be notified that PinkVERIFY™ does not provide a maturity model for how well the product meets the requirements. In other

words the customer needs to examine the vendor in question to decide which tool their organization needs, a compact or more advanced one. (Pink Elephant. 2009.)

4.2 ITIL® Software Assessment Scheme

ITIL® Software Scheme was produced through the Office of Government Commerce by the APM Group as an alternative for PinkVERIFY™. PinkVERIFY™ is a commercial software accreditation scheme developed by Pink Elephant and it has been accepted as the de facto standard for ITSM toolsets. (Peter H.M. Brooks, 2009)

The ITIL® Software Scheme allows software tool vendors to obtain endorsement for their ITIL® based tool. Software tool vendors have to apply to have their tool assessed by licensed software assessors to obtain a recommendation for the tool. Licensed software assessors are independent entities that provide recommendations to the APM group. The tools are assessed by qualified industry experts who have met the criteria set by the APM Group. (Office of Government Commerce. 2011. The ITIL® Software Scheme.)

The tools are assessed and the results are divided to three levels: Bronze, Silver and Gold levels. Also 100% compliance to the ITIL® processes that the tool claims to be compliant with is assessed. The requirements for the three levels of assessment are the following:

- **Gold level**: The requirements are that the product, processes and user documentation has at least three in production customers that have implemented and are using the product and are happy to reference that they are using the tool to automate the assessed process in accordance with ITIL®. The gold level requires proof of customer implementation of the audited product from the customer endorsing their use of it with at least one piece of user evidence. The proof should state that they have the tool (including correct version) deployed in production and they are using the tool to automate the assessed process in accordance with ITIL®. (Office of Government Commerce. 2011. The ITIL® Software Scheme.)
- **Silver level**: The requirements are that the product, processes and user documentation has at least three in production customers. The silver level requires proof of product order by customer stating the tool (including correct version) is deployed in production. (Office of Government Commerce. 2011. The ITIL® Software Scheme.)

- **Bronze level**: The requirements are that the product, processes and user documentation has passed the assessment. (Office of Government Commerce. 2011. The ITIL® Software Scheme.)

Software tool vendors are allowed to hold a valid Trade Mark License and use the Process Compliant badge after the tool has been assessed and it has passed all the requirements. The ISS allows vendors to be recognized through a new logo, the ITIL® swirl logo. (Office of Government Commerce. 2011. The ITIL® Software Scheme.)

4.3 Gartner's 2010 Magic Quadrant for the IT Service Desk

Gartner, Inc. is an information technology research and advisory company located in Stamford, Connecticut, U.S.A.

Magic Quadrant for the IT service desk is a yearly research report from Gartner focusing on enterprise-class vendors of IT service desk tools and the service desk market in general. In order to be qualified for the research vendors need to meet the set criteria to prove themselves as enterprise-class vendors. In short the criterion comes down to the vendor's ability to fulfil the needs of an enterprise customer seeking a service desk solution. The features these solutions have to have to be included in Gartner's Magic Quadrant are incident management, problem management, service request management, self-service management, knowledge management, change management and service-level management. Other aspects that need to be fulfilled are that the product has to be running in production in enterprise environments of 4000 employees and that there is noticeable interest for the product confirmed by Gartner's client inquiry data. (Coyle et al. 2010.)

In this thesis, Gartner's Magic Quadrant for IT Service Desk was used in the selection process deciding which tools will be included. Nine tools were chosen for the interviews. Five of those products (BMC Software (Remedy), Service-now.com, HP, CA Technologies and IBM) are the biggest players in the world in this field and are also the highest ranked solutions in Gartner's research. They were chosen to represent the enterprise level solutions in the research. Out of the remaining products only one is included in the Gartner report namely Axios Systems that is considered a niche player. The other three products (Symantec/Altiris, Efecte and Requeste) are not included in the Gartner report.

Gartner's report evaluates the products from two perspectives. One is the ability to execute and the other completeness of vision. The ability to execute looks into the

product itself, customer experiences and the company producing it. Completeness of vision then covers areas including company's marketing, sales and product strategies, business model and innovation in the product. They both cover a wider variety of factors, although Gartner considers the ones mentioned here the most important. (Coyle et al. 2010.)

After the companies are analyzed according to these factors, they are placed in the Magic Quadrant (Figure below). In the 2010 Magic Quadrant we can see that BMC is the only software in the leader category or in the upper right-hand corner. Service-now.com is in the challenger category with CA Technologies and HP. IBM is in the niche player category, although very close to the challenger category. Axios Systems is very deep in the niche player category.

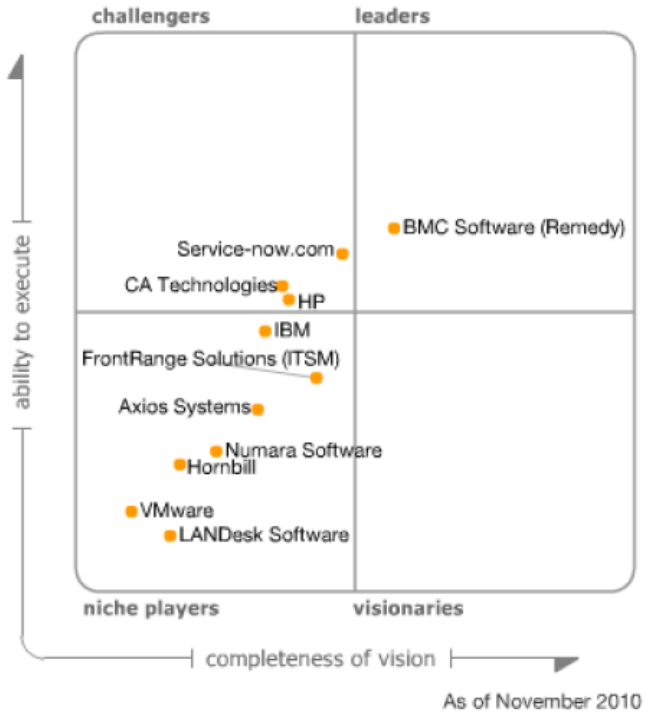

Figure 2. Magic Quadrant for IT Service Desk (Coyle et al. 2010.)

This picture gives a good idea what the biggest players in the IT service desk market are. Any company planning to get a new ITSM or a Service Desk solution can use it as a guideline. It has to be noted however that this only includes global players of this market and every market area has also its local players, companies with limited resources, but with products nonetheless worth a look. (Coyle et al. 2010.)

This report doesn't solely focus on the vendors and their products, but also takes a larger view on the service desk market. It highlights some of the current trends in the marketplace that will be briefly discussed here.

Tool acquisition and service desk business plan: Service desk tools are relatively expensive to acquire. However, proper understanding of the functionalities and improvements these tools can provide makes the costs easier to justify. (Coyle et al. 2010.)

SaaS versus on-premises life cycle licensing cost: Software as a Service is a rising trend in the service desk market, but the cost structure of it differs greatly from on-premises products and seems to be unclear for many customers. This needs to be understood and cost estimated correctly to find out the real differences between them. (Coyle et al. 2010.)

Process re-engineering projects: Out-of-the-box ITIL® processes are commonly adopted by IT organizations with a new tool. However the unique needs of every organization lead them to customize the processes suitable for them, which in turn may actually result in lack of real understanding and maturity of the processes. (Coyle et al. 2010.)

IT service support scope: An increasing number of IT organizations is starting to look at IT operations from a wider perspective and looking for tools to support a wider number of operations, not just service desk as a stand-alone operation. However when buying a new tool, organizations need to understand if they really need support for all those processes that ITSM suites include or just one or two. (Coyle et al. 2010.)

Focus on integration: Integration to other tools is an important deciding criterion for customers. Depending on the tool, the integration can be challenging and costly. Vendors of service desk tools will tell their customers that their tool can integrate with any tool. It needs to be made sure, however, how demanding and costly it will be already when choosing the tool. (Coyle et al. 2010.)

4.4 Summary

This thesis investigates the results gained from these two assessment models and Gartner's research to provide information for the tool assessed in this thesis. The findings are provided in section 6 and 7 with appendix 1 showing the comparison of the tools.

The assessment models introduced in this section help organizations in two ways. From the vendor point of view the assessment models give a possibility to separate themselves from its competitors and provide proof that the tool they provide is ITIL® compatible. From the customer point of view the assessment models provide information about a wide variety of tools that are ITIL® compliant. The customer organization can then be sure that the tool fulfils their needs in certain processes.

Gartner's Magic Quadrant for IT Service Desk is useful from the customer point of view by going through the most important aspects of the Service Desk market and by introducing the global tool vendors and their tools. It provides a good view into what is happening now in the market and what will possibly happen in the future.

An organization looking for an ITSM tool for their organization should pay attention to these assessment models and Gartner's research to get additional information about the tools operability. These are easy ways to ensure the tool's compatibility with ITIL® and to gain information about how widely they are used. It is important to know that the tool and the organization providing the tool is reliable and stable and provides tools that are widely used with satisfied customers.

5 Method

This section briefly introduces the methods that were used to collect and analyze the information. Section 5.1 introduces the research methods and section 5.2 introduces the analyzing methods.

5.1 Research Methods

This research was conducted by collecting relevant information about IT Infrastructure Library®, two different assessment models, one research about ITSM tools on the market and by interviewing selected vendors and customers of the selected tools. Relevant information about ITIL® was collected from the latest research concerning ITIL® V3 processes and technology related requirements. Information about the assessment models was collected by researching official websites on the models. Qualitative research about the selected tools was conducted by interviewing both the vendor of the tool and the customer using the tool. The questions that formed the interview themes in this research were conducted on the basis of ITIL® V3 requirements and other researches and assessment models by third party organizations. The main subjects were compatibility with the ITIL® V3 framework, implementation capabilities, integration capabilities and functionality of the tool.

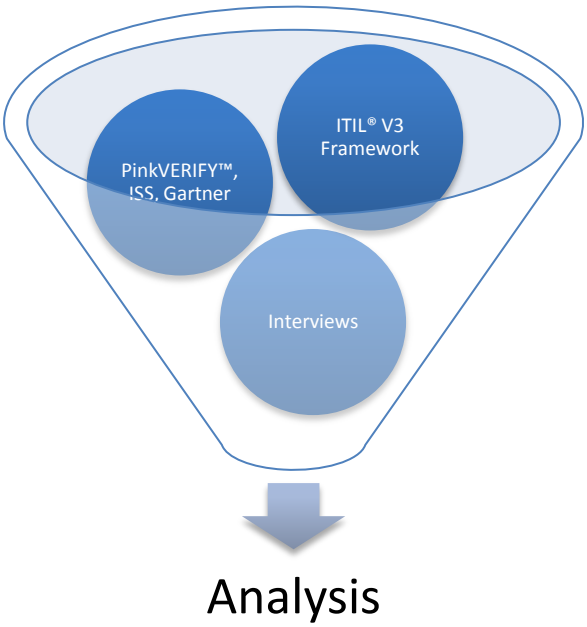

Figure 3. Research methods

5.2 Analyzing Methods

At the base of the analysis were the research questions. The goal was to provide clear answers for all the research questions stated in section 1.4. Once the interviews had been conducted the results were organized and labeled to certain categories such as ITIL® compatibility, integration and implementation capabilities and the functionality of the tool. The data from the interviews was then collected and analyzed and compared to the ITIL® V3 framework recommendations and to the assessment models (ISS and PinkVERIFY™) and to the results from Gartner's research. The results allowed making, general recommendations regarding selecting, implementing and using a tool.

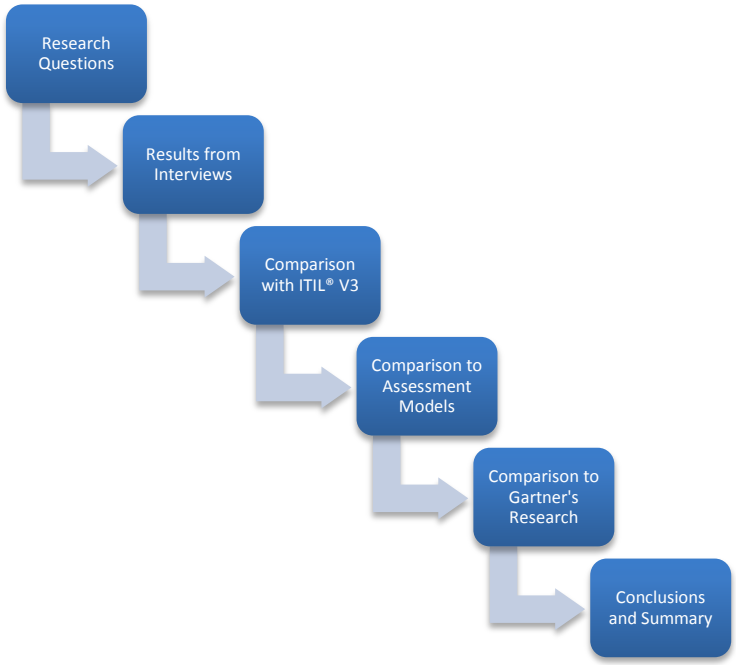

Figure 4. Analyzing Methods

6 Vendor and Customer Interviews

This section introduces each of the nine tools along with the interviews. First there is a short description of the tool itself and the company that develops it with a screenshot of the tool. The interviews then follow, first with the vendor and then the customer. The interviews are written out to describe the results thoroughly. After each interview there are general comments from the interview. The interview questions can be found in Appendix 2 vendor questions, and Appendix 3 customer questions.

6.1 Altiris

Altiris is a subsidiary of Symantec focusing on service-oriented management solutions. Symantec acquired Altiris in 2007. Symantec is one of the largest software companies in the world providing security, storage and systems management solutions. (Symantec 2007.)

Altiris service oriented management solutions provide a modular approach to managing IT infrastructure. This includes products such as Symantec ServiceDesk, Altiris Client Management suite, Altiris Server Management suite and Altiris Asset Management suite. (Symantec 2011.)

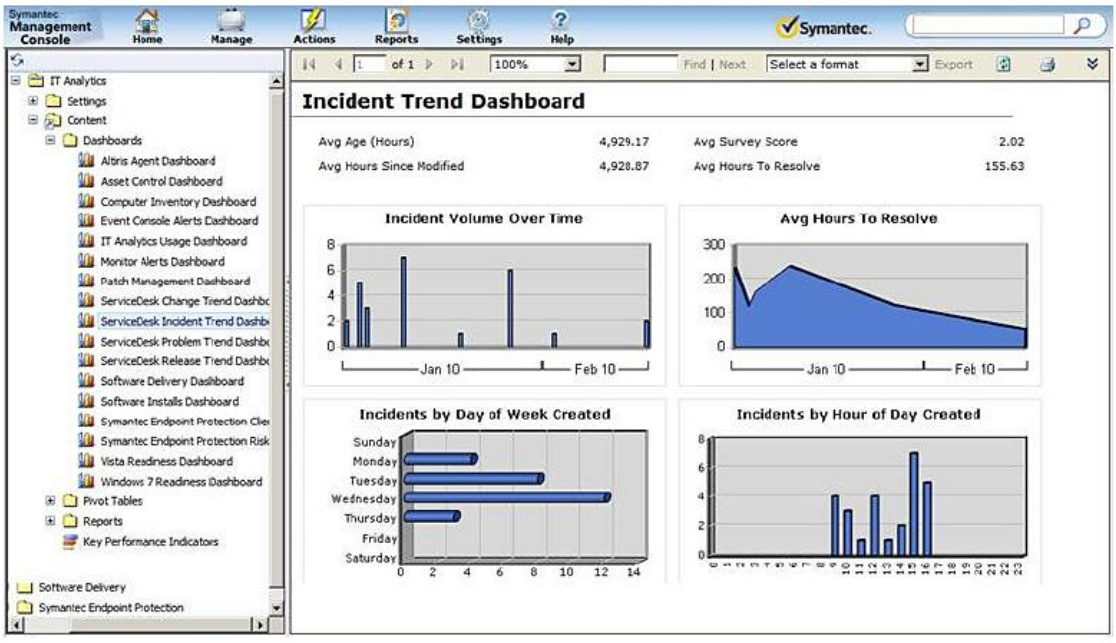

Figure 5. Altiris

6.1.1 Vendor, Academica

Interviewee: Timo Hämäläinen

Version: Altiris 7.1

The vendor of Altiris management solutions in Finland is Academica. United Business Machines UBM Oy was the vendor of the solution from 1999 until 2008 when Academica acquired all the shares of UBM. (UBM 2011; Academica 2011.)

Altiris Service Desk is compliant with ITIL® V3 processes and terminology. Altiris Service Desk v6 is certified by PinkVERIFY™ 2 for a number of processes for ITIL® v2 compatibility (Pink Elephant 2011b); however the new version, Symantec ServiceDesk version 7.11, is certified only for Incident Management (Pink Elephant 2011d).

Academica, the vendor of Altiris in Finland has their process consultants and pre-sales personnel trained in ITIL® V3. There has been no reason to have the rest of their staff certified, but they provide internal training depending on the needs.

Target customers for the Altiris solution are midsized and larger companies. As it is large and expensive, smaller companies generally have no need for such a solution. There are other possibilities for them, however, such as Academica offering them IT services provided through Altiris Service Desk as an Application Service Provider (ASP).

The solution is preferred to sell as an out-of-the-box solution, but as all companies have unique processes and workflows it does require a level of configuration. This is achieved with the workflow engine provided in the solution itself. The solution always includes all processes; however, Altiris also provides additional tools that can be integrated to Service Desk and support even a bigger selection of processes. A new version of the tool has an improved version control to simplify the updating of the tool. The earlier versions had some difficulties in this area.

The implementation project generally takes two to three months, the majority of it going to process consulting. There are several factors in play and the time can vary greatly. Aspects such as the maturity of the customer's IT processes, the amount of resources and working hours all affect the length of the implementation project. The customer should be ready to provide staff for assisting the supplier's consultants in general things. The supplier does, however, provide consultants and technicians for process development and installation of the tool. Also how widely the organization wants to adopt the solution has an impact. The project should generally be started

from the most basic processes e.g. Incident Management and then slowly expand to other processes.

Academica provides training for Service Desk employees in the customer organizations. They also provide more demanding training for admin users and for experts needing to use the workflow engine.

The software license model used in Altiris is a fixed charge and a minimum of 5 expert or Service Desk user licenses for concurrent users.

Role based security is in place with an Active Directory (AD) path flow integration. Roles are very configurable with little training.

The most common integrations with readymade solutions are provided for Microsoft SharePoint and LDAP and the earlier mentioned AD. Other possibilities are provided through the workflow solution provided in the tool itself.

The tool only has a web-based user interface. There is no Software as a Service (SaaS) possibility for the Altiris solution. Academica, however, offers the Application Service Provider (ASP) option using Altiris Service Management suite.

The solution includes its own reporting engine and readymade reports. Customizing reports for the company's own needs is done with the reporting engine. In addition Altiris also has an IT analytics add-on tool that provides even wider possibilities with report customization and historical reports. Exporting data outside of the tool to other products such as Excel and printing them are supported.

The Integrated Service Desk tool has relations between all different processes. The tool provides unique logging IDs for each ticket and links the affected CIs to it. Tickets are automatically prioritized related to impact and urgency. These can then be manually assessed again if needed.

CMDB can be populated with data from Client Management Agent, another solution provided by Symantec. After CMDB is populated links between CIs and other records are established. It can be viewed with a visual tool also. Manual editing and upkeep of these records is possible.

Comments:

- Software license model used in Altiris is a fixed charge and a minimum of 5 expert or Service Desk user licenses for concurrent users.

- Preferred to sell as an out-of-the-box solution, but as all companies have unique processes and workflows it does require a level of configuration.
- Implementation project generally takes two to three months, a major part spent on process consulting.
- CMDB can be populated with data from Client Management Agent. It can be viewed with a visual tool also.
- Own reporting engine and readymade reports allowing customization of reports. Additional IT analytics add-on tool to increase reporting possibilities.
- Target customers are midsized and larger companies.

6.1.2 Customer, Academica

Interviewee: Antti Ahola

Version: Altiris 6.0

Academica Oy is an IT and telecom service provider located in Helsinki. Originally they were founded in 1932. ICT business started in 1985. Academica's product offering includes ICT Management and operator services such as Telecommunication, MPLS based enterprise network, GSM, Internet, and Hosting services. (Academica 2011.)

