AALTO UNIVERSITY
School of Science
Degree Program in Computer Science and Engineering

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APPLYING THE INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY IN A MULTI-VENDOR ENVIRONMENT

Master's Thesis

Espoo, May 27, 2015

Supervisor: Professor Martti Mäntylä

Thesis advisors: Kari Hiekkanen, M.Sc. (Tech.), Mikko O. J. Laine, M.Sc. (Tech.)

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Aalto University School of Science Degree Program in Computer Science and Engineering	ABSTRACT OF MASTER'S THESIS

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Title: Applying the Information Technology Infrastructure Library in a Multi-Vendor Environment

Number of pages: 74 + 3	Date: 2015-05-27	Publishing language: English
Professorship: Information Technology		Code: T-86

Supervisor: Professor Martti Mäntylä

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IT service management (ITSM) is a core topic in the industry. The Information Technology Infrastructure Library (ITIL), as a related best practice framework, aims to assist in standardizing the industry processes. From a sourcing model point of view, multi-vendor setups gain popularity and are further optimized. Hence is it important to understand how ITIL should be applied in multi-vendor environments (MVEs). Currently there are a limited number of academic publications available on this topic and this study serves an important purpose.

The research problem of this study is: "How should ITIL be applied in an MVE?" The main research questions are:

- What are the key benefits of applying ITIL in an MVE?
- What are the critical success factors when applying ITIL problem management in an MVE?
- Do stakeholders recognize these key benefits and critical success factors?

The research confirms five viewpoints under which the findings can be categorized. A total of nineteen key benefits and nineteen key success factors were identified for the first two research questions. Further, these results were used to answer the third research question. ITIL consultants seem to have the widest understanding of ITIL best practices compared to clients and suppliers. On the practical process delivery level, suppliers seem to outperform the two other groups.

The results of the study are extensively discussed in the research report and specific recommendations are given to three stakeholders groups in a typical MVE. The research report also contains known limitations of the study and a list of intriguing opportunities for further research. As a whole the study met the objectives set for it.

The categorization model confirmed for the first two research questions can be reused in future studies.

Keywords: IT service management, ITSM, information technology infrastructure library, ITIL, problem management, multi-vendor environment, outsourcing

Aalto-yliopisto Perustieteiden korkeakoulu Tietotekniikan koulutusohjelma	DIPLOMITYÖN TIIVISTELMÄ

Tekijä: Karri Mikko Jalmari Karanko

Työn nimi: Information Technology Infrastructure Libraryn soveltaminen monitoimittajaympäristössä

Sivumäärä: 74 + 3	Päiväys: 27.05.2015	Julkaisukieli: englanti

Professuuri: Tietotekniikka	Professuurikoodi: T-86

Työn valvoja: Professori Martti Mäntylä

Työn ohjaajat: DI Kari Hiekkanen, DI Mikko O. J. Laine

IT-palveluiden hallinta (ITSM) on merkittävä tietotekniikan osa-alue. Information Technology Infrastructure Library (ITIL) on parhaiden käytäntöjen viitekehys, jolla pyritään standardoimaan ITSM-prosesseja. Hankintamallien näkökulmasta monitoimittajaympäristöt yleistyvät ja niiden toimintaa pyritään kehittämään. Tästä syystä on tärkeää ymmärtää, miten ITILiä tulisi soveltaa nimenomaan monitoimittajaympäristössä. Toistaiseksi ITILiä on tutkittu vähän tiedeyhteisön toimesta, ja siksi tämä tutkimus on erittäin tarpeellinen.

Tutkimusongelma, johon tutkimus vastaa, on: "Miten ITILiä tulisi soveltaa monitoimittajaympäristössä?" Tutkimuksen apukysymykset ovat:

- Mitkä ovat keskeiset hyödyt ITILin soveltamisesta monitoimittajaympäristössä?
- Mitkä ovat kriittiset menestystekijät, kun sovelletaan ITILin ongelmanhallintaa monitoimittajaympäristössä?
- Tunnistavatko palveluiden eri osapuolet nämä keskeiset hyödyt ja kriittiset menestystekijät?