Academica acquired the Altiris ITSM solution to support their daily business operation, business functions and resource planning. Prior to acquiring the tool, Academica had no ITSM tool in use. A small in-house produced ticketing system was in place that was not capable of handling the needs of the growing organization. Instead of using Altiris Service Desk just as a simple ticketing system, it is used in a much wider scope serving almost as an ERP system for Academica. The features of Altiris Service Desk Academica uses are the basic service desk processes as well as CMDB, which is at the heart of the solution, and also the reporting functions it offers. Altiris was selected as the solution thanks to the traits and functionalities it has, with price playing a part in the process.

Academica has been generally happy with the product. It has fulfilled the needs they had and it works well. As Altiris has been on the market for a while with version 6.0, it is an established product, with very few bugs around anymore. To fully implement and support the operations of Academica, it still needs constant development in-house.

There have been some problems related to CMDB and in workflow management, but generally problems have been minimal.

Academica went in production with Altiris Service Desk in 2008. The implementation project was less than 2 months of active work. This includes the installation of the tool and process development for basic processes and workflows. The project continued developing after going in production having additional processes implemented with time. During the implementation project Academica also adopted ITIL® V3 workflows and processes.

Training was provided for all staff on how to use the product and training days are provided for staff later on as well. New users are trained in-house. There are no ITIL® V3 trained employees; however ITIL® V2 training has been done before.

Relationships between the processes are working fine and are easy to use in the solution. The same applies to CMDB integration. Reporting and dashboard capabilities, equipped with the Altiris IT Analytics solution, fulfil the needs Academica has. On a general note, the usability of the tool is found easy and fast to learn. CMDB has not been fully automated yet, but has to be manually updated.

The use of the solution has given a better understanding of the current situation in the organization. This is achieved by automation and faster access to information. It allows focus on important more complicated tasks, when simple ones are automated.

Comments:

- Academica acquired Altiris ITSM solution to support their daily business operation, business functions and resource planning. Prior to acquiring the tool, Academica had no ITSM tool in use.
- Altiris supports basic service desk processes and CMDB in Academica.
- In production with Altiris Service Desk in 2008. The implementation project was less than 2 months of active work.
- Reporting and dashboard capabilities, equipped with the Altiris IT Analytics solution, are in use.
- CMDB has not been fully automated yet, but has to be manually updated.
- The use of the solution has given a better understanding of the current situation in the organization. This is achieved by automation and faster access

to information. It allows focus on important more complicated tasks, when simple ones are automated.

6.2 Axios Systems

Axios Systems was founded in 1988. The company has a 100% focus on IT Service Management. They provide solutions, not just products, combining their assyst software with industry expertise and a focus on delivering long-term value. Axios Systems delivers enterprise-class Service Management Software (assyst) and IT Asset Management Software (ITAM). (Axios Systems. 2011.)

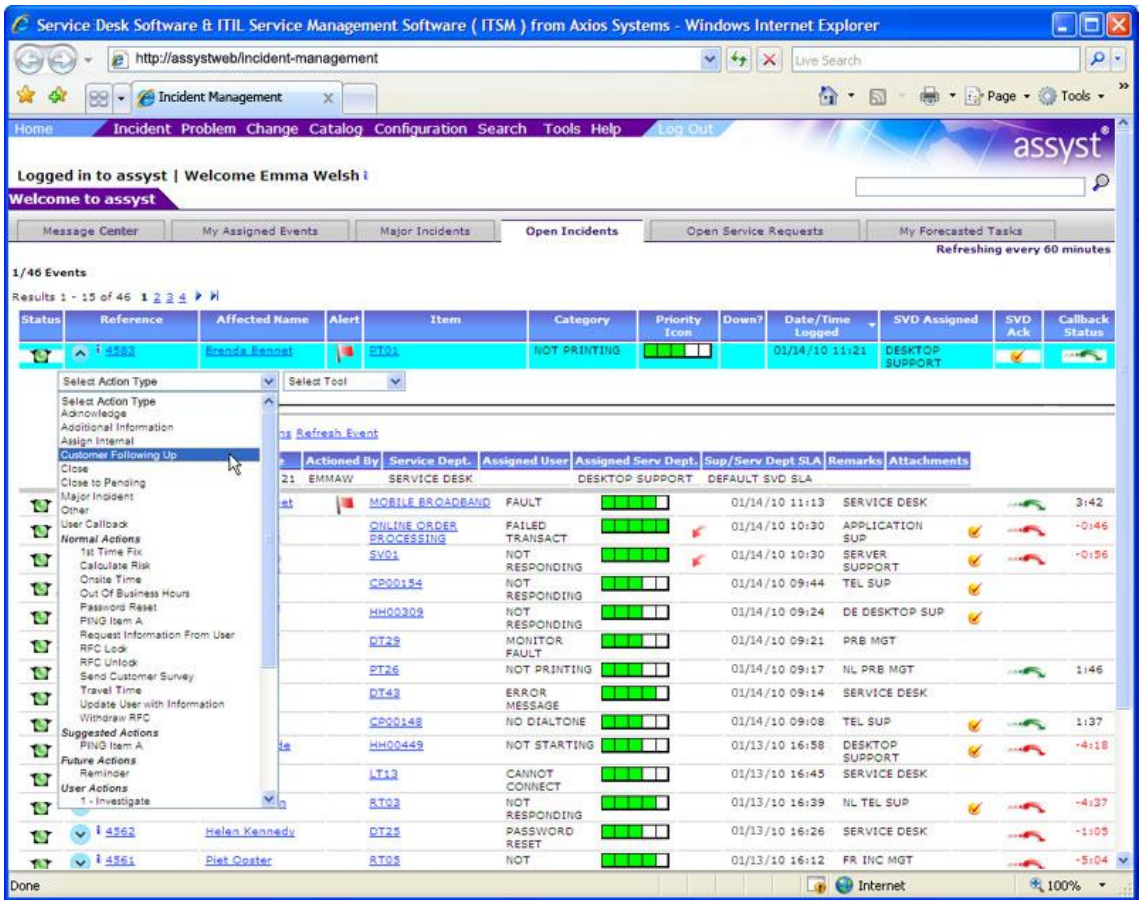

Figure 6. Assyst

6.2.1 Vendor, DataCenter Finland Oy

Interviewee: Eija Hallikainen

Version: Assyst v9.0 SP2

DataCenter Finland Oy was founded in January 2009 when experienced IT companies Bemecon Oy, Decasys Oy, DataCenter Finland Oy and DCF DataCenter Services

merged. The company provides reliable ICT infraservices and their service portfolio includes: high quality hosting services, helpdesk and expert services, system administration and service management solutions as well as software and equipment. (DataCenter Finland Oy. 2011.)

The terminology and workflows are directly applied from ITIL®, which makes the tool ITIL® compatible very widely. DataCenter provides Assyst in Finland. Almost every employee in DataCenter is ITIL® V3 certified.

The following processes are included in the tool: Incident Management, Problem Management, Change Management, Release Management, Service Asset and Configuration Management, Service Level Management, Finance Management, Service Catalogue Management, Capacity Management, Availability Management, Service Portfolio Management, Knowledge Management, Event Management, Request Fulfilment.

Assyst v9 is not currently certified by PinkVERIFY™, however, an older version Assyst v7.5 is certified by PinkVERIFY™ 3 in 12 processes (Pink Elephant 2011d).

The tool is best suitable for midsized companies with personnel over 500. For smaller companies the pricing can be a critical factor. The tool is provided as an out-of-the-box solution as much as possible. The configuration is, of course, needed to fit the tool in the organization's daily operations, but customization is not needed. Updating the tool is simple and straightforward. The software updates save all the configurations and the new updates do not affect to them. In some cases version updates are not saved. Maintenance costs cover new versions and it is recommended that customers always update to the newest version available.

Assyst is always provided as a whole ITSM suite. It includes all the processes and modules as constant and these modules are under one license. However, it is possible to implement only the processes, which are needed. There are also some extra modules, which can be adapted.

AssystNET provides functions where customer views can be limited to only their own services and parts of the information provided. It is also possible to limit individual employees or groups to see limited sections.

The implementation time varies from 10 to 75 days depending on the scope. Axios Systems provides a very specific implementation methodology to ease the process.

First the maturity of the customer is evaluated and after this the next steps are defined with certain time limits and pricing. The implementation project needs, on the customer side, one project manager and other employees that will be responsible for the selected processes. DataCenter provides the tool training in Finland, but in some cases also Axios Systems can take part in this. Additional training for process consulting can be provided by third party organizations.

The licensing method of the tool is separated to four different categories, which are: license for the entire ITSM suite, up keeping license, server license and user licenses. There are two different types of user licenses, which are divided to floating and authorized licenses. On top of these also extra modules are separately invoiced.

The tool provides XML, LDAP and integration for AD's. For business applications it is possible to import and export information through CSV/XML files. Also predefined integrations for the major tools in the market are established, but the integration to the other systems is only recommended if really needed (high amount of tickets).

The tool supports web based user interface, however admin client is still Windows based. Axios Systems and DataCenter both offer SaaS option, DataCenter from its own servers. Most of the customers still prefer the implementation of the tool and not so many are interested in the SaaS option.

The tool provides easy function for linking attachments to tickets where attachments are linked automatically to incident records when customer sends email with attachment. Attachments are also easy to add later to incident records. The tool provides easy compilation system for analyzing information where the wanted fields can be modified in the tool and later print or export to Excel for later analyzing.

The CMDB is easily kept up to date but the tool itself does not provide inventory tool as constant. However, other inventory tools can be integrated to the tool. The CMDB is at the core of the tool and visual CMDB impact explorer is provided with an option to drill down to each CI.

The tool includes out-of-the-box reports but reports cannot be produced inside the tool. Other reporting tool is needed for producing reports, for example Crystal reports. The tool provides archiving functionality for management reports.

The tool identifies and categorizes different tickets automatically by their type and priority. Also the correct support team can be added for tickets. These can be also

changed manually. The criteria are self-determined, but later they will be more according to ITIL® V3.

The tool provides unique logging IDs for all tickets and has links to CIs and has references between them.

The tool does not provide an option for Event Management for monitoring component performance or usage levels against customer defined thresholds but integration to another tool is possible.

The tool provides a self-help function and knowledgebase to ease the Service Desk use. Remote control option is not available in this version but will be in future updates. Workflow process designer is available and end users are able to see in which point the process is currently. Separate learning portal is not supported.

DataCenter provides the tool also in Finnish if desired by the customer. It is also possible to use AssystNET in Finnish.

Comments:

- License for the entire ITSM suite, maintenance license, server license and user licenses. There are two different types of user licenses, which are divided to floating and authorized licenses. On top of these also extra modules are separately invoiced.
- The tool is provided as an out-of-the-box solution as much as possible. The configuration needs, of course to fit the tool in the organization's daily operations. Customization is not needed.
- The implementation time varies from 10 to 75 days depending on the scope.
- The tool includes out-of-the-box reports but reports cannot be produced inside the tool. Another reporting tool is needed for producing reports, for example Crystal reports.
- The CMDB is at the core of the tool and a visual CMDB impact explorer is provided with an option to drill down to each CI.
- Target customers include midsized companies with personnel of over 500. For smaller companies the pricing can be a critical factor.

6.2.2 Customer, DataCenter Finland Oy

Interviewee: Eija Hallikainen

Version: Assyst v9.0 SP2

DataCenter Finland Oy was founded in January 2009 when experienced IT companies Bemecon Oy, Decasys Oy, DataCenter Finland Oy and DCF DataCenter Services merged. The company provides reliable ICT infraservices and their service portfolio includes: high quality hosting services, helpdesk and expert services, system administration and service management solutions and software and equipment. (DataCenter Finland Oy. 2011.)

The tool was originally acquired for Service Desk use with an option for wider use later on. DataCenter was looking for a substitute for Lotus notes in 2008 and decided to choose Assyst. There were several reasons that made the selection process easy. First of all the tool seemed to be very mature with a wide scale of operative functions. Another reason why the tool was acquired was that Axios Systems was looking for a partner in Finland. A systematic selection process was not used and the selection was based on the previously mentioned reasons.

DataCenter has CMDB, Incident, Problem, Change and Release Management in use. The tool has fulfilled the expectations and operates in a multi-client environment (over 1300 clients) very well.

The tool supports ITIL® processes well and therefore no modifications to existing processes were needed. The Incident Management process was defined prior to tool implementation and the Change Management process was defined after the implementation. Axios Systems had predefined process models and no heavy process definition was needed.

The implementation process started in February 2009 and the first pilot was ready in April 2009. During the implementation process four organizations emerged and affected the implementation process. Collecting the background information and data from the organizations took some time. Two employees were working half their work time with the tool during the implementation. Other employees were just trained to use the tool. This was done inside the organization after Axios Systems had trained two technical persons from DataCenter. The implementation process continues and new processes are being adapted into use.

DataCenter has almost everyone from the 54 employees trained in ITIL® V3. All new employees are trained in ITIL® V3.

Only a few technical problems have occurred. The main problem is related to Customer Service Groups (CSGs) where the tool supports only 1000 CSG's. However DataCenter has over 1300 CSGs. The problem here has been that the text search is not working properly.

Assyst does not have a tool for Event Management and therefore DataCenter is implementing Nimsoft for this use and it will be integrated with Assyst.

Assyst has 40-50 pre-conducted dashboard meters and DataCenter has these very widely in use in their daily operations. Some of them are a bit modified and some additional reports were made with Crystal reports.

The tool is widely configurable for the organization's needs. Collecting information is easy and it is easy to combine different search criteria. The Configuration Management Database is working well although not all the information is entered into the system. Currently customer, organization and staff related information is kept up to date. Also the Service Level Agreements are in the CMDB.

The CMDB is easy to keep up-to-date but time consuming, because the tool itself does not provide a discovery tool. A discovery tool can be integrated but this is also very complex due to the fact that DataCenter has over 1300 customers. They have, however, a script for this to get the information from their customers. In-house, there has not been a need for a discovery tool. Information to CMDB can be done via Excel importing. They have had some problems uniting the information but no technical problems have occurred.

The CIs from the datacenter have not been collected and the information about which servers run the customer's services is unknown because DataCenter uses virtual datacenters. The datacenter is continually increasing its capacity and therefore it has become essential that this information is collected and automated in the future.

The access right issues are handled via different roles in the tool. These are easily formed and access rights are separately announced.

Some of the employees have said that the tool is visually dull but the most important thing is that it performs fluently. The tool has great usability and configuring is easy.

Different customer groups are easily formed. From the service provider point of view the tool is excellent.

Comments:

- The tool was originally acquired for Service Desk use with an option for wider use later on.
- DataCenter has CMDB, Incident, Problem, Change and Release Management in use.
- The implementation process started in February 2009 and the first pilot was ready in April 2009.
- Assyst has 40-50 pre-conducted dashboard meters and DataCenter has these very widely in use in their daily operations. Some of them are a bit modified and some additional reports are made using Crystal reports.
- The CMDB is easy to keep up-to-date but time consuming, because the tool itself does not provide a discovery tool. The tool operates well in a multi-client environment (over 1300 clients).
- From the service provider point of view the tool is excellent.

6.3 BMC Software

BMC Software was founded in 1980. The company's corporate headquarters are located in Houston, Texas and their international headquarters are located in Amsterdam and Singapore. BMC Software has market coverage in over 124 countries. Products are sold through direct sales and indirect channels including resellers, system integrators and original equipment manufacturers. BMC Software has focused, for more than 25 years, exclusively on developing software that improves IT efficiency and value. (BMC Software. 2011.)

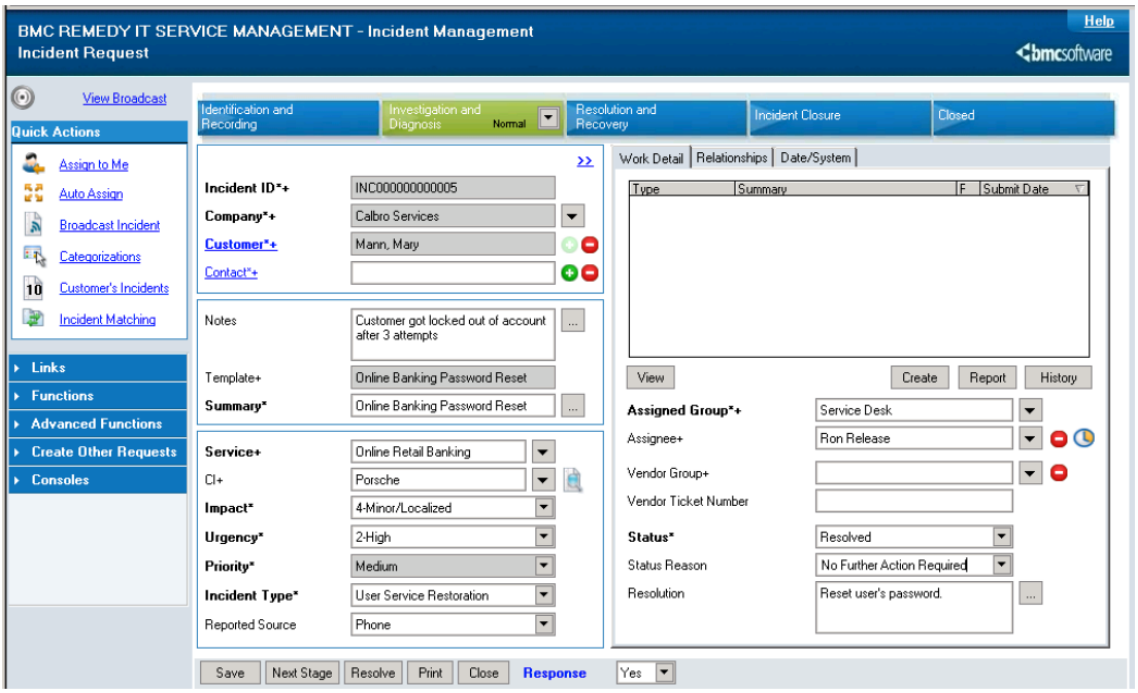

Figure 7. BMC Remedy

6.3.1 Vendor, MATERNA – Information & Communications

Interviewee: Markku Saarikoski

Version: BMC ITSM Suite v. 7.4.04

The MATERNA group was founded in 1980. MATERNA is an IT service provider that employs more than 1300 employees across Europe. The company is among the leading independent service providers in Europe's information and communication technology sector. MATERNA provides innovative solutions, products and services that are employed in business and public administration as comprehensive solutions or as solution models. (MATERNA – Information & Communications. 2011.)

The BMC ITSM Suite has been fully ITIL® V3 compatible for over three years. It has full support for the terms and processes.

MATERNA's working habits are driven by ITIL®, customer satisfaction and profitability. MATERNA is an accredited ITIL® training organization and almost everyone who works with the tool is at least ITIL® V3 Foundation certified. IT business consultants have received higher training in ITIL®.

The BMC ITSM Suite consists of eleven processes, which are all PinkVERIFY™ certified. These processes are: Incident Management, Problem Management, Change Management, Release Management, Service Asset and Configuration Management, Service Level Management, Service Catalogue Management, Availability Management, Knowledge Management, Event Management and Request Fulfilment.

The tool is best suitable for mid-size to large organizations. The "minimum" workstations are generally from 200 to 400. Currently the largest customer for MATERNA has 160 000 workstations. The tool is also suitable for service operators that serve their own clients. The BMC ITSM Suite is very scalable and also suits small companies. However, this may not be optimal from an investment point of view. The tool would be unnecessarily heavy-duty for small companies.

The BMC ITSM Suite is preferably sold as an out-of-the-box solution with little configuration. The main approach is to start with an out-of-the-box situation and configure it to support the operations of the organization. Previously the tool needed more customization but nowadays the objective is to stay as close as possible to the out-of-the-box solution. It is a more safe and cost-effective option for both sides. The AR System as a BMC Remedy platform gives an absolute possibility to customize relatively easily and it supports ITIL® processes fully. Customization, however, can increase challenges for upcoming version upgrades.

It is possible to implement only the needed processes for the customer organization. All models are, however, sold as a package. The recommendation is that different processes are implemented step by step.

The maintainability and basic updates of the tool are relatively easy to handle by the customer organization. Patch updates are always downloadable and can be installed by the customer organization. A new version is a bigger change and needs therefore an expert and it is suggested that the supplier does it. If the tool has been customized to great extent, it is always a bigger risk and therefore configurations are preserved. It is promised that the updates do not affect customizations but they do need to be checked and that increases working hours.

The implementation time is mostly dependent on the size of the organization and even more on what or how many modules will be implemented. A basic installation of the system takes up to one week but usually the whole implementation process takes two to three weeks of work time. For basic processes, such as Incident Management, the

results are usually faster. For these the implementation time runs between 10 to 20 days and with this the Incident Management process should be up and running in about one month. From the customer point of view the implementation process needs at least 2-3 employees from the organization including a project manager and the needed amount of system admins.

After the customer has decided to purchase the BMC ITSM Suite, an ITIL® system simulator game is organized for basic knowledge about the processes. This is a one-day project kick-off where the maturity of the company is defined and also the knowledge about ITIL® is measured. If this is not needed also shorter briefings are offered. The customers can also take part in ITIL® V3 Foundation courses for deeper knowledge about the processes. MATERNA then trains the key personnel during the project and provides learning material for the customer. The objective is that after this the customer organization trains the end users with their own modified learning material.

The BMC ITSM Suite includes the following in its license. First there is an application license i.e. Suite for the system delivery, which includes several separate environments such as development, test and operation environments. Then there are two types of user licenses, which are separated to named (fixed) and floating licenses. The end users can use the requester console for free, but the customer portal's usage needs end-user licenses (fixed or floating).

The tool provides Atrium Integrator Engine for integration to other business applications. This means that the data can be either pulled in or pushed out. MATERNA also provides MATERNA Integrator where the data can be put into a form that the BMC ITSM Suite understands.

The BMC ITSM Suite has very wide role based security. There are many roles in the out-of-the-box version also, but usually customers tend to make their own settings and modify these roles. There is no need for consultants when defining these settings. The tool supports a multi-vendor environment with the included service provider option. The roles, access rights and views are easily defined.

The processes inside the tool are well linked to each other with minimum configuration needed. No coding experience is needed and a service manager can make all these changes.

The tool supports a web-based user interface and it is prominent on the new versions. However, the tool still supports also Windows clients. The tool provides a SaaS function by BMC, but the servers are not located in Finland.

The tool includes approximately 100 pre-defined reports conducted by Crystal Reports and on top of these ARS includes approximately 50 pre-defined reports. The customer can easily create reports with ARS, which does not require knowledge about Crystal Reports. These reports are relatively easy to create and do not need consulting. However, reports are generic and sometimes customers need help with these. Usually short training and training material is enough. The pre-defined reports are usually configured to customer's needs.

The tool includes an archiving possibility for all forms. All historical information is easily available and the printing and later analyzing of the reports is easy and straightforward. The tool includes unique logging and allocating for all tickets and has a link to CI records and reference between them. The incident records contain four-step priority levels for tickets and these are easily modifiable later.

The tool provides Asset Management for customers where the infrastructure items and their relationships are shown in visual form. Monitoring tools (BeM/Patrol) are provided separately where the information is directly exported for Service Desk use.

The tool provides self-help option with integrated Knowledge Management. It has also direct integration with, for example, Google. A remote control option is provided separately and it is not included in the ITSM Suite. The discovery tools are not included in the ITSM Suite but they can be bought separately and they are automatically integrated to the ITSM solution Atrium Database Directory Mapping from BMC.

Comments:

- The BMC ITSM Suite includes the following in its license: Application license i.e. Suite for the system delivery, which includes several separate environments such as development, test and operation environments as well as two types of user licenses, which are separated to named (fixed) and floating licenses. The end users can use the requester console for free, but the customer portal's usage needs end-user licenses (fixed or floating).

- The BMC ITSM Suite is preferably sold as an out-of-the-box solution with little configuration. The main approach is to start with an out-of-the-box situation and configure to support the operations of the organization.
- A basic installation of the system takes up to one week but usually the whole implementation process takes two to three weeks of work time.
- The tool includes approximately 100 pre-defined reports conducted by Crystal Reports and on top of these ARS includes approximately 50 pre-defined reports. The customer can easily create reports with ARS, which does not require knowledge about Crystal Reports.
- Asset Management handles the infrastructure items and their relationships are shown in visual form. A Discovery tool is not included in the ITSM Suite but can be integrated.
- The target customers are upper midsize to large organizations. The "minimum" workstations are generally from 200 to 400. Currently the largest customer has 160 000 workstations.

6.3.2 Customer, National Land Survey of Finland (Maanmittauslaitos)

Interviewee: Asta Forsström-Ekholm

Version: BMC ITSM Suite v. 7.6.01

The roots of National Land Survey of Finland go back to the 17th century when the open field system was used to divide arable land. NLS Finland produces and provides information on and services in real estate, topography and the environment. The NLS Finland is responsible for Finland's cadastral system and general mapping assignments and promotes the shared use of geographic information. (National Land Survey of Finland. 2011.)

The tool was originally acquired for ITSM use to get more processes in daily operation. Especially Change Management was very important for NLS Finland. The main problem was that there was previously no tool in use for processes outside the Service Desk operation. The old tool was used mainly to handle incidents but this however was not enough. The previously used tool was BMC's Remedy ticketing tool and it was only for the Service Desk use. The Change Management process was not separately in use and it was mixed with Problem Management.

The main reason why BMC's ITSM Suite was selected was due to the fact that it had been in the markets for long time. NLS Finland was looking for a mature tool with wide operational use. Gartner's Magic Quadrant for IT Service Desk research had a big effect because BMC's tool was placed in the upper right-hand corner. Also their earlier experiences about the BMC Remedy ticketing tool had an effect. Integration with other applications was also a high criterion because they have IBM Tivoli and LANDesk in use in the other departments in the organization. The tool had all the needed processes available and it seemed to be the right product for the company.

The definition of the processes started in the end of the year 2009. The processes were previously defined to some extent but they needed polishing against ITIL® V3. For example a separation between the Incident Management and Problem Management processes was needed. The purpose was to use as many out-of-the-box processes as possible and polish some processes to fit the tool. The processes are well defined in the tool and therefore no changes were needed to make.

The implementation time was from January 2010 to June 2010. NLS Finland first implemented the Incident and Problem Management processes. Asset Management/CMDB covers workstations and printers and software and license agreements will be implemented in the near future. They have purchase management in use to control orders. Service Request Fulfilment is applied for self-service needs. Service Level Management is in use with controlling service levels and for measuring response times. Change Management is currently in testing and will be applied later. Also Configuration Management will be implemented later.

NLS Finland had some problems during the implementation, which delayed the full implementation process. The problems were mainly integration problems where they had to do configuring several times and almost always ended with undesirable results and the effects are not known until later. For example already inactivated tickets opened again without any reason. During the implementation, customer and device data was entered in the system and integration with LANDesk and the tool was formed. The integration time was doubled compared to the promised time and in the end it was approximately eight working days.

The customer said that the tool has not been very reliable. The tool operates as it should when changes have not been made but otherwise there are immediately problems. The implementation project needed one project manager and six to ten

admin users from the company. The total time used for the implementation project was approximately 12 months when calculating in man-hours per year.

The tool has not fulfilled the company's expectations. The implementation has been challenging in many ways and there have been more bugs in the tool than expected. The tool was supposed to be mature but it turned out to be full of bugs. Specified customization was required to make it fully usable. Service Request Management and purchase management have been challenging to integrate. Many problems have been reported to technical support and many of them all the way to BMC. Fixing the problems has been slow. The tool is constructed from various modules and some of them are easy to configure but some of them are really difficult. Service Request Management in particular had been difficult to configure and it had to be done fully with technical support. Also managing the purchase management has been difficult. However, classification and Service Level Management are easy to maintain.

MATERNA provided training for the process owners needing to use certain modules of the tool and also specialist training. Wakaru provided ITIL® V3 training and the course was for everyone (40 employees) working at NLS Finland. It was a one-day course about the basic knowledge of ITIL® V3. The ITIL® V3 Foundation course was optional and approximately 15 employees took part in it. Ten of them have been ITIL® V3 Foundation certified. The experiences are that ITIL® V3 training should be organized again after the implementation to be able to connect it to practice, to make sure that everyone understands the benefits.

The biggest problems aside from integration problems have been in adopting the new ways to operate and abandoning the old ones. LANDesk's discovery tool is used at nighttime and sometimes it is not working properly with CMDB. However the relationships inside the tool are well handled and easy to use.

The reporting functions are not in use as much as desired. NLS Finland has had problems with the out-of-the-box reports where some of them work fluently but some of them do not. The reports do not support Locale Finnish and therefore the reports come out as blanks. The reporting functions are currently dealt with by searching the data and importing it to Excel. They are hoping that the new update will fix the problems. NLS Finland does not have resources for creating its own reports and it has been more challenging than promised. Also the Dashboard is not working properly and

is producing false information. Basic information is easy to get but more advanced information is difficult to collect.

Role based controls are also complicated and all the roles need to be defined on a module basis.

The tool has not yet supported the decision making process but the expectations are that the benefits will be bigger after implementing the Change Management process.

Comments:

- The tool was originally acquired for ITSM use to get more processes in the daily operation. The old tool was used mainly to handle incidents but this however was not enough. The previously used tool was BMC's Remedy ticketing tool and it was only for the Service Desk use.
- Incident and Problem Management processes are entirely implemented. Asset Management partially. They have purchase management in use to control orders. Service Request Fulfilment is applied for self-service needs. Service Level Management is in use with controlling service levels and for measuring response times. Change Management is currently in testing and will be applied later. Also Configuration Management will be implemented later.
- The implementation time was from January 2010 to June 2010.
- The reporting functions are not in use as much as desired. NLS Finland has had problems with the out-of-the-box reports. Reporting functions are currently dealt with by searching the data and importing it to Excel.
- Asset Management / CMDB covers workstations and printers and software and license agreements will be implemented in the near future. LANDesk's discovery tool is used at nighttime and sometimes it is not working properly with CMDB.
- The tool has not yet supported the decision making process but the expectations are that the benefits will be bigger after implementing the Change Management process.

6.4 CA Technologies

CA Technologies is an IT management software and solutions company founded in 1976. It operates across the board in IT environments and is one of the largest independent software companies in the world. (CA Technologies 2011.)

The tool in this thesis is CA Service Desk Manager r12.5.

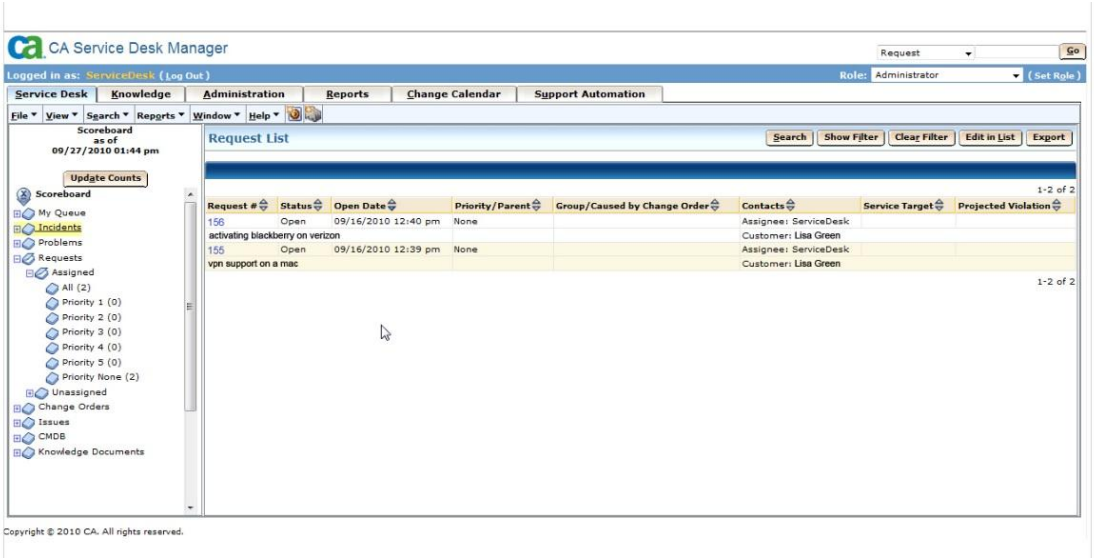

Figure 8. CA Service Desk Manager

6.4.1 Vendor, CA Technologies

Interviewee: Timo Kaarenmaa

Version: CA Service Desk Manager r12.5

Vendor of CA Technologies ITSM suite in Finland is the Finnish subsidiary of CA Technologies.

CA Service Desk Manager is designed based on ITIL® V3 and ITIL® V3 terminology is applied. CA Technologies provides Content Pack for ITIL® for their customers. It is meant to help them develop and implement standardized IT Service Management processes. Most ITIL® trained personnel work in pre-sales, service and development organizations. Most are ITIL® foundation level certifications, but higher certifications also exist.

CA Service Desk Manager r12.5 is certified by PinkVERIFY™ for 15 ITIL® V3 processes and OGC's ITIL® Software Scheme Gold Level for 5 processes (Pink Elephant 2011d; Office of Government Commerce 2011b.). The Service Desk Manager also supports some other ITIL® processes and additional tools that can be integrated in the tool set support many of the processes supported by Service Desk Manager.

CA Service Desk Manager is targeted at mid-sized to large organizations generally due to the wide scope and selection of different tools. It is, however, scalable to smaller implementations also. This can be achieved through different licensing options. CA Service Desk Manager has two different licensable options: CA Service Desk Manager Analyst and CA Service Desk Manager Full. They both contain all the same processes and functionalities the only difference being in the CMS of the solution. Analyst includes only basic configuration management capabilities whereas full license contains also CMDB.

The key principle in design and implementation is the out-of-the-box approach. The implementation generally requires some configuration depending on the needs and the maturity of the IT processes in the organization. Most configurations are done via a Web Interface provided in the tool. If there is a need for customer specific customizations, it also provides a Web Screen Painter tool to enhance the database schema and user interfaces. It is generally recommended for an organization to implement one process at a time, but the tool itself will include all the functionalities depending on the license.

The implementation projects vary greatly in terms of time. The maturity of the organization's processes and the amount of tuning and configuration the process requires affect greatly the time required for the implementation. Generally, the time could be anything between 30 and 90 days. For the process to be used to full effect in an organization can take up to several years.

CA Technologies provides training for users depending on the roles they will be using the tool in. There are separate training paths for each role.

Application integrations are provided through standard Web Service and CMDB interfaces. A fully documented database and ERD diagram are provided. An Export/Import interface is also provided to assist in integration. Standard email and LDAP interfaces are commonly used.

The solution has a web interface and CA Technologies also provides Software as a Service (SaaS) functionality. CA Service Desk Manager includes Business Objects Enterprise XI as its reporting platform. There are around 200 out-of-the-box reports and the ability to modify them.

All processes are integrated in the toolset and references between tickets and CIs exist. All tickets have unique loggings and records. The CA process automation product provides full integration for processes and workflows. Incident impact and urgency are calculated based on ITIL® on default, but is configured to customer needs. Service levels can also be monitored and calculated automatically in the product. Role based authorization is in place. Out-of-the-box roles are ITIL® V3 roles, but are configurable.

CMDB is included in the product, which is the basis of the CMS in the solution. It includes all functionalities to define the relationships between CIs and tickets. The CMDB visualizer allows a visual view into the entire CMS. CA Configuration Automation is included in the solution to provide discovery functionality.

Comments:

- CA Service Desk Manager has two different licensable options: CA Service Desk Manager Analyst and CA Service Desk Manager Full.
- A key principle in design and implementation is the out-of-the-box approach. Implementation generally requires some configuration depending on the needs and the maturity of IT processes in the organization.
- A general implementation time could be between 30 and 90 days. For the process to be used to full effect in an organization can take up to several years.
- CA Service Desk Manager includes Business Objects Enterprise XI as its reporting platform. There are around 200 out-of-the-box reports and the ability to modify them.
- The CMDB visualizer allows a visual view into the entire CMS. CA Configuration Automation is included in the solution to provide discovery functionality.
- Target customers are mid-sized to large organizations.

6.4.2 Customer, Digia

Interviewee: Aki Lähteenmäki

Version: CA Service Desk Manager r12.5

Digia Oyj is an ICT company located in Finland. Digia operates in Finland, Russia, Sweden, China, Norway and USA. Digia's product offerings include ERP systems and mobile and user experience services and solutions. Their customers are from various industries such as public administration, industry, mobile industry, retail, services, banking and insurance. (Digia 2011.)

Due to Digia's history, Digia had several ITSM tools implemented and one unified tool was needed to standardize the tool used. As they already were a partner for CA in Finland, handling CA's implementation projects, Digia naturally chose the product they were familiar working with.

The license model used is CA Service Desk Manager full to take full advantage of all functionalities included in the software. The most important ITIL based modules used are: Incident Management, Problem Management, Change Management, Release & Deployment, Request Fulfillment, Service Asset and Configuration Management, Knowledge Management, Event Management and Service Level Management.

The project has been running for one year with incident management fully implemented. The change management project is currently underway. As one of the reasons for starting to use the ITSM tool was to support Asset Management, CMS is seen as an important project and will be the next one in line. The project is part of Digia's continuous development work and Digia will develop the system and processes constantly to improve customer experience. Digia is developing its processes constantly and all processes are implemented as unified processed company wide. This includes all the processes related to continuous services as well as processes related to ITSM.

CA provides training for all admin users in Digia. Admin users then provide training in house for end-users.

Some technical issues rose during the project mainly related to the fact that many existing tools used were in different states lifecycle-wise but as a whole the project has been running smoothly and as planned.

The tool has been found easy and effective to use by Digia's continuous services teams, service managers and customers. Training for Digia's customers and staff has

been effective due to the fact that Digia has a wide range of customer implementations done with the same technology. The Service Desk tool is used company wide and usage is expanding all the time covering a wider range of different types of customer systems and services provided by Digia to its customers. The deployment of the tool has eased and standardized the ways of operations and will benefit Digia's customers and Digia as a company even more in the future as the operations will be more effective and based on standardized products and ways of working. Constant process development work is one key issue to successful operations and effective usage of the tool. All Digia's continuous services processes are based on ITIL® which has helped the implementation and eased also the customer interface when taking the system into use by a project.

Comments:

- Digia had several ITSM tools implemented and one unified tool was needed to standardize the tool used.
- The most important ITIL® based modules used are: Incident Management, Problem Management, Change Management, Release & Deployment, Request Fulfillment, Service Asset and Configuration Management, Knowledge Management, Event Management and Service Level Management.
- The project has been running for one year.
- As one of the reasons for starting to use the ITSM tool was to support Asset Management, CMS is seen as an important project and will be the next one in line.
- The deployment of the tool has eased and standardized the ways of operations and will benefit Digia's customers and Digia as a company even more in the future as the operations will be more effective and based on standardized products and ways of working.

6.5 Efecte

Efecte is a Nordic software vendor specialized in IT Service Management solutions. The company has 300 private and public sector customers. Efecte's offices are located in Finland, Sweden and Denmark. Efecte offers extensive solutions for service management with the foundation in best-practice models. (Efecte. 2011.)

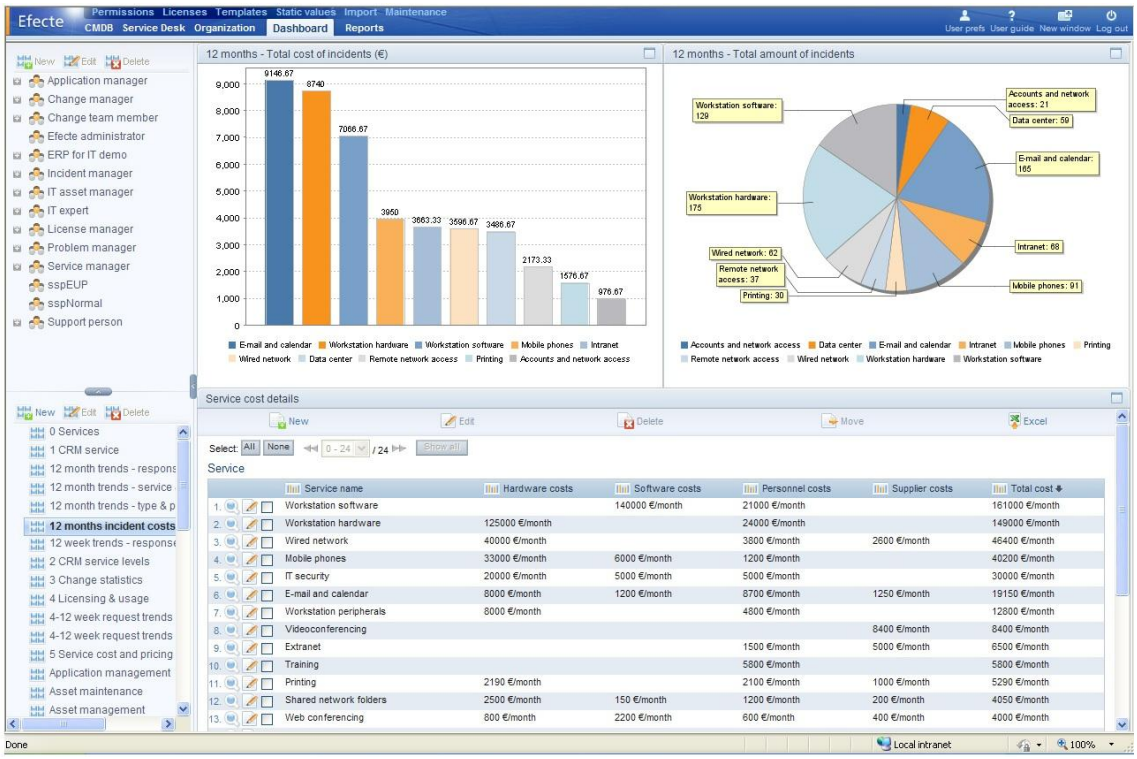

Figure 9. Efecte

6.5.1 Vendor, Efecte

Interviewee: Sampo Pasanen

Version: Efecte v5.3.