Tutkimus vahvistaa hypoteesin viidestä näkökulmasta, joiden alle löydökset voidaan kategorisoida. Tutkimuksessa tunnistettiin yhteensä yhdeksäntoista keskeistä hyötyä ja yhdeksäntoista kriittistä menestystekijää. Kahden ensimmäisen apukysymyksen tuloksia käytettiin kolmanteen apukysymykseen vastaamiseen. ITIL-konsulteilla on laajin yleinen tietämys viitekehyksen parhaista käytännöistä verrattuna asiakkaisiin ja palveluiden toimittajiin. Käytännön prosessikysymyksissä palveluiden toimittajat loistivat muihin osapuoliin verrattuna.

Tutkimuksen tulokset käydään tutkimusraportissa yksityiskohtaisesti läpi. Lisäksi annetaan selkeitä suosituksia monitoimittajaympäristön palveluiden eri osapuolten käyttöön. Tutkimusraportti sisältää tiedot tutkimuksen rajoituksista, ja siinä listataan myös jatkotutkimukseen soveltuvia aiheita. Kokonaisuudessaan tutkimus saavutti sille asetetut tavoitteet.

Tutkimuksessa vahvistettu malli hyötyjen ja menestystekijöiden kategorisointiin soveltuu käytettäväksi myös tulevissa aihepiirin tutkimuksissa.

Asiasanat: IT-palveluiden hallinta, ITSM, information technology infrastructure library, ITIL, ongelmanhallinta, monitoimittajaympäristö, ulkoistaminen

FOREWORD

I have had a professional interest in IT service management for several years. During that time I have seen different sourcing models being utilized as well as the major transition from in-house operations to the outsourcing world. It has become evident to me that multi-vendor setups are always challenging to all the parties involved. Hence I wanted to do my share and provide science-based information on how ITIL should be applied in a multi-vendor environment. After all, ITIL is the de facto standard for IT service management.

I want to thank Kari Hiekkanen for taking the advisor's role in relation to the ITIL substance.

I want to thank Mikko O. J. Laine for taking the advisor's role in relation to the research methods.

I want to thank Martti Mäntylä for the responsive and encouraging supervision during the last months of this journey.

Thanks to Eeva, Erkka, Markus, and Mikko for the study groups and extracurricular activies in the early '00s.

Thanks to my family and all my friends for the support and for being there.

Espoo, May 2015

Karri Karanko

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GLOSSARY

Abbreviation	Meaning
CMS	Configuration Management System
COBIT	Control Objectives for Information and Related Technology
CSI	Continual Service Improvement
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
IT	Information Technology
ITIL	Information Technology Infrastructure Library
ITSM	IT Service Management
KEDB	Known Error Database
MOF	Microsoft Operations Framework
MVE	Multi-Vendor environment
OGC	Office of Government Commerce
SD	Service Desk
SI	Service Integrator
SLA	Service Level Agreement
SLM	Service Level Management
SP	Service Provider
SPOC	Single Point of Contact
TSO	The Stationary Office

Term	Meaning
IT Service Management	The implementation and management of quality information technology (IT) services that meet the needs of the business. IT service management (ITSM) is performed by IT service providers through an appropriate mix of people, process and IT.
Information Technology Infrastructure Library	A set of best practice guidance for ITSM. ITIL is owned by the Office of Government Commerce and consists of a series of publications giving guidance on the provision of quality IT services, and on the processes and facilities needed to support them.
Service Strategy	The title of one of the core ITIL publications. *Service Strategy* establishes an overall strategy for IT services and for ITSM.
Service Design	A stage in the life cycle of an IT service. Service design includes a number of processes and functions – *Service Design* is the title of one of the core ITIL publications.
Service Transition	A stage in the life cycle of an IT service. Service transition includes a number of processes and functions – *Service Transition* is the title of one of the core ITIL publications.
Service Operation	A stage in the life cycle of an IT service. Service operation includes a number of processes and functions – *Service Operation* is the title of one of the core ITIL publications.
Continual Service Improvement	A stage in the life cycle of an IT service – *Continual Service Improvement* is the title of one of the core ITIL publications. Continual service improvement is responsible for managing improvements to ITSM processes and IT services. The performance of the IT service provider is continually measured and improvements are made to processes, IT services and IT infrastructure in order to increase efficiency, effectiveness, and cost.
Incident Management	The process responsible for managing the life cycle of all incidents. The primary objective of incident management is to return the IT service to customers as quickly as possible.
Problem Management	The process responsible for managing the life cycle of all problems. The primary objectives of problem management are to prevent incidents from happening and to minimize the impact of incidents that cannot be prevented.
Multi-Vendor Environment	The IT services sourcing model in which the service recipient is acting as the service integrator while purchasing delivery services from multiple service providers.