Efecte uses ITIL® workflows and terminology as well as possible. This is not however always possible, so they have decided to use what is possible and expand on that. ITIL® training plays a big role in Efecte and most of the 44 employees are ITIL® V3 certified, especially technical and pre-sales employees. New employees are always trained in ITIL® V3 Foundation.

Efecte does not currently have any PinkVERIFY™ certifications because they are not deemed useful or worth the money in the Finnish market. Previously they had ITIL® V2 certifications. It is possible that they will have processes certified in the future if the markets require it. It is clear that in foreign markets these certifications are useful and almost everyone is looking for them.

The tool includes Incident, Problem, Change, Knowledge, Service Asset and Configuration, Service Level, Service Catalogue, Service Portfolio Management and

Request Fulfilment. Finance, Supplier, Demand, Event and Release Management modules are also available but they are not included in the ITSM solution. These extra modules are not out-of-the-box solutions but are configurable and linkable to other modules.

The tool is best suited for midsized companies with over 500 employees. There are not any limitations in the business of the organizations. The tool is provided as an out-of-the-box solution as much as possible, with little configuration. Service Desk module includes processes for Incident, Problem, Knowledge Management and Request Fulfilment (ICT Webshop). The CMDB module includes Service Asset and Configuration, Service Catalogue and Service Level Management. Change Management is sold as a separate module. These modules include all the processes mentioned previously but it is up to the customer to decide which processes are implemented and taken into operation.

The tool is easily maintainable and software is easy to update. The configurations stay in place in updates. The tool has Efecte Platform as a base for the software and on top of it all the modules. Updating the platform is very straightforward and the updates do not affect the configurations. Any bigger changes to different modules have to be done by configuring each module itself. However, some basic changes can be made with updates. Every customer has different processes so it is impossible to run updates, which affects the processes without forcing customers to use predefined process models. Usually the customers have one admin user who can make some changes to the tool. This however does not need extra amount of work and is relatively easy. For smaller customers one to two days of consultation is needed and for bigger customers ten days maximum. Efecte has won many cases due to the fact that the tool is very easy to use and not as heavy as some of the bigger ITSM tools in the market.

The tool has pre-defined roles including many roles straight from the ITIL® framework. The roles are easily modified and customer specified roles are always defined during the implementation process. User views can be defined in many different levels (folder, item, field, CI). No technical knowledge is needed. Also the type of right can be defined (read, read & write, create/erase).

The implementation process is usually from 4 weeks to 12 weeks depending on how many modules are implemented. Usually the implementation starts with creating and defining CMDB and implementing Incident Management and Request Fulfilment (ICT

Webshop). Later, the rest of the Service Desk processes and Change Management will be implemented. It is suggested that processes are implemented one by one to avoid a situation where the organization is not able to use all processes efficiently. The implementation requires a project manager and one to two employee from the customer organization. Efecte's partners do consulting on the processes and provide other training, for example ITIL® V3 Foundation. Efecte provides training for the tool.

Efecte uses two kinds of license agreements. The customer can choose either a perpetual license or subscription license with continual invoicing for the services provided.

Integration with other applications is done through XML interface. The tool can be integrated with other ITSM solutions, especially Incident and Request Fulfilment processes.

The tool's user interface is fully web based. Efecte does not currently offer a SaaS solution, but this option will be available in the future. The reporting functions of the tool are easy to use and the main transactions are made in the tool. Reports can be also printed and exported to Excel for later analyzing. Attachments to incident records are done via attaching documents to the tickets. Reports are easy to create by searching and listing the information needed. Out-of-the-box reports are provided as constant and those have had good feedback. New reports are easily formed without any coding experience. The admin user defines which reports are seen in different roles. The tool provides archiving of the old reports and none of the data is deleted.

The tool defines different tasks, e.g. incidents, with type and priority according to ITIL®. The tool has pre-defined critical factors which can be re-modified in the Service Desk use. The tool provides unique logging and allocating for all tickets and has a link to CI records and reference between them.

The tool provides the Efecte Visualizer tool for documenting the infrastructure items and their relationships to each other with a possibility to drill down to each CI. The monitoring of component performance and usage levels against customer defined thresholds in done via an integrated third party tool; the tool itself does not have a tool for this. Also a remote control option is configurable to the tool, but the tool does not include this option. A discovery tool is provided as constant and workflow engine is built inside the tool. The workflow engine provides a function for task management

where the tool suggests the next steps for the process. The visual workflow option is not available.

The tool includes a self-help option with FAQ and knowledge base. The tool does not include any self-learning portal but Efecte's main goal is to design the product to be as easy to use as possible. However, the many fields do include extra information about what they should include and the customers are happy with this.

Comments:

- Efecte uses two kinds of license agreements. The customer can choose either a perpetual license or subscription license with continual invoicing for the services provided.
- The tool is provided as an out-of-the-box solution as much as possible, with little configuration.
- The implementation process is usually from 4 weeks to 12 weeks depending on how many modules are implemented.
- Reports are easy to create by searching and listing the information needed. Out-of-the box reports provided and customization allowed.
- The tool provides the Efecte Visualizer tool for documenting the infrastructure items and their relationships to each other with a possibility to drill down to each CI. A discovery tool included in the tool.
- Target customers are mid-sized companies with over 500 employees.

6.5.2 Customer, Tieto-Tapiola

Interviewee: Aki Holma

Version: Efecte v5.3.

Tieto-Tapiola was founded in 1974. Tieto-Tapiola is owned by Tapiola Group and the Tapiola mutual pension insurance company Etera. Tapiola Group offers insurance, bank, savings and investment services. Tieto-Tapiola is an ICT firm that provides efficient and high quality data processing services. (Tieto-Tapiola. 2011.)

The tool was acquired for ITSM use to support the entire company and its operations. The previous tool served only certain parts of the company and therefore a better and wider tool was needed.

The implementation process started in January 2010 but with a slow start. The actual implementation process started in June and was at full speed in November. The first processes were implemented later that year. All modules were bought and slowly adopted one by one. At first Incident, Problem and Change Management processes were implemented and CMDB was formed. Also Request Fulfilment was implemented within the first processes. Actually Incident Management and Request Fulfilment were the most important processes at the beginning. Problem Management is not yet in full operation but will be soon.

The main reason why the tool was chosen was the user-friendly user interface and innovative look and feel of the tool. Also the ability to use the tool in Finnish was seen important.

So far the tool has met most of the expectations and has been working well. No customization is used and this has led to a few technological challenges due to the demanding needs of the company. These are however minor challenges and can be solved together with Efecte. The tool is noticeably more flexible than the old tool. The old tool had too much customization and in the end it did not work properly. It was very difficult to control and updating was impossible. Tieto-Tapiola made a decision to start everything from scratch by implementing a whole new tool.

Tieto-Tapiola had processes defined prior to the implementation at some stage. Some polishing of the processes was made during the implementation but the tool was mainly acquired to support current processes. Also services were defined in a deeper level during the implementation.

The implementation process needed one fulltime project manager, admin user and a few consultants from Efecte. Training of the tool took two weeks for the most critical users. After Efecte trained the main users, Tieto-Tapiola had training sessions provided for the rest of the employees. Efecte provides learning material but it is modified to match in-house practices. The employees have not had any problems adopting the new tool to use.

Tieto-Tapiola is continually training their employees on ITIL® V3. ITIL® V3 training sessions were started in fall 2010 and currently 40 of the 400 employees are ITIL® V3 certified. In practice it has been shown that there are many benefits when employees are trained in ITIL®. One is having a common language which means that employees

understand better why something is done. Also, the implementation process is faster. ITIL® has been in use also earlier, but not at the same level.

Tieto-Tapiola has had some minor problems during the implementation but those are mainly related to another IT environment than the tool itself. First of all too many modules were implemented at the same time, which caused problems. The Change Management module requires relationships to many different places meaning it took time and planning to fully make it work. Also in-house SQL creations have caused some problems but these are not really related to Efecte. Some automatic e-mailing system related problems have occurred which mainly affects the employees in the Service Desk.

The relationships between different processes in the tool are working fine. There are direct links between the needed processes. CMDB is only partially in use. Currently only workstations are kept up to date but later also other CIs will be added to CMDB. CMDB is working nicely at the moment and especially the CMDB visualizer is good. Tieto-Tapiola uses the discovery tool, which is part of Efecte and also SCCM connector.

Tieto-Tapiola does not use the basic reports provided in the tool. All reports are modified in-house and report modification is easy once it is learned. Reports are easily modified for different roles. All users have ready-made dashboard views and admin-users are trained to make specialized views.

The access rights are easy to define but care must be taken. The wider the tool is, the more challenging it is to define access rights. Tieto-Tapiola is trying to keep it simple and Efecte's consultants are helping with this issue.

The tool has helped the overall decision making because the tool collects all information to one location. The tool provides very good commenting and feedback possibilities. Managing resources has been a lot easier than previously and the tool has decreased the amount of extra work.

Especially the modification possibilities of the tool are good. These include the definition of the parameters, forms and fields. Updates do not upset the configurations and no customization is needed. Email tickets are automatically inserted into the system. ICT Webshop, which was developed with Efecte as a pilot, has received a lot of good feedback.

Comments:

- The tool was acquired for ITSM use to support the entire company and its operations.
- The processes implemented are Incident, Problem and Change Management, Request Fulfilment and CMDB.
- The implementation process started in January 2010 but with a slow start. The actual implementation process started in June and at full speed in November.
- Tieto-Tapiola does not use the basic reports provided in the tool. All reports are modified in-house and report modification is easy once it is learned. Reports are easily modified for different roles. All users have ready-made dashboard views and admin-users are trained to make specialized views.
- CMDB is only partially in use. Currently only workstations are kept up to date but later also other CIs will be added to CMDB. CMDB is working nicely at the moment and especially the CMDB visualizer is good. Tieto-Tapiola uses the discovery tool, which is part of Efecte and also SCCM-connector.
- The tool has helped the overall decision making because the tool collects all information to one location. The tool provides very good commenting and feedback possibilities. Managing resources has been a lot easier than previously and the tool has decreased the amount of extra work.

6.6 HP

HP is the largest technology company in the world, one of the largest software companies and #10 in fortune 500. It is a global company operating in over 170 countries worldwide. HP products include IT infrastructures for companies, daily consumer items such as computers and printers and software among others. (HP 2011.)

The HP Service Desk Manager introduced in this thesis is part of their Business Technology Optimization (BTO) software family. BTO is an approach to IT management and a category of software and services supporting that approach. (HP 2010.)

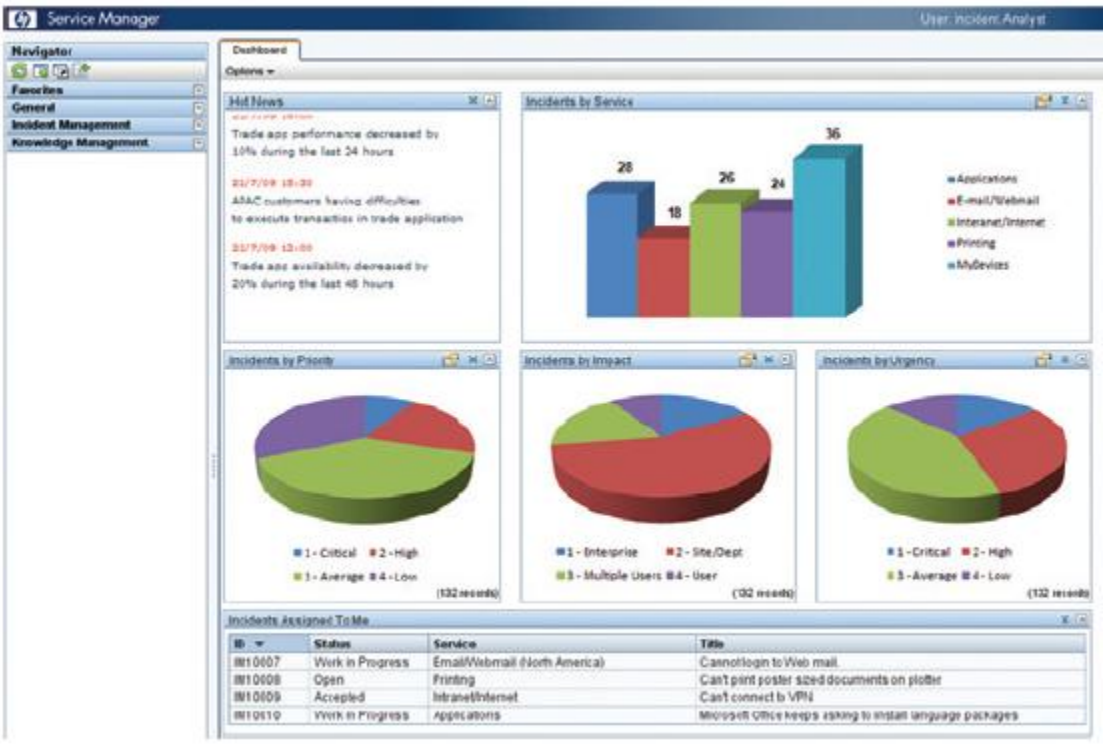

Figure 10. HP Service Manager

6.6.1 Vendor, HP

Interviewee: Mikä Jämsen

Version: HP Service Manager 9.2

HP is the vendor of HP BTO software in Finland.

The HP Service Manager complies with ITIL® V3 terminology and workflows. HP also took part in developing ITIL® V3. The HP Service Manager has 10 processes in gold level in OGC's ITIL® Software Endorsement Scheme (Office of Government Commerce 2011b). The same processes are also certified by PinkVERIFY™ V3.1 (Pink Elephant 2011d).

Most of the technical employees, pre-sales personnel and consultants in HP are ITIL® certified. Outside of these groups, there is no need to have ITIL® certified personnel. HP also organizes ITIL® V3 training courses in Finland.

The solution is designed mainly for enterprise level companies or generally large companies due to the scale of the solution. It is possible however that only the core

module of the solution is sold to smaller companies to support the basic processes and functions of IT.

It is generally preferred that the solution is bought as out-of-the-box to be configured to match the organizations processes and systems. It comes off cheaper and easier for both the customers and the vendor. It is possible to customize the product if needed, but this is not recommended as it generally causes problems in version updates.

The core module of the solution that is the most basic form, the service desk, includes basic processes such as incident and problem management and CMDB. There are several additional modules that can be incorporated in this including change management and service catalogue, for example. A unique element in HP's solution is that it actually includes two CMDBs always: one is included in the core module of the solution, the other one in a separate module integrated in the solution. This allows superior control over changes done in the CMDB and tracks the actual state and the managed state of a configuration item as defined in ITIL® processes.

The implementation project is started out to get the quick-wins first. This means the processes the customer deems the most important and easiest are implemented first, generally one process at a time. The full implementation of the basic processes can take from three to six months. The implementation project becomes longer as more processes are taken into consideration. HP expects strong commitment from the customer both in terms of staffing and IT resourcing. The success of the project depends on the customer a lot. HP brings, for example, one to two consultants into the project and, if special skills are required, more personnel from HP's resource pool. On top of providing the tools for the customer project, HP has capabilities to offer also ITIL® process consulting. And, HP has many partners, which are specialized in process consulting.

HP provides training for the tool for main users and admin users. They then train the end users in their own organizations. It is possible to have either customer specific or public training. Workshops are a possibility also for customers where a day is spent learning and practicing the use of the technology.

As for the upkeep of the tool, the closer it is to the out-of-the-box settings, the easier updating and patching is, although it does require some extra work. However customizing will make this noticeably more challenging. The HP license includes an upkeep charge that includes support services and updates.

Role based authorization is provided in the tool. The tool has its own database for users, but it is more common to integrate LDAP to the solution. Readymade roles are ITIL® based and are used by customers with some tweaking.

Buying the license always provides the customer with several environments, one of which is the operation environment. User licenses can be divided into authorized license and floating. Big number orders gain a bulk discount and enterprises have a possibility of buying a big selection of HP products and deciding which ones to use.

The HP solution provides open integration interfaces that can be used for business applications or other tools the customer needs. Common integrations done by HP include, for example, SAP and Active Directory.

The user interface is generally web-based. However, it still is possible to get Windows client from HP as well. Software as a Service at HP is seen as a way of the future and it is becoming more common, as customers are more willing to pay for the service versus investing in the licenses, hardware and staffing.

The HP Service Manager has its own reporting systems that are capable of fulfilling the needs of the customers. There are several out-of-the-box reports and they can be modified. The built-in reporting is complemented by the option to use Crystal reports on the Service Manager data. History search is provided if there is need for archiving.

Ready integrations between different processes are provided in the solution. All tickets have unique log IDs and links to CI records. The Visual CMDB supports this thinking as it is possible to view the entire CMS with it.

Comments:

- Buying the license always provides the customer with several environments, one of which is the operation environment. User licenses can be divided into authorized license and floating.
- The implementation is preferred as out-of-the-box to be configured to match the organization’s processes and systems. The implementation project is started out to get the quick-wins first.
- The full implementation of the basic processes can take from three to six months. The more processes taken into consideration, the longer the implementation project.

- Includes HP's own reporting system that includes several out-of-the-box reports and they can be modified. The option to use Crystal reports on the Service Manager data.
- Includes two CMDBs always: one is included in the core module of the solution, the other one is a separate module integrated in the solution. This allows superior control over changes made in the CMDB and tracks the actual state and the managed state of a configuration item. The Visual CMDB allows viewing of the entire CMS.
- Target customers are enterprise level companies or large companies. Full ITIL® lifecycle support.

6.6.2 Customer, KELA - The Social Insurance Institution of Finland

Interviewee: Juha Rimpiläinen

Version: HP Service Manager 7.11

KELA is a government institution of social insurance. They provide basic social security for all persons residing in Finland. (KELA 2009.)

KELA acquired the tool to standardize their IT service management processes and as a ticketing system for the service desk. Prior to acquiring the tool, an old IBM ticketing system was in place that needed replacement. To standardize the ITSM processes the ITIL® framework should be used as a guideline.

The HP service manager core module was acquired and Incident Management and Change Management processes have been implemented. Request Fulfilment is currently under consideration. Problem Management was previously implemented also, but it was found too complicated due to the workflow and thus given up.

It was felt that the service desk should be the only contact point so a tool was needed that could offer this capability. The Incident Management process was deemed as the most critical process. Change Management was also considered important. However the single most important reason to get a new ITSM tool was to replace the old system fast. Quick implementation was needed for the new system. Being a government organization KELA has to follow certain rules when buying a new solution. The price was one of the factors here, but not the most important one.

So far the tool has been working as expected. It is a versatile product that has been able to fulfil the needs. There have been some complaints about the user interface of the solution. However, the version will be updated soon and the Windows client will be replaced with the web interface of the new version. The tool has been customized to fully suit the needs of the organization and this especially in the case of Change Management. The customization process has required extra work, especially during updates, and it will be important to make sure it stays stable.

The implementation project was started in 2005. This means ITIL® v2 was used as a guideline. The process definitions were done after the tool was purchased, but before the implementation began. Consulting from outside was used during the implementation project. Still, this has been an ongoing project and the processes have been polished and improved continuously.

The implementation project started in the beginning of 2005 and finished in May 2006. This was the time when Incident Management went in production. The project employed 5 fulltime employees with some additional assistance depending on the needs. It took longer than it should have as several mistakes were done in the early phases of the project. KELA acquired the HP Service Center and IBM interface "IRM Accelerator (IRMA) with pre-defined processes and consulting. This system did not suit the organization in any way and the users did not like it. After this the project was restarted and the processes included were the HP Service Center out-of-the-box processes with in-house configurations and development. Eventually eleven months later the pilot was started with this solution.

Admin users were in product training first for a basic course of the product and later on for each module that was implemented. The end-users were then trained in-house. ITIL® training was very limited in the beginning of the project, but has been increased later on. The idea is that all IT staff should have attended at least a basic ITIL® course if ITIL® is used in the organization. This creates a common language across the whole organization and makes communication easier.

One major problem with the tool came up with Problem Management. It was considered too complicated and work-intensive by the employees. It was therefore dropped after the implementation and a new simpler way to do it was found.

The process and service definitions have been challenging and have required extra work. Also from a technical point of view the future development of the solution can be

challenging. The program itself is stable, but the code feels old. This can be seen in the functionalities of the program as they are spread wide in the code, which makes customizing and development challenging. Differences between the modules also create challenges during this kind of development. Customizing also tends to create problems for the updating of the program. Some bugs have also been noticed in the program, in particular, in the Change Management module.

The integrated relationships in the tool work well. Change tickets can be created from incident tickets and it is working fine. The problem ticket creation was found difficult however and is not in use anymore. CMDB works fine although there is no automated tool in use to populate it with data at the moment. The data in there includes workstations and some applications, but it has to be inserted with different means and is most likely outdated.

The reporting functions of the tool are not used as they were found to be limited and did not fulfill the needs. Crystal Reports is used instead and it works perfectly well with the tool. Dashboards come with a big variety, the new version includes an even bigger selection, and data handling is generally good as it can be brought in from many sources. The problem lies with the admin tools that are old and require updating.

The Access Management tools in the solution provide good possibilities of limiting access with folders or module basis. However in KELA this is not used at the moment.

The tool has been found to be very useful and important especially for data gathering and in incident resolution. Crystal Reports is used in analyzing the data and that is where the full benefits of the gathered data are realized.

Comments:

- KELA acquired the tool to standardize their IT service management processes and as a ticketing system for the service desk.
- The Incident Management and Change Management processes have been implemented. Request Fulfilment is being considered at the moment. Problem Management was previously implemented also, but found too complicated because of the workflow and thus given up.
- The implementation project started in the beginning of 2005 and finished in May 2006.

- The reporting functions of the tool are not used as they were found to be limited and did not fulfill the needs. Crystal Reports is used instead and it works perfectly well with the tool.
- CMDB works fine although there is no automated tool in use to populate it with data at the moment. The data in there includes workstations and some applications, but it has to be inserted with different means and is most likely outdated.
- The tool has been found to be very useful and important for data gathering and in incident resolution. Crystal Reports is used in analyzing the data and that is where the full benefits of the gathered data are realized.

6.7 IBM

IBM is one of the largest technology and software companies in the world operating globally. They have been pioneers in the industry over the years. Their offerings include products and services for both consumers and companies. (IBM 2011a.)

Tivoli software family is IBM's service management brand that consists of several different products all built in the Tivoli Maximo workflow solution. The IBM Service Manager consists of several products that are all licensed separately. The main products are Tivoli Service Request Manager or TSRM, the service desk module supporting the basic processes: Incident Management, Problem Management, Change Management, Release Management, Service Management, Knowledge Management, Request Fulfilment and Access Management; and CCMDB which supports Service Asset and Configuration Management. Other products exist to support other ITIL® processes such as TAMIT for IT assets and TSLA for Service Level and Capacity Management. (IBM 2011b; IBM 2011c.)

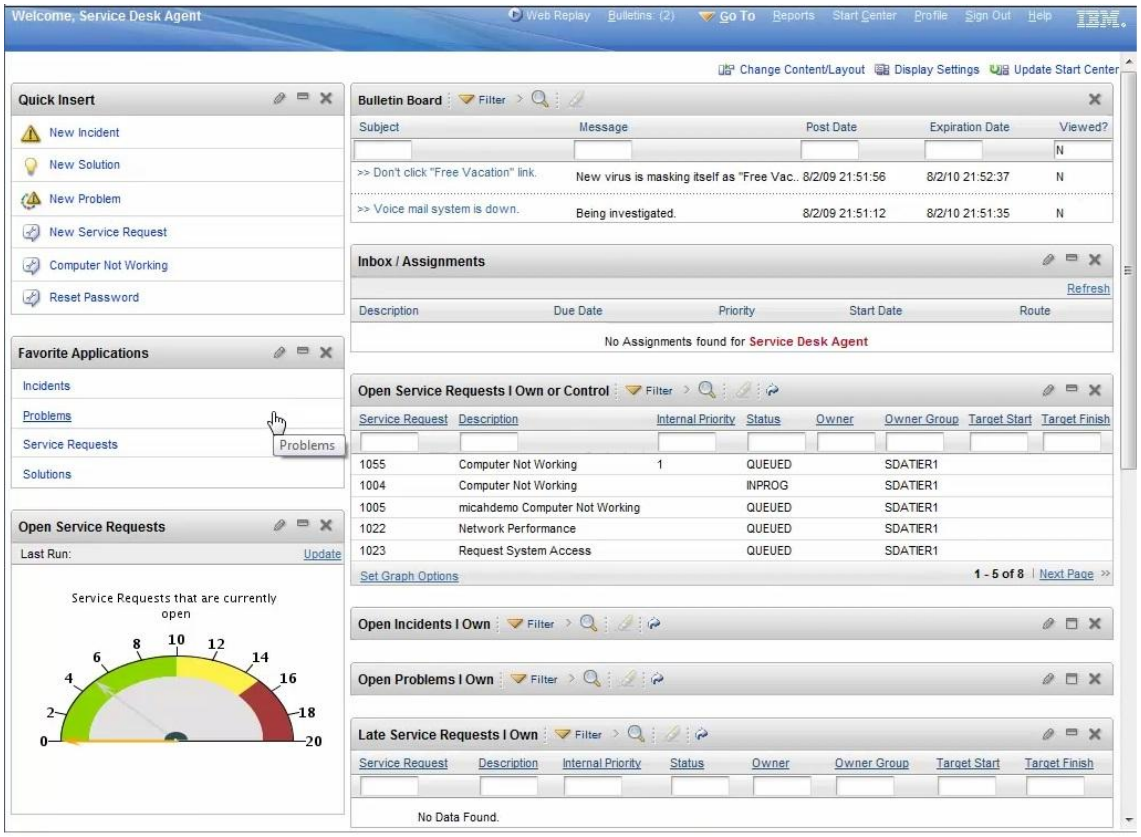

Figure 11. IBM Tivoli Service Request Manager

6.7.1 Vendor, MATERNA – Information & Communications

Interviewee: Jouko Suihkonen

Version: IBM Tivoli Service Request Manager v7

The MATERNA group was founded in 1980. MATERNA is an IT service provider that employs more than 1300 employees across Europe. The company is among the leading independent service providers in Europe's information and communication technology sector. MATERNA provides innovative solutions, products and services that are employed in business and public administration as comprehensive solutions or as solution models. (MATERNA – Information & Communications. 2011.)

The IBM Service Manager is ITIL® V3 compliant.

MATERNA is very much driven by ITIL® and almost all of their employees are ITIL® Foundations certified. They are also an Accredited Training Organization (ATO) of ITIL®.

The tool has 11 processes certified by PinkVERIFY™ V3 and 3 processes on gold level in OGC's ITIL® Software Endorsement Scheme (Pink Elephant 2011c; Office of Government Commerce 2011b).

The target customers for IBM's solution are large companies with over 1000 employees. This is for the main product. However, there are smaller express solutions that are possible for smaller organizations. The express solution only covers the basic Service Desk processes.

The solution is always configured for the customer's requirements and needs. A new and rising trend has been however that even larger companies have been adopting basic processes such as Incident Management as much as an out-of-the-box solution as possible. The smaller express solutions are more out-of-the-box generally.

The implementation project usually includes only the processes that the customer organization needs. The maturity level of the organization also plays a part in what processes can be fully implemented now and what needs more work. A Service Desk implementation generally takes between two and three months from process development to production. Workflow development requires more time and is usually completed in the second phase of the implementation project. The more changes and configurations are needed the longer the implementation project generally is. Standardized and linearized processes are much faster to implement.

Design is the key for successful implementation project. The processes should be defined before choosing the product. A roadmap for identifying the current situation and where to be in the future should be created by the customer.

MATERNA provides a project manager for overseeing the implementation project and consulting. The customer organization usually needs to provide at least one full time technical employee to work on the project. However the larger the implementation project is the more resources the customer needs to allocate for the project. Operational skills transfer is provided for customers teaching them to use the product during the implementation project. Training can also be customized for the customer's needs and products.

A role based access control is implemented in the tool. This is easily configurable for the needs of the customer organization. There is an add-on for a service providers supporting multi-tenancy.

The software license for the product is a fixed charge including 12 months upkeep, including patches and version updates, and user licenses, concurrent or authorized. The express solution is a fixed charge license. All products mentioned earlier are licensed separately.

Tivoli offers several integration possibilities for business applications. The Tivoli Directory integrator offers database integration possibilities. The Maximo Workflow solution that all IBM Tivoli products are built on offers full integration between all IBM products.

The IBM solution has only web interface. No Windows client. IBM offset Software as a Service possibility by themselves and through their partners. This however varies from country to country.

The reporting functions are handled with Cognos that offers ready reports and allows good modification and configuration possibilities.

CCMDB includes TADDM (Tivoli Application Dependency Discovery Manager) that collects the information from the IT infrastructure including hardware and software details and their dependencies. The solution includes the CI Topology Viewer that allows visualization of CI relationships and dependencies. TADDM includes a visual view to the discovered CI environment.

Comments:

- The software license for the product is a fixed charge including 12 months upkeep, including patches and version updates, and user licenses, concurrent or authorized. The express solution is a fixed charge license. All products mentioned earlier are licensed separately.
- The solution is always configured for the customer's requirements and needs. A new and rising trend has been however that even larger companies have been adopting basic processes such as Incident Management as much out-of-the-box as possible.
- The Service Desk implementation generally takes between two and three months from process development to production. Workflow development requires more time and is usually completed in the second phase of implementation project.

- The solution includes Cognos Business Intelligence that offers ready reports and allows customization.
- CCMDB includes TADDM (Tivoli Application Dependency Discovery Manager) that collects the information from the IT infrastructure including hardware and software details and their dependencies. The solution includes the CI Topology Viewer that allows visualization of CI relationships and dependencies. TADDM includes a visual view to the discovered CI environment.
- The target customers are large companies with over 1000 employees.

6.7.2 Customer Case

Customer not completed due to lack of time.

6.8 Requeste

Requeste is a software family developed in Finland by Sysart. It includes IT Service Management, IT Asset Management and CMDB solutions. Sysart's competence is in the areas of IT service management, customer service solutions, and solutions that enhance research and development. They serve customers from both the public and private sector. (Requeste 2011.)

6.8.1 Vendor, Sysart

Interviewee: Petri Mäenpää

Version: Requeste 4.7.2

The vendor and developer of Requeste is Sysart. It was founded in 1999 and their first software delivery was in the year 2000. Other products, in addition to Requeste, support quality control and network services among others. (Sysart 2011.)

All terminology is ITIL® V3 compliant in the solution. It adheres to the basic principles of ITIL®. The ITIL® trained employees in Sysart work in consulting and implementation projects. The solution has no certifications in PinkVERIFY™ or OGC's ITIL® Software Endorsement Scheme. They are not deemed necessary in Finland.

The processes supported in the solution include Incident Management, Problem Management, Change Management, Service Asset and Configuration Management, Service Level Management and Knowledge Management, possibly others also to a lesser extent.

Common customers for Sysart's solution include medium sized companies who have a need for automation in their IT services or other departments. They also have customers from the public sector such as towns and municipalities.

The products are always configured according to customer needs and desires. The strength in the solution is that configuration is done with a configuration interface provided with the solution. It provides an easy, yet reliable way for achieving this. Configurations done through the interface are assured to stay in place during updates, whether just a patch or a version update. Authorization and security are handled through roles. It is well configurable for customer needs.

The core product in the solution is the Service Desk that provides the most basic processes. It can then be expanded with other products providing additional functions and possibilities e.g. CMDB.

The implementation project starts with the processes the customer wants to have and what they have already in use in some way or another. On average a project will take more than one month to complete. The fastest project Sysart has completed was one week. Longer projects will take up to six to nine months of time. The biggest factor affecting how long the project will take is how well the customer organization is prepared for the implementation. If there are no processes defined, or in use in any way, it will naturally take longer. Other factors include the size of the company and the number of processes they wish to implement. Sysart does process consultation. The resources customers need for the project vary greatly, but a main user group assisting in the configuration is needed.

Sysart provides training for the solution also, usually for the main users who then train the end users in the customer organization. It is possible, although uncommon, for Requeste to train the end users, as well.

The license model is a fixed charge based on implementation with user licenses, either floating or authorized and upkeep charge. The other option is SaaS that is the implementation project and the user licenses.

Requeste provides an open interface for integrating other applications. Most common ones that they have are usually Active Directory and SCCM. Integrations are sometimes customized. This fully depends on what the customer wants to integrate with Requeste.

Requeste provides both a web-based interface and the Windows client; web-based is more common, but a Windows client is said to have better user experience. Requeste can also be bought as a Software as a Service, which is becoming popular.

Requeste comes with its own report generator. This includes ready reports and the ability to configure them after training. This is not viewed as an important part in the implementation project, but rather later on. It also provides archiving possibility for older tickets.

CMDB is often populated with Microsoft SCCM that can be integrated with the product. Requeste has no solution of their own for this. There is also no visual view of CMS.

Comments:

- The license model is a fixed charge based on implementation with user licenses, either floating or authorized and upkeep charge. The other option is SaaS that is the implementation project and the user licenses.
- The products are always configured according to customer needs and desires.
- On average an implementation project will take more than one month to complete.
- Requeste comes with its own report generator. This includes ready reports and the ability to configure them.
- CMDB is often populated with Microsoft SCCM that can be integrated with the product. No visual view of CMS.
- The target customers are medium sized companies and public sector such as towns and municipalities.

6.8.2 Customer, Oulun Tietotekniikka

Interviewee: Lotta Saarensilta

Version: Requeste 4.4.4

Oulun Tietotekniikka is a municipal corporation producing IT services to the city of Oulu and the nearby municipalities. They provide consulting services and IT design, development and implementation projects for their customers. They also provide client management and IT infrastructure services. They serve around 9000 customers. (Oulun Tietotekniikka 2011.)

Requeste was acquired to replace the old ticketing system in 2008. Support functions and request fulfilments were expanded to cover the entire organization. One of their aims was to improve the electronic services provided for the customers.

The acquired solution includes modules for incident, problem, change, configuration and knowledge managements. The implemented processes at the moment are only incident management and configuration management with knowledge management in the early phases.

Being a municipal corporation Oulun Tietotekniikka has to follow the public procurement regulation. The criteria were based on price and quality points set in the contract. In general, they have been satisfied with the product.

Before the implementation project the process definitions were based on ITIL® v2. It took 3 months to implement the solution with 10 people working on it. All personnel were provided a basic course on ITIL® and training for the solution before the implementation, during it and after it as well. There were no major problems during the implementation project. As there are only incident management and configuration management processes in use no experiences exist from the integration inside the tool itself.

The reporting functions of the solutions are deemed difficult thus they are not used. Reporting is done with a 3rd party Business Intelligence solution. No experiences exist from the dashboards and data handling capabilities in the tool as they are not used. Populating and updating the CMDB is also done with a 3rd party solution. Access rights are found to be easy to use in the tool.

The decision making process is supported by the tool in the form of provided data. The data the tool provides is exported to a Business Intelligence tool for analyzing.

Comments:

- Requeste was acquired to replace the old ticketing system in 2008. Support functions and request fulfilments were expanded to cover the entire organization and to improve the electronic services provided for the customers.
- The processes implemented at the moment include only incident management and configuration management with knowledge management in the early phases.
- It took 3 months to implement the solution with 10 people working on it.

- The reporting functions of the solutions are difficult to use so thus not used. Reporting is done with a 3rd party Business Intelligence solution.
- Populating and updating the CMDB is also done with a 3rd party solution.
- The decision making process is supported by the tool in the form of provided data. The data the tool provides is exported to a Business Intelligence tool for analyzing.

6.9 Service-now.com

Service-now.com was founded in 2004. The company provides a modern SaaS IT Service Management application with a vision to provide an ERP solution for IT. Service-now.com's ITSM solutions are offered via the Internet and modern software as a service. The license model is simple and economical based on the subscription. The ITSM solutions are ITIL® based and they are provided on a single extensive development platform. (Service-now.com. 2011.)

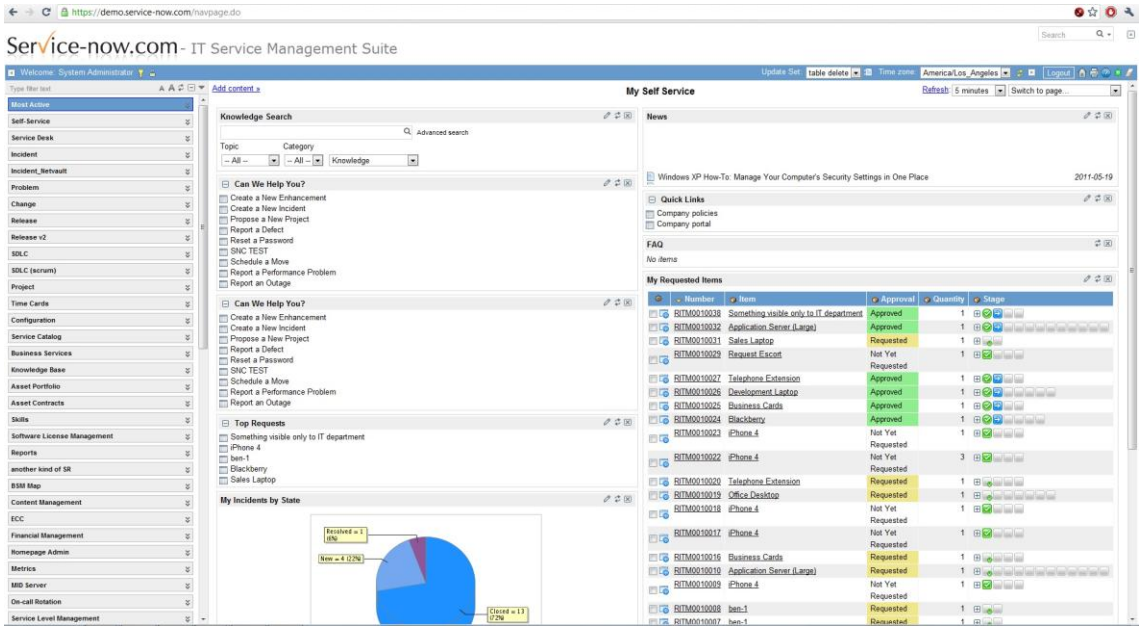

Figure 12. Service-now.com

6.9.1 Vendor, Sofigate Oy

Interviewee: Jori Kanerva

Version: Service-now.com, Winter 2011 Release

Sofigate Oy was founded in 2003. The group includes Sofigate Oy, Sofigate Services Oy, Sofigate Tampere Oy and ICT Standard Forum Oy. The company is specialized in ICT management and development. Sofigate has developed The ICT Standard for Management and it has become the de-facto standard in the ICT field. Sofigate offers a fully comprehensive ICT Management service that is particularly aimed at medium-sized businesses. The service provides an easy and flexible way to implement ICT Management professionally according to real business needs. (Sofigate Oy. 2011.)

The Service-now.com ITSM tool was created during ITIL® v2 in 2005. Therefore the tool is fully ITIL® compatible and nowadays also ITIL® V3 compatible. The tool uses ITIL® V3 process terms and aligns to workflows fully. Out of 80 employees 15 have been certified on ITIL® V3 Foundation and 18 more will be certified soon. Sofigate has completed training on ITIL® with all the persons who need it.