For all glossary definitions the source is (OGC, 2005) *except for the definition for an MVE.*

1. INTRODUCTION

1.1 Background

Modern enterprises are powered by computer systems that execute vital business processes. The discipline for managing these systems is called information technology service management (ITSM). A process library called the Information Technology Infrastructure Library (ITIL) was created by the Office of Government Commerce (OGC) (in the UK) to collect ITSM best practices under one common framework.

Traditionally enterprises have had in-house information technology (IT) departments that have produced and provided the needed services. In the next step of evolution enterprises have chosen one trusted outsourced partner to take over the majority of the IT staff and the responsibility to provide the services. A recent development in the sourcing model area has been the introduction of the multi-vendor environment (MVE). An MVE means that the service recipient is acting as the service integrator (SI) while purchasing delivery services from multiple service providers (SPs). This model enables enterprises to flexibly reach the best talent and rates on the market.

This research concentrates on how to apply ITIL best practices in the MVE sourcing model.

1.2 Research problem and objectives

The research problem of this study can be stated as follows:

"How should ITIL be applied in an MVE?"

As the research problem is too wide to be covered as part of one study the following sub-topics have been identified as the main research questions:

1) What are the key benefits of applying ITIL in an MVE?

2) What are the critical success factors when applying ITIL problem management in an MVE?

3) Do stakeholders recognize these key benefits and critical success factors?

The focus of this study is in the application of ITIL and not ITIL itself.

1.3 Scope

The scope of this study has been limited to IT services where ITIL v3 is applied. Also, only one of the many ITIL reference processes has been selected as target of investigation. This process is part of the service operations stage in the life cycle of an IT service and is named problem management. Problem management is selected because it clearly demonstrates the challenge of the MVE, where multiple stakeholders interact.

There is also a more recent 2011 edition of ITIL available. The adoption of the new version is not yet mainstream and hence it is kept outside of this research.

When references are made to the Control Objectives for Information and Related Technology (COBIT) IT governance framework, COBIT version 4.1 is referred to throughout the study. There is also a more recent version of COBIT available (COBIT 5) but it is not yet widely adopted.

1.4 Research methods

The current academic literature for the topic was reviewed. The primary purpose was to understand what has been researched (and on what level) related to the ITIL framework by the academic community.

The search was executed by first choosing well-known article databases, for example, Web of Science by Thomson Reuters. Very soon it became evident that overall there is a limited amount of quality academic research available related to ITIL. For example, the Web of Science database contained only 11 journal articles that matched an ITIL title search. On the same database the number of conference articles was 58.

In general the article databases (Web of Science, Scopus, the Association of Computing Machinery, the AIS Electronic Library, the IEEE/IEE Electronic Library, and ABI/INFORM) contained different numbers of ITIL related references. As an

observation, the articles were generally very recent, published in conference proceedings, and not often cited. Hence the first 20 results, in order of relevancy, were explored in more detail. The most relevant articles were commonly indexed in more than one of the target article databases. Further details of the search for scientific information are available in Appendix I: Data sources and keywords.

The empirical data for research questions 1 and 2 were gathered through semi-structured theme interviews. Research question 3 was not directly part of the interviews. The results for question 3 are derived from the results of research questions 1 and 2.

1.5 A viewpoint hypothesis for the study

A categorization of five practical viewpoints was derived from conducting the literature review and from expert evaluations. The viewpoints were used to guide the interviews. The primary purpose of this is to support wider thinking of the different benefits and success factors in the ITIL landscape. The interviewees had also the possibility to suggest additional viewpoints, but those given were considered adequate. In academic terms the set of viewpoints is a hypothesis for the study as they are not based on an exact source but a combination of multiple sources and experts evaluation. The hypothesis is described in Table 10. Further, this hypothesis is confirmed in Chapter 7.