Service-now.com has 11 processes certified in PinkVERIFY™. The other processes are not certified because it has not been necessary to do so.

The tool is best suitable for medium-size to large organizations. Sofigate provides ICT Dashboards that runs as a service on their end for small and medium-size organizations. The ICT Dashboard is based on Service-now.com.

It is possible to use the tool as an out-of-the-box solution with only a small amount of configuration. Generally an organization's needs are wider than just what ITIL® says, so it takes time to apply the software for the needs. Service-now.com has a well-defined process for the implementation and Sofigate also uses this model modified for their purposes.

There are two solution models available namely enterprise and professional. The enterprise model offers all available processes and modules whereas the professional model is mainly a service desk tool. It is possible to implement only the processes that are needed. Sofigate offers upkeep for the tool but the customer can also handle everything by itself. When choosing Sofigate's SaaS option Sofigate handles everything.

The tool provides role-based security on menu level, where the data is either offered or hidden from the users. Data security is handled on database level. It is also possible to define the settings for internal and external users separately. Generally internal

users have access to almost everything, if they know the path but external users have always limited access.

Generally the implementation project takes two to three months to complete depending on the amount of processes implemented and how much designing needs to be done. The software installation takes five to ten days. Service-now.com has pre-defined implementation plans and templates. Usually the implementation process requires one service owner, project manager and admin user from the customer company. These can be shared roles.

Sofigate provides training for the customer organization. In the beginning of the implementation project a pilot group is trained and after this the rest of the staff. It is up to the customer how much training the organization need from Sofigate.

The software licensing agreement is very straightforward with a minimum of 35 licenses for the organization. These are the main or admin users of the company. The end users are always free. For smaller companies Sofigate offers their own SaaS option with possibilities to have fewer licenses in use and the possibility to outsource the whole operation to Sofigate.

The tool provides a very wide scale of pre-defined integrations with business applications. It is also possible to integrate with another ITSM solution to ensure fluent use in a multi-vendor environment.

The tool does provide a fully web-based user interface with a SaaS function. Service-now.com is only provided as a SaaS.

It is possible to attach any files as an attachment to the incident records. Data can be printed and imported to Excel very easily for later analyzing. The tool includes pre-defined reports, which can be modified easily. The tool also provides the possibility for archiving reports and data but this has never been requested from Sofigate.

The tool does not include a discovery tool but has possibilities to integrate one. The tool includes a visual CMDB analyzer and Business Service Management view.

Comments:

- The software licensing agreement is very straightforward with a minimum of 35 licenses for the organization. These are the main or admin users of the company. The end users are always free.

- It is possible to use the tool as an out-of-the-box solution with a small amount of configuration.
- Generally the implementation project takes two to three months to complete depending on the amount of the processes to be implemented and designing that needs to be done.
- The tool includes pre-defined reports, which can be modified easily.
- The tool includes a visual CMDB analyzer and Business Service Management view.
- The target customers are medium to large organizations.

6.9.2 Customer, Cargotec Corporation

Interviewee: Inga Rantanen

Version: Service-now.com, Winter 2011 Release

Cargotec Corporation was formed in June 2005 when Kone Corporation demerged into two companies, Cargotec and New KONE. Kone Corporation's load handling (Hiab), container handling (Kalmar) and marine cargo handling (MacGREGOR) form Cargotec. Cargotec provides solutions to load and unload goods in material flow hubs, such as ports, terminals and distribution centres. The company also provides cargo handling solutions for marine and offshore operations and local transportation. (Cargotec. 2011.)

The tool was originally acquired as a Service Desk tool with possibilities to expand in the future. The most important processes for Cargotec were Incident, Problem and Change Management. Cargotec has Incident Management, Service Level Management, Reporting and Asset Management in use. The Self Service portal is currently in pilot use. The Problem and Change Management processes will be implemented in the future.

The main reason why the tool was chosen was the support for the SaaS option. The tool seemed to be very easy to use and user-friendly. The tool included all the processes that were needed now and in the future. The SaaS option was important due to its simple licensing model and the fact that there is no need to maintain servers or the technology. The tool was also very mature and ready to use almost

immediately. Cargotec's aim was to go as much as possible for the out-of-the-box model to avoid any radical configurations.

The tool has fulfilled Cargotec's vision, even better than they expected. The tool has been used even more widely than originally planned. There has not been anything that they could not do with the tool and expanding to other processes has been problem free. Their biggest problem seems to be that there are not necessarily enough technical persons available to help Cargotec. This is due to the fact that Service-now.com is rapidly enlarging its market share and continually getting new customers.

The basic maintainability of the tool is handled in-house but some of the more special jobs are done together with Sofigate's consultants. The learning curve has increased very fast during working with the tool and in the future it is possible that outside consultants are not needed. The only challenge with the tool is that it is a comprehensive one and offers lots of different solutions, which makes it difficult to know everything at the beginning. Basic modifications are easy to do.

The new ITSM tool was needed because the organization did not have any actual tool in use and the different regions used different tools. There was a need to harmonize the technologies and operations on a global level. The processes were defined prior to the implementation. Before there were no global working practices and every location had their own practices. The tool requirements were considered carefully before choosing the tool.

The processes were defined in March 2010. The tool was introduced to Cargotec in April 2010. Cargotec organized workshops and testing regarding the tool in June and July. In August the tool was in production.

Sofigate provided early training and Service-now.com provided the rest of the training including admin training. The training was basically for region admins and end-users were trained in-house. In-house material was provided after the training.

Cargotec arranged ITIL® V3 training for all employees who took part in the project. The training was a one-day intensive course because it has been shown that not everyone in the organization needs the full ITIL® V3 training. Cargotec's employees have 20-30 ITIL® V3 Foundation certificates out of 140 employees and one service manager.

Many problems during the implementation and operation were avoided as most of the risks were listed prior to implementation and were known well. Also the use of three separate environments, development, test and operation, ensured that many problems were detected in the early phases. No technical problems or bugs have occurred, only some minor problems with integrating AD with the tool. Of course some opposition to change is ever-present to some extent. One problem has also been that the supplier has limited resources, as the tool is gaining popularity.

Service-now.com is integrated with AD and to one other ITSM system. Integration between SAP and the tool is forthcoming in the future. The integration between different processes is working well and there are no challenges.

CMDB is only partially in use with the services listed. Cargotec is planning to put all master data in CMDB but this is challenging due to the multi-supplier environment. Auto-discovery tool is the only option here.

The reporting functions are good in the tool; however, all reports are modified for Cargotec's use specifically. It needs understanding and experience to create and modify but it is relatively easy to learn in time. Dashboards are only in limited use currently but Cargotec will start using them more in the future. Also CMDB is in limited use and Cargotec does not have deeper knowledge about it yet.

The out-of-the-box roles are flawed and all roles are in-house modified. There are some deficiencies in the pre-defined roles. However it is relatively easy to modify them in-house.

The tool has enabled a better way for following the suppliers, gaining information and understanding the suppliers. Also the processes are now connected in the organization. The tool seems to be the best in the markets, as it is very well constructed and mature.

Comments:

- The tool was originally acquired as a Service Desk tool with possibilities to expand in the future. There was a need to harmonize the technologies and operations globally.
- The processes in use are Incident Management, Service Level Management, Reporting and Asset Management. The Self Service portal is currently in pilot

use. The Problem and Change Management processes will be implemented in the future.

- The processes were defined in March 2010. The tool was introduced in April 2010. Workshops and testing regarding the tool was arranged in June and July. In August the tool was in production.
- The reporting functions are good in the tool; still, all reports are modified for Cargotec's use specifically. Understanding and experience is needed to create and modify the reports but this is relatively easy to learn in time.
- CMDB is only partially in use with the services listed. Cargotec is planning to put all master data in CMDB, but this is challenging due to the multi-supplier environment. The Auto-discovery tool is the only option here.
- The advantages Cargotec have gained with this tool include a better way for following the suppliers as well as a better way for gaining information and understanding the suppliers. Also, the processes are now connected in the organization.

6.10 Summary

This section highlights certain significant findings in the interviews. See also appendices 6 and 7 for summary tables for all the tools as well as highlights from the interviews.

Altogether nine tool vendors and eight tool customers were interviewed. The IBM customer is not included due to the lack of time from the customer's part.

Functionality

All of the reviewed tools are integrated toolsets for IT Service Management suites, introduced in 3.6.8. This means that they support a wide variety of processes and all of the process modules are directly integrated with each other. This is an important functionality for customers as it simplifies the handling of incidents, changes, problems and other tickets. CMDB is generally at the heart of the solution. This allows integration between the CIs in the CMDB to the incident and other tickets. This is needed especially for larger organizations for handling their IT infrastructure effectively. A visual CMDB tool, provided by all except Requeste, helps the users understand the relationships and hierarchy in the IT asset.

A web-based user interface is the standard in the market now. The most common web browsers support them. Only HP, BMC Remedy and Requeste provide services for Windows clients along with web clients. Admin tools are still commonly provided for the Windows client for greater versatility. All other tools apart from Altiris and Efecte provide Software as a Service (SaaS) option. Efecte will be providing it in the future.

The customer organizations do not commonly use the pre-defined reports. This is mainly because every organization has different needs and the reports have to be modified to support their processes. In general, the tools helped the organizations' ability to support decision-making in many ways. This is achieved with the tools by collecting important information to one location after which analyzing the information becomes easier.

Since this research is made for Finnish markets, one noticeable aspect is that only Efecte and Request are providing a tool that is fully supported in the Finnish language. In addition to these, DataCenter and Sofigate also provide tools in Finnish language, if required by the customer.

Implementation

The customer experiences from the tools and implementation differed a great deal. While all tools are integrated ITSM suites the amount to which this functionality was used varied greatly. In some cases the tool was in very limited use and the advantages of the integrated modules remained scarce. CMDB is not as widely used as it could be in most cases.

The implementation project was generally several months long with a major part of the time going to process development and process implementation in the customer organization. The tool itself can be implemented fast, but to get the organization embrace and use it takes time.

The maturity level of the customer organization's processes affect the implementation time. In many cases the customer organizations had defined their processes in some level, but they had to adjust the processes to fit the tool in their organization. The experiences reveal that it is easier to make adjustments to both the tool and their processes to gain better performance. This was mainly done because in some cases it was easier to change the working processes than make a huge customization to the

tool. The experiences also indicate that the processes need continual improvement to keep them up-to-date and efficient.

The interviews also show that in many cases the opposition to change was more difficult to handle than the actual implementation of the new tool. Nowadays the ITSM tools are highly ITIL® compliant, which makes them more complicated when comparing to old working habits. Some employees are not willing to change their working habits and they do not understand the benefits that the improved processes bring for the organization.

7 Conclusions

This section discusses the findings of the interviews and relates them to the ITIL® framework theory. The interview results are compared to each other to find similarities among them. These findings are then compared to what ITIL® has to say about the same topics to find out what the reality is and how the companies are coping with adopting the ITIL® best practices.

7.1 Trends in Market

The interviews highlighted some trends regarding the tools' functionality as well as their implementation. These trends are briefly discussed here.

7.1.1 Product Functionality

Essentially all of the products explored have equal functionality when it comes to supporting the most common Service Desk processes such as incident management. Most of these tools have PinkVERIFY™ or ISS certifications to guarantee their support for the ITIL® best practice processes. The only products without either of these are Efecte and Requeste. This already indicates that in terms of functionality the products in the market are very similar. The same is also noted in Gartner's 2010 Magic Quadrant for IT service desk (4.3). The real differences between the tool functionalities only come out in the more challenging and less common processes. Some of the smaller vendors might have some support for certain functionalities, but not in the same way as the biggest vendors who have specialized products catering to every possible ITIL® process.

7.1.2 Out-of-the-box Processes

All organizations have their unique working ways and processes. This generally leads to configuring the product to fit the customer's needs. Many of the vendor interviews show, however, that it is common for customers to try to incorporate processes as much out-of-the-box as possible and in this way achieve the ITIL® best practice models in the organization. It seems that the organizations trust the processes and workflows the tool vendors have designed to the extent that they are trying to adopt them as directly as possible.

Another noteworthy characteristic is that many customer organizations involved themselves in adapting their processes, as much as possible, according to ITIL®

already prior to implementing the tool. This had many beneficial effects and eased the implementation process significantly when both parties were using the same language. The ITIL® framework has been adopted widely in all kinds of organizations and it was present at least up to a certain level. Usually the processes in the customer organizations are not fully ITIL® compliant, but in many cases the use of ITIL® processes will be concretized when the tool is implemented. This was also the case with Tieto-Tapiola (6.5.2).

Gartner's Magic Quadrant (4.3) makes a case that this style of adopting the processes directly may slow down the development of working ways and process maturity in the organizations as they merely adopt a ready-made best practice without thoroughly considering it.

7.1.3 Software as a Service Popularity

All vendors who provided Software as a Service (SaaS) functionality for their products noted that it is growing fast and becoming increasingly popular, with the exception of DataCenter who reported that SaaS from Axios Systems had not been so popular among their customers. The tools with the SaaS functionality include Service-now.com, IBM, BMC Remedy, HP, CA Technologies, Axios Systems and Requeste. This leaves Altiris and Efecte as the only ones not currently offering SaaS. However Efecte is planning to introduce the SaaS option in the future. The popularity of SaaS is noted in Gartner's Magic Quadrant for IT Service Desk also (4.3).

7.2 Why Buy IT Service Management Tool

ITSM tools are brought into a company to increase the effectiveness and efficiency of the operations. It can provide the needed data to improve the service quality and automate the services to provide cost savings and possibly increased productivity. The tool however has to be capable of fulfilling the needs of the customer organizations. This topic was discussed in section 3.1 from the evaluation perspective.

One of the easily forgotten reasons why an ITSM tool should be acquired is the data it can provide for the organization. The improvement of service provision and quality requires information. The ITSM tools can provide data from various sources in the IT infrastructure that can be used to develop the services further. The data that these tools can provide should be collected into one location where it is easily accessible and analyzable. After the data is transformed into knowledge it can be used to improve the service operations in the organization. There is more thorough discussion about why

this data is important in Continual Service Improvement (section 2.7) and Service Strategy (section 3.3.2) and the technological aspects of providing data for Continual Service Improvement in section 3.7.

The cases in the customer interviews can be divided into two categories according to why they started to look for a new ITSM tool. The first group had no solution at all or only a simple ticketing system, while the second group already had some kind of ITSM solution, but it needed updating.

The customers who had no actual ITSM solution were DataCenter (6.2.2) and Academica (6.1.2). They were small companies with limited operations. It was possible to support these operations with a very simple in-house designed solution, e-mail or a tool that was not meant for this purpose, but was to a certain extent capable of supporting it. In each of these cases, however, the companies were growing and as their operations became more complex and demanding they understood the benefits of an ITSM solution to support and automate some operations and assets management.

The other case in these interviews was the group whose tool had simply become outdated. The tool was either too limited to support the needed operations as was the case in National Land Survey of Finland (6.3.2) and KELA (6.6.2) or the development of the tool had become too demanding like in the case of Tieto-Tapiola (6.5.2). With Cargotec (6.9.2) the case was that the different parts of the global company were using different tools and there was a need for one tool to support all of their daily operations globally. A common element in all of these was however that one solution was needed to support the complicated operations of these larger organizations.

7.3 How to Find Information on IT Service Management Tools

There is a wide selection of IT Service Management tools in the market. This thesis already covers nine tools. So how should an organization be able to decide what tool they should pick? Information about them can be found from a great variety of sources such as Internet, consultants, tool vendors themselves and many other places. This thesis introduces PinkVERIFY™ (4.1), ITIL® Software Assessment Scheme (ISS) (4.2) and the Magic Quadrant for IT service desk from Gartner (4.3) as sources for finding objective information about the tools.

PinkVERIFY™ and ITIL® Software Assessment Scheme certify ITSM tools based on how well the processes in the tools support the ITIL® framework model. These should be used to see which tools indeed have all the processes the organization requires. It

does not provide a complete view of the ITSM tool market as not all tool vendors have certified their products. The interviews showed that both of the Finnish tool vendors (Efecte (6.5.1) and Requeste (6.9.1)) had not certified their products. They had been considering PinkVERIFY™, but had not seen it beneficial, as Finnish customers do not commonly ask for it.

Gartner's Magic Quadrant for IT service desk (section 4.3) provides a different view of the tools. It focuses only on enterprise level solutions so the view it provides, much like ISS and PinkVERIFY™, is limited. The tools are required to support all the basic service desk processes, but it categorizes them based on their economic, product and marketing capabilities. The tools in the leader and challenger categories are most certainly very good products and companies with plenty of resources behind them.

7.3.1 ITIL® Compatibility of the Tools

If the organization wants to adopt ITIL® practices in the organization along with a new ITSM tool one has to note that almost all tools in the market, at least all tools discussed in this paper, claim to be ITIL® V3 compatible.

As mentioned before, PinkVERIFY™ and ITIL® Software Assessment Scheme measure the ITIL® V3 compatibility of the tools. This is the most objective information that can be received from this topic. These certifications mean that the tool is ITIL® V3 compatible in the certified process. The table illustrating these certifications can be found in Appendix 1.

The lack of these certifications does not mean that the tool is not ITIL® compatible, however. This can be down to many reasons such as the high cost of certification or the lack of popularity in the market area, both noted above. ITIL® provides a very good basis for designing the processes for the tools with its best practice processes. And even if the tool does not fully support an ITIL® process out-of-the-box, this does not mean that the organization could not design their processes based on ITIL® and configure the tool to support this.

7.4 What to Look for When Buying an IT Service Management Tool

The first thing to do while planning to get an ITSM tool for the organization is to find out which processes are the most important ones for the organization. A tool should be selected to support the most critical processes and the processes that provide quick wins for the organization. However it is not just the critical processes that should affect

the decision regarding the tool, but also the processes that might not be implemented now, but will be later. It is important to pick out a tool that will provide possibilities of expanding the ITSM support and develop service management further. The ITIL® Service Design book introduces the concept of MoSCoW (section 3.1), where the organization categorizes the tool requirements into groups as a Statement of Requirements (SoR). The groups the requirements are put into are what they must have, what they should have if possible, what they could have and what they won't have now, but would like to have in the future. ITIL® books have covered the technological aspects of each process under each lifecycle. This should be used to understand all the different aspects that will need to be taken into consideration when looking at different ITSM tools.

The customer interviews supported the idea of buying a tool that supports more processes than is needed in the immediate future. Most of them had the plans ready to implement the processes in future. How the implementation project will be handled should be decided upon before buying the tool to know which modules will be bought.

As mentioned in section 3.1, an important aspect to consider is also the creditability of the vendor and the tool. It must be ensured that the vendor is still operating after a year's time. The past track record of the supplier needs to be checked and usually it is safer to choose a tool that has existed a long time in the markets and has a loyal user base. This is indication that the vendor is still providing support for the tool later. Section 3.1 also provides two checklists that need to be taken into consideration during the evaluation and selection of a tool to make sure all the requirements are met.

7.4.1 Integration

Integration is an important aspect to keep in mind. All IT organizations already have a wide selection of software currently in use. Not all of them have to be or even should be integrated into the ITSM solution, but integrating some of them will bring certain advantages. The most common integrations that came up in all vendor interviews were AD and LDAP integrations and some discovery tools such as SCCM. It seems that AD and LDAP integrations were relatively common and easy for most tools although not altogether problem free. Tool integration can however be a challenging task and in many cases it is. Deciding to integrate other tools in IT Service Management suites has to be carefully planned in advance. In many cases it leads to the customization of the ITSM tool, which may well end up creating problems for version and patch updates

and customization always becomes more expensive than out-of-the-box and configuring solutions. These integrations can bring improvements to the organization e.g. by integrating the business applications to the ITSM systems the organization can improve service provision and handle the costs more effectively. Gartner's Magic Quadrant (4.3) notes that tool vendors will most likely say that the integrations the customer desires can be done, but the question is at what cost or how well will they work.

7.4.2 Size of the Organization and the Tool

The size of the organization should influence the decision to buy an ITSM tool. Depending on the size of the organization it is important to research the benefits of having their own ITSM system. Does a small company really need it or would it be more cost-effective to outsource it to somewhere. Out of the tool vendor interviews for this paper, Sofigate, Academica and DataCenter provided this possibility and were running operations for several SMEs.