Table 1. Viewpoint hypothesis descriptions

Viewpoint	Description
Contractual	The contractual viewpoint includes topics that should be emphasized when writing service contracts between the service recipient and the suppliers. For example, the use of ITIL based terminology and specific topics to be included in the contracts were noted in the interviews.
Financial	The financial viewpoint is about how ITIL best practices can help from a cost effectiveness point of view and how business priorities can be visible in the decisions.
Functional	The functional viewpoint is about practical topics occurring when applying ITIL best practices. For example, looking at what benefits the existing wide adoption of ITIL gives and what should be noted in addition to the processes.

Process	The process viewpoint is about core process questions related to ITIL best practices.
Quality	The quality viewpoint contains measurement topics, e.g., key performance indicators, knowledge retention, and continuous improvement considerations.

1.6 The structure of the study

The first chapter introduces the research problem and describes how the rest of the paper is organized. The second chapter briefly introduces ITSM and related frameworks, including ITIL. The third chapter is a dive to the third generation of ITIL best practices. The fourth chapter introduces and discusses the ITIL problem management domain in detail. The fifth chapter sets the scene of an MVE, contrasting it with more traditional sourcing models. It also discusses different IT sourcing models. The purpose is to give the reader a picture of where an MVE falls in the sourcing field. The sixth chapter introduces and justifies the chosen research methodology. The seventh chapter contains the results received through analysis of the data. The eighth chapter discusses the results and sets them in the right context. In addition, limitations of the study and possible future research opportunities are explored. The ninth chapter wraps up the study and states the conclusion in respect to the original research questions stated in this chapter.