If the organization decides to acquire a solution is it better to acquire a solution with a wider service scope provided by e.g. Requeste or a complete enterprise level solution offered by BMC Remedy? Small organization in most cases do not need all the possible modules the enterprise level solutions come with, but in many cases they provide some kind of a more limited solution for SMEs. The needs that smaller organizations have for an ITSM tool can differ greatly from those of large organizations.

There are certain advantages to working with a small tool vendor as well. A tight relationship is possible with a smaller vendor and the customer, as is the case with Tieto-Tapiola and Efecte (section 6.5.2). The vendor and the customer were developing the tool together bringing benefits for both. Efecte gained important customer information continuously and Tieto-Tapiola was able to give the tool vendor their inputs on how they viewed the tool. However a big tool vendor is most likely in a better position to guarantee support and continuous development of the product in the future.

7.4.3 Cost and Licenses

The licensing models for the tools have to be well understood when buying one. The total costs of the tools must be clear to everyone so that the costs will not come as a surprise to anyone. ITIL® Service Operation talks about this topic (section 3.2) and

explains the different licensing models. All tool vendors had two kinds of user licenses, authorized and floating ones.

An additional problem with the costs related to the tools comes from SaaS. The upfront SaaS may seem much cheaper to buy, as it does not include the heavy initial costs of the on-premises solution. However the difference reduces with time. This is why the costs need to be planned and well understood before purchasing the solution. Gartner's Magic Quadrant (section 4.3) refers to this point, as well.

7.5 How to Ensure Implementation Project is Successful

The implementation process starts after an appropriate tool is selected. An appropriate tool for the organization is a tool that meets most of the organizations requirements. Like mentioned in section 7.4 the checklists introduced in section 3.1 are vital for selecting process. If most of these requirements are met, the implementation process is more likely to be a success. In many ways the situation after the selecting process can be considered as the starting point for the real work. Before implementing the tool the hardware platform needs to be prepared and the software loaded. Usually the software installation is done in a short time and the most important work is done before and after the installation when data population needs to be considered and the processes need to be defined.

In many ways today's SaaS solutions, as discussed in section 7.1.3, ease the implementation process. These solutions do not require hardware or software installation, which allows faster implementation. These types of solutions will still require planning and implementation, but it should be more simplified and faster.

A successful implementation process is dependent on how the implementation is done regarding how well the requirements are fulfilled, the amount of testing capabilities, design of the implementation, the maturity of the organization and processes, training provided before, during and after the implementation, implementation methodology, and whether the tool support the processes.

The fulfilment of the requirements can be divided to the following three levels: *out-of-the-box* solution, where the requirements are fulfilled, *configurable* solution, where the tool needs some configuration to fulfil the requirements, and *customization*, where the tool needs to be reprogrammed to fulfil the requirements. Customizations usually need to be repeated with every product upgrade.

In most cases it is recommendable to avoid customization due to the high costs incurred at product update. It may also be difficult to get support for highly customized tools and many vendors do not support old releases. The previously mentioned requirements are introduced in the Service Design book and in section 3.1.

Nowadays vendors prefer to sell most of the tools as an out-of-the-box solution with a reasonable amount of configuration to fit the organization's requirements. All of the tools discussed in section 6, are provided as previously mentioned. Organizations should choose a tool that can be implemented as much as possible as an out-of-the-box solution. It is a safer and a cost-effective option for both sides. Customization should always be avoided because it includes many risks, as mentioned in section 3.1. The whole system is more likely to crash and recovery times are usually much longer. Another big issue is that version updates are more difficult to handle with customized tools and require more additional work.

The tools selected for this research are usually provided as a whole Service Desk solution or as a wider ITSM suite, which includes all the processes and modules that the vendor provides as constant. Even though the organization is willing to implement all the processes and modules they have selected, it is recommendable to do so step by step. This means that the organization should only implement the most critical processes first and slowly expand to the other processes. The implementation time is directly affected by how widely the tool is planned to be implemented. The general recommendation that was evident in the vendor cases is that the organizations should begin from the most basic processes, such as Incident Management. Also the size of the organization affects the implementation time and therefore the resources should be well defined to ensure that the implementation process is completed in the defined time estimations. If the tool is acquired for wider use, it is recommended in the vendor cases that the implementation process be started with creating and defining the CMDB contents.

It is recommended that the tool have separate environments for development, test and operation. Thorough development and testing of the tool reduces risks and errors at later stages. The implementation process is more likely to be successful, if the risks and errors are well known and avoided before going into live operation as discussed in Cargotec's case in section 6.9.2.

It seems very clear that the design of the implementation process is the key for a successful implementation project. This should be done even before the tool is selected by defining the processes in the organization. A roadmap of the current situation and where to be in future should be created. It is important to collect all background data needed beforehand to avoid any delays with the implementation process. The vendor cases indicate that the customer organizations should provide as big an input into the implementation project as possible because the success of the project is directly affected by the level of support. The flow of activities, allocation of tasks, need for information and interactions need to be clear and all parties need to understand their tasks as discussed in section 3.3.

The maturity of the customer's organization and IT processes and the amount of resources and working all affect the length of the implementation project. If processes are not defined or used, the implementation will take longer. It needs to be defined what, where from, how and when the implementation is done. Timing is extremely important and resources must be available to ensure success. The implementation project should not be scheduled to take place during a known busy period, such as year-end processing as discussed in section 3.1. A good method for defining the maturity of the organization is to define it together with the supplier. This ensures that both parties know the challenges that may occur during the implementation. Additional information on defining the organization's maturity level can be found in appendix 5 The Service Management Process Maturity Framework.

The significance of training was in section 3.2.4 under timing of deployment. It should be well defined how much training the company needs. The customer should be ready to provide staff to assist the supplier's consultants in general things. The suppliers provide training for the tool usage and in some cases also for the processes. It is recommended that the customers have the needed amount of knowledge about the processes and how the processes are done efficiently. A good way to gain deeper knowledge about the processes is to take part on ITIL® V3 training. This ensures that the collaboration with the supplier is easier and common language is used. The experiences from the Section 6.3.2 discussed ITIL® V3 training in National Land Survey of Finland. In their experience ITIL® V3 training should be arranged again after the implementation to be able to apply what was learnt to practice. This should be done in order to make sure that everyone understands the benefits. Moreover, it needs to be kept in mind that usually when the tool his highly customized, also the

training for the tool becomes unavailable in the long run. The supplier may not support older versions and customizations later as discussed in section 3.1.

Some suppliers provide a specific implementation methodology that eases the process. The main point is to define the maturity of the customer and after this the implementation is done in clearly defined steps and within certain time limits and pricing. This came up in the cases regarding Axios Systems (6.2.1) and Service-now.com (6.9.1)

The majority of the implementation project is process consulting, to achieve the most benefits from the processes. Processes should be defined as far as possible prior to implementation and tool requirements must be considered carefully. Many problems during the implementation project can be avoided if the risks are well known and listed prior to implementation as seen in the Cargotec case (6.9.2). The processes should be simplified before automating them. Simplifying the process will reduce variance in performance.

The tool must support the business and processes, not the other way around. If the processes are well defined, the appropriate tool is easier to select and the implementation process is generally faster. Some polishing is always recommended and it does not end even after the implementation project.

The implementation project is more likely to end in undesirable results, if the responsibilities are not well defined, an appropriate design is missing and the benefits from the tool are not understood.

8 Discussion

The scope of this research is to provide a clear picture of the requirements stated in ITIL® V3 regarding to selecting, implementing and using of IT Service Management tools. This research also investigates two other assessment models and one research about the same subject. The assessment models are ITIL® Software Assessment Scheme and PinkVERIFY™, and the research is Gartner's 2010 Magic Quadrant for the IT Service Desk. This research also includes interviews with nine Finnish market vendors. However, only eight customer interviews were completed due to the lack of time from the part of one customer. The scope is to investigate the characteristics of the tool, implementation experiences and the functionalities of the tool.

While every effort has been made, within the timeframe available, to ensure that the information and conclusions are free of errors, they cannot be considered validated. The contents of this research should be used as a guideline or framework for research or project and it should be able to help in generating new ideas and thoughts. The information presented should be seen as a subjective research and not as an absolute truth.

The findings of this thesis should be used as a guideline for organizations implementing this type of a process. In many cases these guidelines can be described as common sense, but they tend to be forgotten during the implementation phase. The information provided in this thesis is useful for people who are looking for a new ITSM tool for their organization. This thesis highlights the requirements that must be kept in mind when starting the process from defining the organizations processes according to ITIL®, selecting an appropriate tool, implementing the tool and how the tool should be used to gain the most benefits from it.

As this research is limited to the technology requirements stated in ITIL® V3, related assessment schemes from ISS and PinkVERIFY™ and Gartner's 2010 Magic Quadrant for the IT Service Desk, more thorough research should be done next on other relevant models (e.g. COBIT). Also the vendor and customer cases were limited to just one interview per case. Therefore, a more thorough investigation about the tools and customer experiences is needed to get a wider view of today's ITSM tools. Future research could include more ITSM tools and concentrate more on the differences between the ITSM suites in the markets to obtain a more thorough view on which ITSM tool the customer organization should acquire.

The scope of this research was to investigate the ITIL® V3 compatibility, implementation and integration capabilities and the functionalities of the tools. Apart from integration, all these areas were successful. Integration proved very difficult to investigate and is, therefore, included in the implementation part. The scope was also to include ten different ITSM tools. One of them, however, was removed due to the lack of time from the vendor's side. The 10th tool selected in this research was an open source ITSM tool OTRS.

On the whole, this research was a success and the goals were met in a sufficient level. Only one ITSM tool and one interview with the customer of IBM were excluded in the process.

9 Summary

This thesis set out to review nine currently used IT Service Management (ITSM) suites in Finland. The purpose was to create a snapshot of the current situation in the Finnish market for ITSM tools. There has not been a similar research done in Finland in the past few years. The goal was meant to be achieved by identifying and compiling the recommendations IT Infrastructure Library (ITIL®) makes for these tools and by interviewing both the vendors about the functionalities and implementation of their tools and also a customer of each tool for their experiences in implementing and using the tool.

On the whole, this thesis succeeded in what it set out to achieve. Due to the nature of the research and a limited number of participants, this is a subjective and limited view of the market and the tools. To obtain a more thorough view of the market, a much larger research with more participants would be required. But as it is now, this thesis manages to cover the important topics relating to the planning of the purchase and implementation of an ITSM tool. A lot of what is covered here is what could be considered "common sense", but it is easy to overlook or forget some important things when a project is as big as these kinds of projects often are.

IT Infrastructure Library covers a great deal of material from the technological aspect. ITIL® does not make a direct recommendation as to what tool should be used, but rather recommends what aspects should be taken into consideration when planning and implementing a tool. It also lists what kinds of functionalities are required by the tool to be able to support the ITIL® best practice processes.

The ITIL® best practices are not directly applicable to an organization, but rather should be configured to fit into the organizational culture. This came up in the vendor interviews as tools are sold with ITIL® compatible out-of-the-box processes, but in every case they still had to be configured to fit the customer needs. The vendor interviews highlighted the full potential of the tools. The tools were able to support the ITIL® processes well and had a great deal of functionalities.

The customer interviews revealed that the full potential of the tool was not in use in any of the cases. This was particularly true in the case of enterprise level solutions. This is clear indication that very few organizations actually need support for so many processes in the first place. The organizations that do need support are generally very

large enterprises. The medium-size and large organizations can operate with fewer processes than the full ITIL® lifecycle would recommend. All of the customers explored for this thesis were using the processes that brought most value to them and were simple to implement.

The customer experiences from the implementation and use varied a great deal. In some cases the tool was in very limited use due to the fact that it had been implemented very recently or only very few processes had been implemented so far. In the other cases the tool was in wider use and the experiences from the basic functionalities were generally quite good. An exception was the reporting capabilities of the tools. In many cases it was not used as it was considered too limited or not suitable. In these cases the customers found using a 3rd party Business Intelligence tool more suitable for them.

To sum up, an organization planning to purchase an ITMS tool will do itself a great favour by having clear goals in mind regarding what they want from this tool and the process implementation project. Without clear goals the full benefits of these tools and process realignments will not be achieved.

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Appendix 1, Summary of Tool Assessments and Research

Table 2. Summary of Tool Assessments and Research. (Coyle, David M. et al. 2010.), (Pink Elephant. 2011c/d.)

Company/Tool	Gartner	ISS Gold Level	ISS Silver Level	ISS Bronze Level	PinkVERIFY™ 3.1	PinkVERIFY™ 3.0
Symantec/Altiris 7.1	–	–	–	–	–	IM
Axios Assyst 9	Niche player	–	–	–	–	–
Axios Assyst 7.5	–	–	–	–	–	AVM CHG EV FM IM KM PM REL RF SACM SCM SLM
BMC Remedy 7.0	–	–	–	–	–	AVM CHG EV IM KM PM REL RF SACM SCM SLM
BMC Remedy 7.6	Leader	CHG IM PM RF	–	–	–	–
CA Technologies r12.5	Challenger	CHG IM PM RF SACM	–	AVM CAP EV FM ITSCM KM REL SCM SLM SPM	AVM CAP CHG EV FM IM ITSCM KM PM REL RF SACM SCM SLM SPM	–
Efecte 5.3	–	–	–	–	–	–
HP 9.2	–	AVM CHG IM KM PM RF SACM SCM SLM SPM	–	–	AVM CHG IM KM PM RF SACM SCM SLM SPM	–
HP 7.11	Challenger	–	–	–	–	–
IBM Service Manager 7.0	–	–	–	–	–	CHG EV FM IM KM PM REL RF SACM SCM SLM
IBM Service Manager 7.1	Niche player	IM PM CHG	–	–	–	–
Requeste 4.7.2	–	–	–	–	–	–
Service-now.com Winter 2011 Release	Challenger	–	–	–	–	CHG FM IM KM PM REL RF SACM SCM SLM SPM

Table 3. List of Abbreviations for Summary of Tool Assessments and Research

AVM = Availability Management	CAP = Capacity Management	CHG = Change Management	EV = Event Management	FM = Financial Management
IM = Incident Management	ITSCM = IT Service Continuity Management	KM = Knowledge Management	PM = Problem Management	REL = Release & Deployment Management
RF = Request Fulfilment	SACM = Service Asset & Configuration Management	SCM = Service Catalog Management	SLM = Service Level Management	SPM = Service Portfolio Management

Appendix 2, Vendor Interview Questions

Scope

1. Does the tool use ITIL® V3 process terms and align to ITIL® V3 workflows and process integrations?
2. Do you have personnel trained in ITIL® V3?
3. Which ITIL® V3 processes are included in the ITSM technology? Which of these processes are already certified? (E.g. PinkVERIFY™ / ITIL® Software Scheme)
4. What kind of companies is the tool best suitable? (E.g. company size / field)
5. Is the tool an out-of-the-box / configurable / customizable solution?
6. Which modules are provided as constant and which are extra?
7. Is it possible to modify the tool to include only selected processes?
8. How easy is the maintainability of the tool? What factors affect to the maintaining process?
9. How is the security issue handled? Does the tool have security controls in place to allow only authorized staff and users to view, open, modify, authorize and close records based on their role?

Implementation

10. How long is the implementation project generally? What factors affect to the implementation process? (E.g. Company size / Distribution / Culture / Resources)
11. How much resource does the implementation require from customer point of view? (E.g. Personnel/Working hours)
12. Do you provide training for the customer organization implementing the technology?
13. What kind of software license agreement is used?
14. Does the tool provide integration with business applications? (E.g. Open interface / Database access)
15. How well does the tool suit in multi-vendor environment?

16. How are the relationships between different processes handled? For example can the tool generate problem or change from an incident?

Functionality

17. Does the tool support a web-based user interface?
18. Does the tool provide SaaS function?
19. How easy to use are the reporting functions in the tool?
20. Can the tool produce reports 'out of the box' without additional products or consultancy services? Including Service Level Achievements / Targets for services.
21. Does the tool facilitate the production of management reports from historical records?
22. Is it easy to identify and categorize different tasks with the tool? (E.g. The reason what caused an incident and where does it affect (type / priority))
23. Does the tool provide unique logging and allocating for all incidents / problems / RFC's and have a link to CI records and reference between them?
24. Does the tool provide function for documenting the infrastructure items and their relationships to each other? (Service Asset & Configuration Management)
25. Does the tool integrate with a Configuration Management System (CMS) / Configuration Management Database (CMDB) to enable the creation and maintenance of the linked relationships between Change Record(s) and associated Configuration Item (CI) Records?
26. Does the tool support Event Management process? E.g. facilitate the monitoring of component performance and usage levels against customer defined thresholds?
27. Does the tool provide self-help function / remote control / discovery / diagnostic / workflow / reporting & dashboard?

Appendix 3, Customer Interview Questions

Scope

1. What is the main purpose the tool was acquired for? (E.g. ITSM Suite / Service Desk)
2. Which modules are included in the ITSM tool? Which modules are in use and why?
3. Was something similar to ITIL®'s MoSCoW (Must-Should-Could-Would) used in deciding which processes are being implemented? What features were the most critical when choosing the tool? Did price of the tool play any part in the decision?
4. Has the tool fulfilled your expectations?
5. Have you changed tool recently? Why did you change to another tool?

Implementation

6. Did you have the processes defined prior to implementing the tool? Did you have ITIL® V3 terminology and workflow used in defining the processes?
7. How long did the implementation take? How much resources were used during the implementation? (Eg. Personnel/Working hours)
8. Did you have training from the company prior / during / after the implementation?
9. Did you have ITIL® V3 training in the organization before the implementation of the technology? Did you have personnel already trained in ITIL® V3?
10. Have you had any problems after implementing the tool?
11. How are the relationships handled between different processes? (E.g. Incident Management to Problem/Change Management.)
12. How is the integration between the technology and Configuration Management Database?

Functionality

13. How do you find the reporting functionalities of the software?

14. How do you find the data handling capabilities in the software? (E.g. Distributed data inputs, data views, dashboard)
15. Is keeping the Configuration Management Database up-to-date easy?
16. How are the access rights issue handled in the tool? (E.g. easy to grant new access rights, easy to limit access to certain data, etc.)
17. Does the tool support decision-making process? Is the information in an easily analyzable form? (E.g. dashboard)

Appendix 4, 7-Step Improvement Process

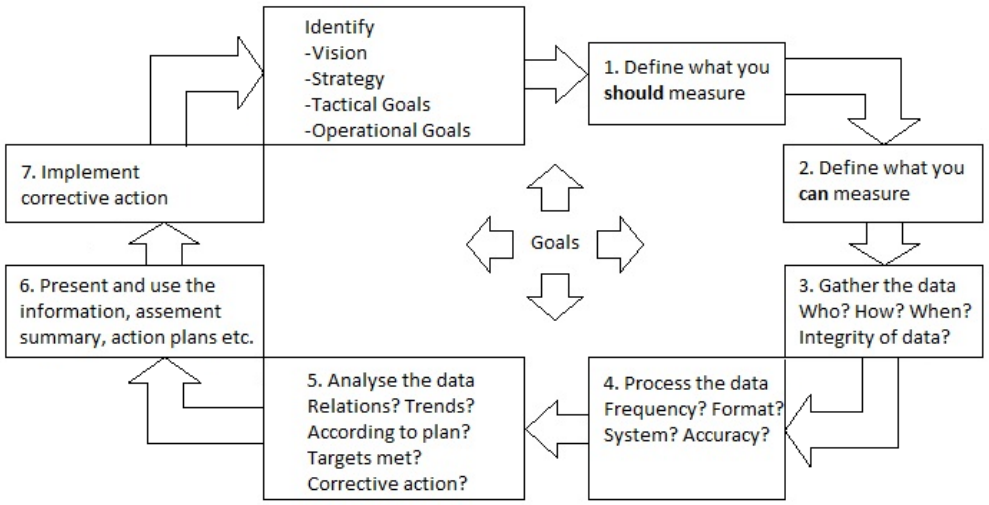

Figure 13. 7-Step Improvement Process (ITIL® V3 Continual Service Improvement 2007: 43.)

- Step One – Define what you should measure: Measurements should be driven by business requirements. (ITIL® V3 Continual Service Improvement 2007: 44.)
- Step Two – Define what you can measure: Measurements should be supported by SLAs. IT capabilities, business requirements and budget can limit what can be measured. (ITIL® V3 Continual Service Improvement 2007: 31.)
- Step Three – Gathering the data: The data should be gathered based on the objectives and goals identified earlier. (ITIL® V3 Continual Service Improvement 2007: 31.)
- Step Four – Processing the data: Gathered data is processed to consistent form. It needs to be aligned with defined objectives. (ITIL® V3 Continual Service Improvement 2007: 31.)
- Step Five – Analyzing the data: Compare the data to what defined objectives from step one. Data is transformed into information and eventually into knowledge. (ITIL® V3 Continual Service Improvement 2007: 50.)