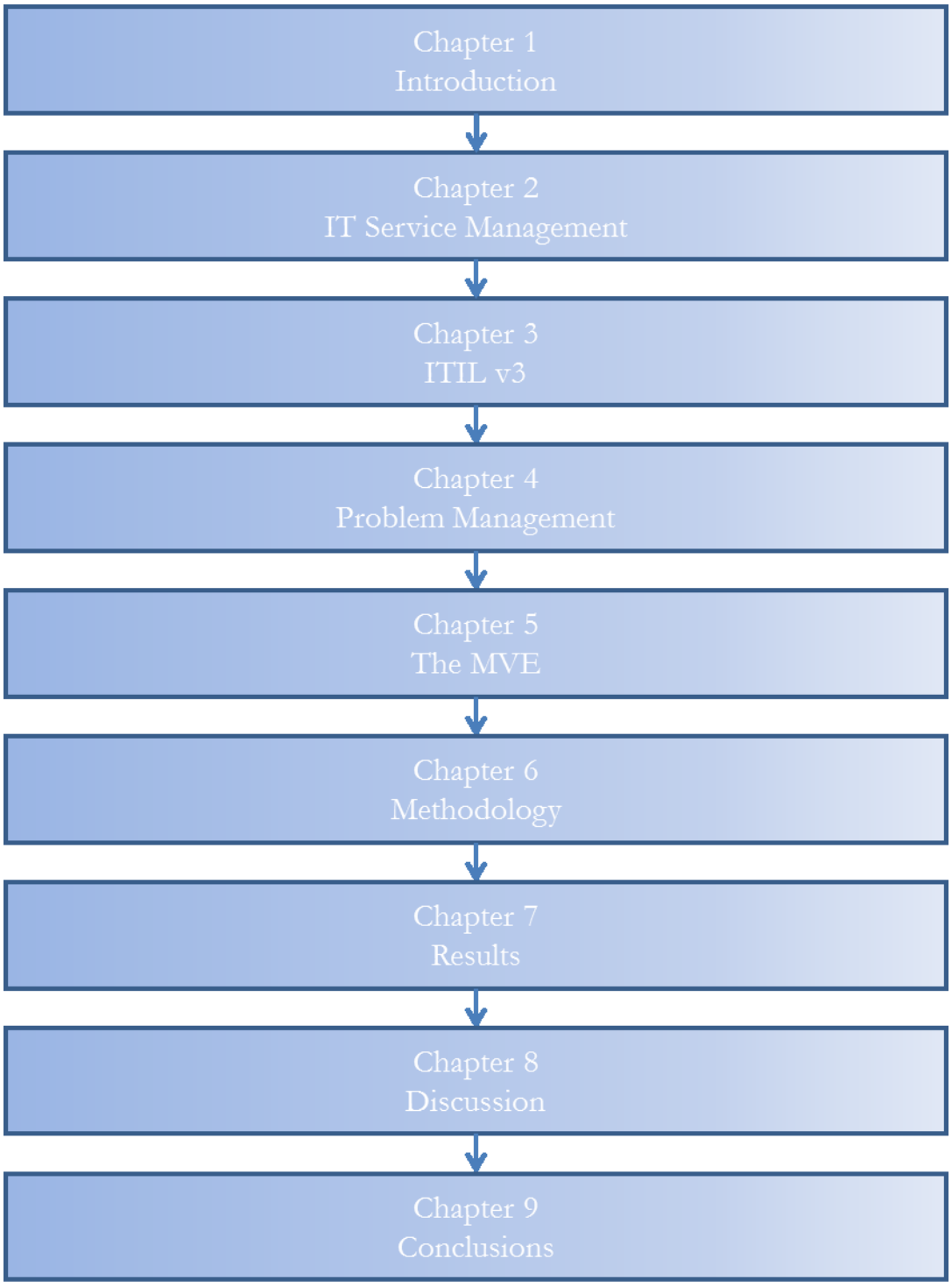

Figure 1. The structure of the study

2. ITSM

2.1 In general

ITSM is a process-focused discipline for the implementation and management of quality IT services that align with current business needs (OGC, 2007f). In a corporate environment ITSM is related to IT governance and further to corporate governance, as illustrated in the below figure and as discussed in the next section.

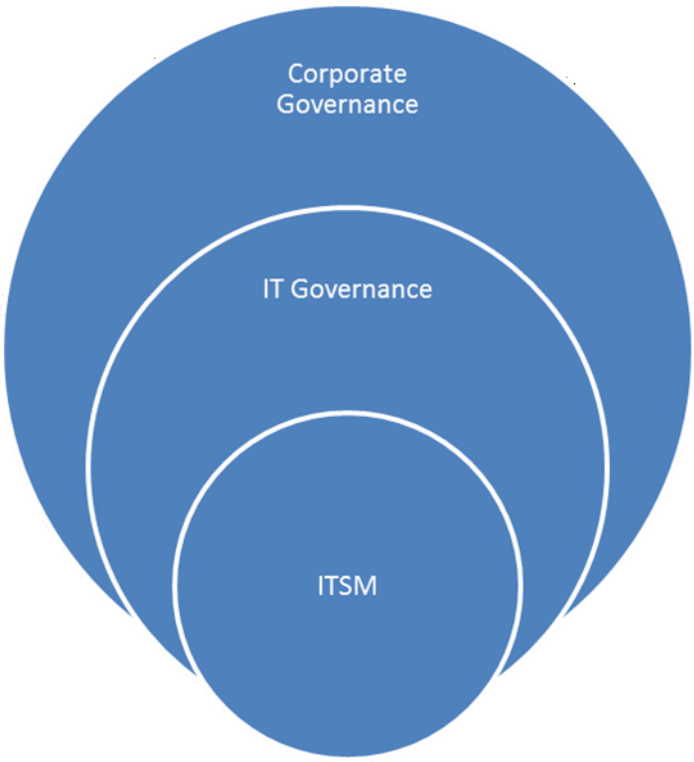

Figure 2. The relation of the governance models and ITSM

2.2 Background

Corporate governance is "the system by which companies are directed and controlled" (Cadbury, 1992, p. 14). Cadbury's committee had the task of reviewing and giving recommendations on how to improve financial reporting and accountability in the corporate environment. The committee had been appointed by the UK Financial Reporting Council and others after a series of governance failures led to the bankruptcy of companies and the associated financial institutions. Notably, this was 10 years before the Enron accounting scandal.

IT governance is a subset of corporate governance. IT governance "consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives" (IT Governance Institute, 2012, p. 1). Also Weill and Ross have given their own definition: "Specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT" (Weill & Ross, 2004, p. 1). The first definition is used and promoted by the IT Governance Institute and is the definition used in this study.

In order to deploy IT governance one should look for a suitable framework. COBIT is a widely known IT governance framework. The framework "supports governance of IT by defining and aligning business goals with IT goals and IT processes" (Palade, 2012, p. 1).

ITSM is one of the enablers for IT governance objectives. While COBIT concentrates on *what* should be achieved, ITSM focuses on *how* to achieve it. To be more precise, ITSM "focuses upon providing a framework to structure IT-related activities and the interactions of IT technical personnel with business customers and users" (UCSF, 2015, p. 1). Different interest groups have slightly different definitions of ITSM. It should also be noted that the definitions also evolve over time. OGC's early definitions of ITSM were not business-value oriented.

IT service providers perform ITSM through an appropriate mix of people, process, and IT (OGC, 2007f). It is increasingly important that the vendors focus on the quality of services and customer relationships. The providers can no longer have a technology focused delivery approach.

A number of frameworks have been developed over time to support ITSM in practice. The frameworks have different focus areas and the majority of them have evolved over time. While ITSM is about services it does not cover all the aspects of the IT life cycle. For example, software and hardware development is out of its scope. A common characteristic of these other process groups is continuous improvement, which is covered in more detail in Section 3.6.

2.3 The relation to service science

Spohrer and Riecken wrote the below paragraph in the introduction of their paper about service science.

> To the majority of computer scientists, whether in academia or industry, the term "services" is associated with Web services and service-oriented architectures. However, there is a broader story to be told of the remarkable growth of the service sector, which has come to dominate economic activity in most advanced economies over the last 50 years … The opportunity to innovate in services, to realize business and societal value from knowledge about service, to research, develop, and deliver new information services and business services, has never been greater. (Spohrer & Riecken, 2006, p. 5).

Service science is a new way for viewing, developing, and deploying information and communications technology (ICT). ITSM is a subset of service science that focuses on IT services. "Providers of IT services can no longer afford to focus on technology and their internal organization; they now have to consider the quality of the services they provide and focus on the relationship with customers." (OGC, 2005, p. 3).

2.4 ITSM related frameworks

There are multiple ITSM related frameworks published. The following table lists the most common of them and indicates the related focus area of each and a short overall description.

Table 2. ITSM related frameworks (adapted from OGC, 2007f)

Model	Focus	Description
ITIL	ITSM	ITIL is a set of ITSM best practices defined by the OGC (in the UK). In its own glossary ITIL is defined as "A set of best practice guidance for IT service management" (OGC, 2007f, p. 200). ITIL publications contain example process definitions that can be applied to real life services. With ITIL it is key to understand that a set of best practices is not something that can be directly applied to all situations as it is. One can localize the provided base processes and still remain ITIL compliant. ITIL is the focus area of this study and hence the evolution of the best practice set and case process is introduced later.

COBIT	IT Governance	COBIT is published by the IT Governance Institute (in the US). COBIT's glossary defines it as "a complete, internationally accepted process framework for IT that supports business and IT executives and management in their definition and achievement of business goals and related IT" (IT Governance Institute, 2011, p. 1). COBIT's roots are in information system auditing, from where it has matured into an overall IT management framework (OGC, 2007f). Based on the definitions, it can be said that COBIT is more about IT governance than ITIL. COBIT is strong on controls and metrics while ITIL applies best practice processes.
ISO/IEC 20000	ITSM	ISO20000 is the first international standard of ITSM. "It promotes the adoption of an integrated process approach to effectively deliver managed services to meet business and customer requirements" (OGC, 2007f, p. 145). ISO20000 builds on the ITIL service management processes (OGC, 2007f). It also supports other ITSM frameworks like the Microsoft operations framework (MOF) and COBIT. "Many organizations use ITIL as a means to achieve compliance with a formal, audited standard such as ISO20000" (OGC, 2007f, p. 14).
ISO/IEC 15504 SPICE	Process Assessment	ISO15504 is also known as Software Process Improvement and Capability dEtermination. It provides a framework for the assessment of process capability (OGC, 2007f). ISO15504 can also be used by organizations to assess process performance and in the development of process models.
ISO/IEC 19770:2006	Asset Management	ISO19770 is an international standard on Software Asset Management. The standard should effectively support ITSM. Hence it is intended to align closely with, and support ISO20000 (OGC, 2007f).
MOF	ITSM	MOF is an ITSM framework owned by the Microsoft Corporation. "MOF delivers practical guidance for everyday IT practices and activities, helping users establish and implement reliable, cost-effective IT services" (Microsoft, 2011, p. 1). MOF is originally based on ITIL service management processes, simplifying the approach. The MOF framework is more supportive, i.e. user friendly, while ITIL is more precise.