- Step Six – Presenting and using the information: Knowledge is transformed into wisdom by presenting accurate picture of the results to various stakeholders with possible improvement efforts. (ITIL® V3 Continual Service Improvement 2007: 32.)
- Step Seven – Implementing corrective action: Use the gained knowledge to optimize, improve and correct services. These actions need to be communicated to the entire organization. (ITIL® V3 Continual Service Improvement 2007: 32.)

Appendix 5, The Service Management Process Maturity Framework

The process maturity framework (PMF) is an approach that has been used in the IT industry for a number of years. There are many proprietary models available and many organizations have their own. This PMF has been developed to ITIL® V3 framework to collect the best practice approach to review and assess the maturity of Service Management. This PMF can be used as a framework to assess the maturity of each of the Service Management process individually, but it can also be used to measure the maturity of the Service Management process as a whole. (ITIL® V3 Service Design 2007: 263.)

The stage of growth of the IT organization has a direct impact on the maturity of the Service Management processes. However, the maturity of the IT organization is not just dependent on the maturity of Service Management processes. The PMF have five levels, which are Initial, Repeatable, Defined, Managed and Optimizing. Each level in the PMF requires a change of a combination of elements to be fully effective. The following five areas require an assessment for the process maturity in each of the five levels: Vision and steering, Process, People, Technology and Culture. (ITIL® V3 Service Design 2007: 263.)

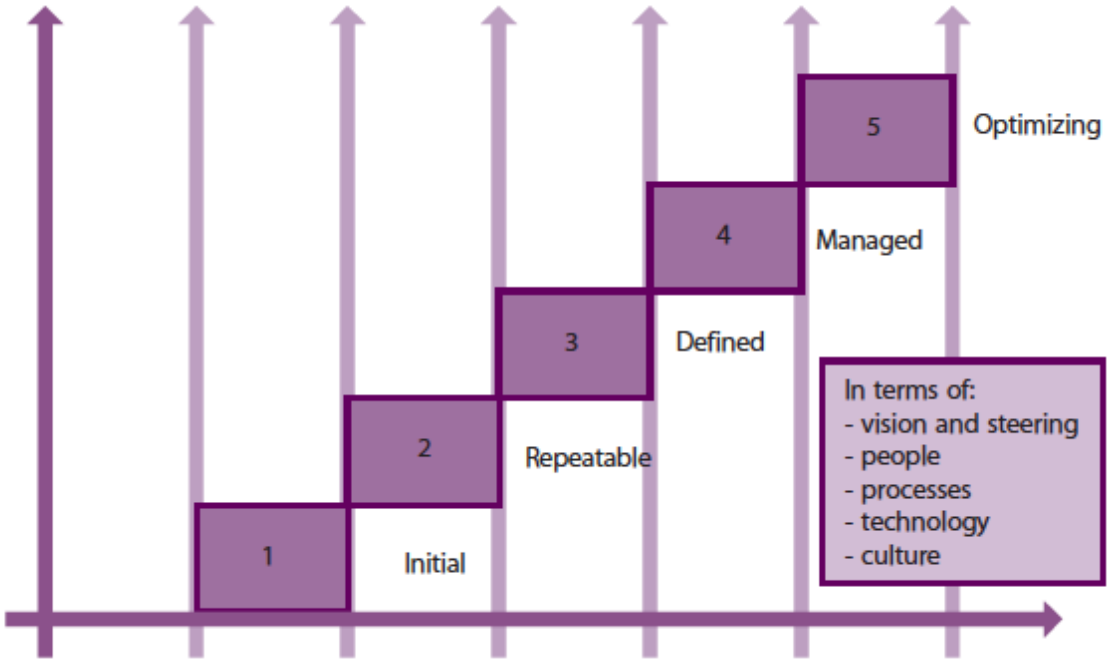

Figure 14. Process maturity framework. (ITIL® V3 Service Design 2007: 263.)

Initial, Level 1

Initial level is achieved when the process has been recognized but the management of the process is very little or missing. The process is allocated as a non-important process. (ITIL® V3 Service Design 2007: 263.)

Table 4. Requirements for Level 1. (ITIL® V3 Service Design 2007: 264.)

Initial (Level 1)	Requirements
Vision and Steering	Minimal funds and resources with little activity Results temporary, not retained Sporadic reports and reviews
Process	Loosely defined processes and procedures, used reactively when problems occur Totally reactive processes Irregular, unplanned activities
People	Loosely defined roles and responsibilities
Technology	Manual processes or a few specific, discrete tools
Culture	Tool and technology-based and driven with a strong activity focus

Repeatable, Level 2

Repeatable level is achieved when the process has been recognized and there is some management for the process. The process is allocated as an important process in some level. However, the activities related to the process are still uncoordinated, irregular and without direction. (ITIL® V3 Service Design 2007: 264.)

Table 5. Requirements for Level 2. (ITIL® V3 Service Design 2007: 264.)

Repeatable (Level 2)	Requirements
Vision and Steering	No clear objectives or formal targets Funds and resources available Irregular, unplanned activities, reporting and reviews
Process	Defined processes and procedures Largely reactive process Irregular, unplanned activities
People	Self-contained roles and responsibilities
Technology	Many discrete tools, but lack of control Data stored in separate locations
Culture	Product and service-based and driven

Defined, Level 3

Defined level is achieved when the process has been recognized and documented, but without formal agreement, acceptance of recognition of its role within the IT operations. (ITIL® V3 Service Design 2007: 264.)

Table 6. Requirements for Level 3. (ITIL® V3 Service Design 2007: 265.)

Defined (Level 3)	Requirements
Vision and Steering	Documented and agreed formal objectives and targets Formally published, monitored and reviewed plans Well-funded and appropriately resourced Regular, planned reporting and reviews
Process	Clearly defined and well-publicized processes and procedures Regular, planned activities Good documentation Occasionally proactive process
People	Clearly defined and agreed roles and responsibilities Formal objectives and targets Formalized process training plans
Technology	Continuous data collection with alarm and thresholds monitoring Consolidated data retained and used for formal planning, forecasting and trending
Culture	Service and Customer-oriented with formalized approach

Managed, Level 4

Managed level is achieved when the process has been fully recognized, defined, managed and accepted. The process is service focused and has objectives and targets. (ITIL® V3 Service Design 2007: 265.)

Table 7. Requirements for Level 4. (ITIL® V3 Service Design 2007: 265.)

Managed (Level 4)	Requirements
Vision and Steering	Clear direction with business goals, objectives and formal targets, measured progress Effective management reports actively used Integrated process plans linked to business and IT plans Regular improvements, planned and reviewed
Process	Well-defined processes, procedures and standards, included in all IT staff job descriptions Clearly defined process interfaces and dependencies Integrated Service Management and systems development processes Mainly proactive process

People	Inter- and intra-process team working Responsibilities clearly defined in all IT job descriptions
Technology	Continuous monitoring measurement, reporting and threshold alerting to a centralized set of integrated toolsets, databases and processes
Culture	Business focused with an understanding of the wider issues

Optimizing, Level 5

Optimizing level is achieved when all the previous requirements are met and the activities have become as part of the everyday activity and everyone is involved with the process. A self-contained continual process of improvement is established. (ITIL® V3 Service Design 2007: 266.)

Table 8. Requirements for Level 5. (ITIL® V3 Service Design 2007: 266.)

Optimizing (Level 5)	**Requirements**
Vision and Steering	Integrated strategic pans inextricably linked with overall business plans, goals and objectives Continuous monitoring, measurement, reporting alerting and reviews linked to a continual process of improvement Regular reviews and/or audits for effectiveness, efficiency and compliance
Process	Well-defined processes and procedures part of corporate culture Proactive and pre-emptive process
People	Business aligned objectives and formal targets actively monitored as part of the everyday activity Roles and responsibilities part of an overall corporate culture
Technology	Well-documented overall tool architecture with complete integration in all areas of people, processes and technology
Culture	A continual improvement attitude, together with a strategic business focus. An understanding of the value of IT to the business and its role within the business value chain

Appendix 6, Summary Tools and Vendors

Table 9. Summary of tools and vendors: Altiris and Academica, Axios Systems and DataCenter and BMC and MATERNA.

Vendor	Modules	Cost / Licenses	CMDB	Reporting	Implementation	Implementation length	Target customer
Altiris / Academica	Symantec ServiceDesk, Altiris Client Management suite, Altiris Server Management suite, Altiris Asset Management suite.	Fixed cost for the tool, implementation charge and a minimum of 5 expert or Service Desk user licenses for concurrent users.	CMDB can be populated with data from Client Management Agent. Can be viewed with a visual tool.	Own reporting engine. Pre-defined reports allowing customization. Additional IT analytics add-on tool to increase reporting possibilities.	Preferred to sell as an out-of-the-box solution, but as all companies have unique processes and workflows it does require a level of configuration.	Implementation project generally takes two to three months of time, majority of it being process consulting.	Midsized and large companies.
Axios Systems / DataCenter	Service Management Software (assyst) and IT Asset Management Software (ITAM).	License for the entire ITSM suite, including upkeep, servers and users. Two types of user licenses, floating and authorized licenses. Extra modules are separately invoiced.	The CMDB is at the core of the tool and visual CMDB impact explorer is provided with an option to drill down to each CI.	Out-of-the-box reports. Reports cannot be produced inside the tool. Reporting tool is needed for producing reports.	Provided as an out-of-the-box solution as much as possible. Configuration needed to fit the tool to customer. Customizing is not needed.	The implementation time varies from 10 to 75 days depending on the scope.	Midsized companies with personnel over 500. For smaller companies the pricing can be a critical factor.
BMC / MATERNA	BMC ITSM Suite. Other BMC products can be integrated to support wider selection.	License includes: application license i.e. Suite for the system delivery, including several separate environments (development, test and operation). Two types of user licenses, fixed and floating.	Asset Management where the infrastructure items and their relationships are shown in visual form.	~100 pre-defined reports (Crystal Reports). On top of these ARS includes ~50 pre-defined reports. (The customer can form reports with ARS).	Preferably sold as an out-of-the-box solution with little configuration. Start with an out-of-the-box situation and configure to support the operations of the organization.	Basic installation of the system takes up to one week but usually the whole implementation process takes two to three weeks of work time.	Up mid size to large organizations. The “minimum” workstations are generally from 200 to 400.

Table 10. Summary of tools and vendors: CA Technologies, Efecte and HP.

Vendor	Modules	Cost / Licenses	CMDB	Reporting	Implementation	Implementation length	Target customer
CA Technologies	Two different options: CA Service Desk Manager Analyst and CA Service Desk Manager Full. Other products can be integrated for more processes.	User licenses for concurrent users.	CMDB visualizer allows a visual view into the entire CMS. CA Configuration Automation is included in the solution to provide discovery functionality.	Includes Business Objects Enterprise XI as its reporting platform. ~200 out-of-the-box reports (ability to modify).	Key principle is out-of-the-box approach. Implementation needs configuration depending on the needs and the maturity of IT processes in the organization.	General time between 30 and 90 days. For the process to be used in full effect in organization it can take up to several years.	Midsized to large organizations.
Efecte	Service Desk, CMDB, Change Management. Other modules exist to support wider selection of processes.	Two kinds of license agreements: perpetual license or subscription license with continual invoicing of the services provided.	The tool provides Efecte Visualizer tool for documenting the infrastructure items and relationships with possibility to drill down to each CI.	Reports easy to form by searching and listing the information needed. Out-of-the box reports provided (allow customization).	The tool is provided as an out-of-the-box solution as much as possible, with little configuration.	The implementation process is usually from 4 weeks to 12 weeks depending on how many modules are implemented.	Midsized companies with over 500 employees.
HP	HP Service Desk Manager. Business Technology Optimization (BTO) software family products can be integrated to support other processes.	User licenses can be divided into authorized license and floating. Several environments included.	Two CMDBs: Core module of the solution and separate integrated module. Control over changes in CMDB, tracks the actual and the managed state of a CI. Visual CMDB allows view into the entire CMS.	Own reporting system, includes several out-of-the-box reports (allow modifying). Option to use Crystal Reports on the Service Manager data.	Preferably sold as an out-of-the-box, configured to match the organizations processes. Implementation project starts out to get the quick-wins first.	Full implementation of basic processes can take from three to six months. Implementation project becomes longer the more processes are taken into consideration.	Enterprise level companies or large companies.

Table 11. Summary of tools and vendors: IBM and MATERNA, Requeste and Service-now.com and Sofigate.

Vendor	Modules	Cost / Licenses	CMDB	Reporting	Implementation	Implementation length	Target customer
IBM / MATERNA	Tivoli Service Request Manager and CCMDB (Service Asset and Configuration Management). Other tools possible to integrate. Part of Tivoli product family.	Software license is a fixed charge including 12 months upkeep, including patches and version updates, and user licenses, concurrent or authorized. Additional modules are licensed separately.	CCMDB includes TADDM, collects the information from the IT infrastructure. CI Topology Viewer allows visualization of CI. TADDM includes a visual view to the discovered CI environment.	Solution includes Cognos Business Intelligence that offers ready reports and allows customization.	Configured for customer's requirements and needs.	Service Desk implementation 2-3 months from process development to production. Workflow development requires more time.	Large companies with over 1000 employees.
Requeste	IT Service Management, IT Asset Management and CMDB solutions.	License model is a fixed charge based on implementation with user licenses, either floating or authorized and upkeep charge. SaaS: implementation project and the user licenses.	CMDB is often populated with Microsoft SCCM that can be integrated with the product. No visual view of CMS.	Requeste comes with its own report generator. This includes ready reports and the ability to configure them.	Products are always configured according to customer's needs and desires.	On average a project will be over one month of calendar time.	Medium sized companies and public sector such as towns and municipals.
Service-now.com / Sofigate Oy	Two solution models: Enterprise and Professional. Enterprise model offers all available processes and modules. Professional model is service desk tool.	Minimum of 35 licenses (main/admin) for the organization. End users are always free.	The tool includes visual CMDB analyzer and Business Service Management view.	The tool includes pre-defined reports, which can be modified.	It is possible to use the tool as an out-of-the-box solution with small amount of configuration.	Generally the implementation project takes 2-3 months, depending on the amount of processes implemented and how much design needs to be done.	Medium to large organizations.

Appendix 7, Summary of Tools and Customers

Table 12. Summary of tools and customers: Altiris and Academica, Axios System and DataCenter and BMC Remedy and NLS Finland.

Customer	Reason to acquire tool	How widely the tool is used	CMDB	Reporting	Implementation length	Decision making
Altiris / Academica	To support their daily business operation, business functions and resource planning. Prior to acquiring the tool, Academica had no ITSM tool in use.	Basic service desk processes and CMDB.	CMDB has not been fully automated yet, has to be manually updated.	Reporting and dashboard capabilities, with Altiris IT Analytics solution.	In production with Altiris Service Desk in 2008. Implementation project was less than 2 months of active work.	Allows better understanding of the current situation in the organization, by automation and faster access to information.
Axios Systems / DataCenter	The tool was originally acquired for Service Desk use with an option for wider use later on.	CMDB, Incident, Problem, Change and Release Management.	The CMDB is easy to keep up-to-date but time consuming, the tool itself does not provide discovery tool.	Solution has 40-50 pre-conducted dashboard meters, which are used widely. Some reports are a bit modified and some additional reports were made with Crystal Reports.	The implementation process started in February 2009 and first pilot was ready in April 2009.	From the service provider point of view the tool is excellent.
BMC / NLS Finland	The tool was originally acquired for ITSM use to get more processes in daily operation. The old tool was used mainly to handle incidents.	Incident and Problem Management. Purchase management in use to control orders. Service Request Fulfilment for self-service needs. Service Level Management is in use with controlling service levels and for measuring response times. Asset Management partially used. Change Management in testing.	CMDB covers workstations and printers (software and license agreements are implemented in near future). LANDesk's discovery tool is used at nighttime and sometimes it is not working properly with CMDB.	Reporting functions are not used as much as desired. Problems with out-of-the-box reports. Reporting functions are dealt with searching the data and importing it to excel.	Implementation time was from January 2010 to June 2010.	The tool has not yet supported the decision making process but the expectations are that the benefits are wider after implementing the Change Management process.

Table 13. Summary of tools and customers: CA Technologies and Digia, Efecte and Tieto-Tapiola and HP and KELA.

Customer	Reason to acquire tool	How widely the tool is used	CMDB	Reporting	Implementation length	Decision making
CA Technologies / Digia	One unified tool was needed to standardize practices.	Incident management fully implemented. Change management project is currently underway.	As one of the reasons of starting to use ITSM tool was to support Asset Management, CMS is seen as an important project and will be the next one in line.	–	Project has been running for one year.	Benefit to customers and Digia in the future as the operations will be more effective and based on standardized products and ways of working.
Efecte / Tieto-Tapiola	The tool was acquired for ITSM use to support the entire company and its operations.	Incident, Problem and Change Management, Request Fulfilment were implemented and CMDB was formed.	CMDB is only partially in use. Currently only workstations are kept up to date but later also other CIs are being added to CMDB. CMDB is working nicely at the moment and especially CMDB visualizer is good. Uses discovery tool included in Efecte and SCCM-connector.	Not using the basic reports provided in the tool. All reports are modified in-house and report modification is easy once it is learned. Reports are easily modified for different roles. All users have ready-made dashboard views and admin-users are trained to make specialized views.	The implementation process started in January 2010 but with a slow start. Actual implementation process started in June and at full speed in November.	Has helped the overall decision making. Collects all information to one location. Provides good commenting and feedback possibilities. Managing resources has been a lot easier than previously and the tool has decreased the amount of extra work.
HP / KELA	Tool acquired to standardize their IT service management processes and as a ticketing system for the service desk.	Incident Management and Change Management processes have been implemented. Request Fulfilment is being considered at the moment. Problem Management was previously implemented also, but found too complicated because of the workflow and given up.	CMDB works fine however there is no automated tool in use to populate it with data at the moment. The data in there includes workstations and some applications, but it has to be inserted with different means and is most likely outdated.	Reporting functions of the tool are not used as they were found to be limited and did not fulfill the needs. Crystal Reports is used instead and it works perfectly well with the tool.	Implementation project started in the beginning of 2005 and finished in May 2006.	Has been found to be very useful and important however mostly in the data gathering and incident resolution wise. Crystal Reports is used in analyzing the data and that is where the full benefits of the gathered data are realized.

Table 14. Summary of tools and customers: IBM, Requeste and Oulun Tietotekniikka and Service-now.com and Cargotec.

Customer	Reason to acquire tool	How widely the tool is used	CMDB	Reporting	Implementation length	Decision making
IBM	–	–	–	–	–	–
Requeste / Oulun Tietotekniikka	To replace the old ticketing system. Support functions and request fulfilments were expanded to cover the entire organization and to improve electronic services provided for the customers.	Implemented processes at the moment are only incident management and configuration management with knowledge management in early phases.	Populating and updating the CMDB is also done with a 3rd party solution.	Reporting functions of the solutions are difficult to use so thus not used. Reporting is done with a 3rd party Business Intelligence solution.	It took 3 months to implement the solution with 10 people working on it.	Decision making process is supported by the tool in the form of provided data. The data the tool provides is exported to a Business Intelligence tool for analyzing.
Service-now.com / Cargotec	The tool was originally acquired as a Service Desk tool with possibilities to expand in the future. There was a need to harmonize technologies and operations globally.	Incident Management, Service Level Management, Reporting and Asset Management. Self Service portal is currently in pilot use. Problem and Change Management processes are implemented in the future.	CMDB is only partially in use with services listed. Cargotec is planning to put all master data in CMDB but they have challenges due to multi-supplier environment. Auto-discovery tool is the only option here.	The reporting functions are good in the tool; however, all reports are modified for Cargotec's use specifically. It needs understanding and experience to create and modify but it is relatively easy to learn in time.	The processes were defined in March 2010. The tool was introduced in April 2010. Workshops and testing regarding the tool in June and July. In August the tool was in production.	Enables better following of the suppliers, better information provided and understanding the suppliers. Also processes are now connected in the organization.