M_o_R	Risk Management	Management of Risk is a general frame for risk management in an organization. "Management of Risk provides a framework that is tried, tested, and effective to help you eliminate or manage risks involved in reaching your goals" (OGC, 2007f, p. 146). The framework is owned by the Cabinet Office of the UK. It is important to note that the framework is not bound to IT but is applicable across the organization. The framework recognizes both negative and positive risks, that is to say, threats and opportunities.
PMBOK	Project Management	Project Management Body of Knowledge is a methodology owned and controlled by the Project Management Institute. The content of the methodology is constantly evolving as it is updated by the practitioners and academics. Hence the Project Management Body of Knowledge is the sum of knowledge within the profession of project management (OGC, 2007f).
PRINCE2	Project Management	The PRoject IN Controlled Environments is a structured project management method owned by the OGC (OGC, 2007f). The method is designed for public sector requirements, though it is used by many others (such as financial institutions) worldwide. The method is stated to be too heavy for small projects but it is known to scale well for larger programs.
Capability Maturity Model Integrated	Process Maturity	Capability Maturity Model Integrated has been created by the Software Engineering Institute in the US. "In the beginning CMM [capability maturity Model] was a model for demonstrating the maturity of software development processes in the belief that more mature development processes led to better software" (OGC, 2007f, p. 146). Nowadays the situation is more general and Capability Maturity Model Integrated is used to measure the maturity of any process.
Six Sigma	Quality Management	Six Sigma is a strategy for process improvement and variance reduction (OGC, 2007f). The foundation for Six Sigma is that the target process can be measured from a statistical point of view. The process statistics are analyzed and variations in the statistics lead to improvement actions. The target is to remove clear defects from the process and minimize overall variation in manufacturing or business processes.

2.5 ITIL's evolution

The evolution of ITIL started in the 1980s. "The earliest version of ITIL was actually originally called GITIM, Government Information Technology Infrastructure Management" (ITIL Central, 2005, p. 1). The different ITIL releases have not only been updates to existing documentation. Table 3 summarizes the characteristics of previous and current ITIL versions.

Table 3. Evolution of ITIL

Version	Published	Summary
ITIL v1	Late '80s	The initial version of ITIL consisted of 40 books, published over a long timespan. The last ITIL v1 book was published in 2001. The focus was on stability and control of the infrastructure. At this time IT was mostly seen to be a technology provider.
ITIL v2	2002	The second version consisted of a total of 8 books, out of which *Service Support* and *Service Delivery* were considered the most important. The quality and efficiency of IT processes were the primary foci of the v2 update. Also the role of IT evolved towards being a service partner.
ITIL v3 (2007 ed.)	2007	The third version was reformed to include five books: *Service Strategy, Service Design, Service Transition, Service Operation,* and *Continuous Service Improvement*. The focal area was the alignment and integration of corporate business and IT functions. The role of IT evolved further, to become that of strategic partner.
ITIL v3 (2011 ed.)	2011	The 2011 edition is more of a rewrite of the 2007 edition's books. *Service Strategy* has been almost completely rewritten while the other books have been updated.

3. ITIL v3

3.1 In general

ITIL is a best practices framework with a focus on ITSM. As described in Section 2.5, the content has been repeatedly rethought and rewritten to meet current understandings of the available best practices. ITIL v3 contains the processes from v2 while the interfaces have been adapted for the v3 model. "ITIL v3 complements the processes known from ITIL v2 with a number of new processes and puts more emphasis on producing value for the business" (IT Process Wiki, 2011, p. 1).

The most notable distinction of v3 is the new ITIL service life cycle model. OGC actually defines it as the *core of practice*. "ITIL v3 is best understood as seeking to implement feedback-loops by arranging processes in a circular way" (IT Process Wiki, 2011, p. 1).

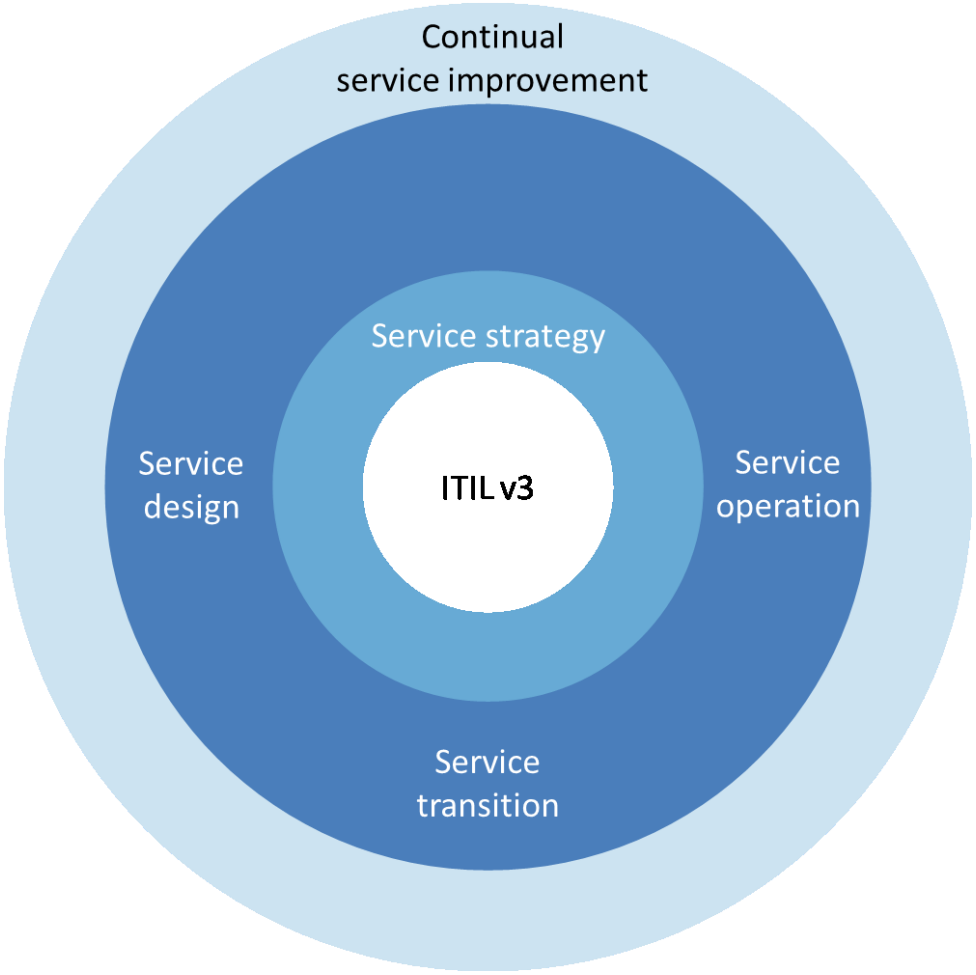

Figure 3. The ITIL service life cycle, including the five disciplines (adapted from OGC, 2007f)

OGC started the v3 rewrite of ITIL in 2004. This was motivated by the changing IT landscape. "New technology architectures, virtualization, and outsourcing became a mainstay of IT and the process-based approach of ITIL needed to be revamped to address service management challenges" (OGC, 2007f, p. 3). ITIL v3 has five main disciplines (service strategy, service design, service transition, service operation, and continual service improvement) that are introduced and discussed in the next sections.

3.2 Service strategy discipline

The key concepts in service strategy are: value creation, service assets, service provider types, service capabilities and resources, service structures, defining the service market, developing service offerings, financial management, service portfolios, demand management, service assessment, and return on investment (OGC, 2007f). For this study the most interesting concepts are SP types and service outsourcing. These internal and external SP models are discussed in the next paragraphs.

ITIL recognizes internal and external SP organizations and divides both of these into further subcategories (OGC, 2007d, p. 41). The first internal organization type is "internal," which is often business-unit specific and does not include cost transfer across the organization. The second type is called "shared services," in which typically an IT department provides services across the organization and cost recovery takes place.

For external service organizations ITIL defines four types: full services outsourcing, prime, consortium, and selective outsourcing. Out of these, selective outsourcing is closest to the term MVE used in this study. The term MVE will be further defined and discussed in Chapter 5. The motivation to use an external service organization is usually "access to knowledge, experience, scale, scope, capabilities, and resources that are either beyond the reach of the organization or outside the scope of a carefully considered investment portfolio" (OGC, 2007f, p. 28).

The *Service Strategy* book in the 2007 edition has been criticized for being difficult to read and master. For example, England describes it as "hundreds of pages of densely packed theory" (England, 2009, p. 1). In ITIL v3's 2011 edition the *Service Strategy* book was rewritten.

3.3 The service design discipline

According to OGC the "main purpose of the service design stage of the life cycle is the design of new or changed service for introduction into the live environment" (OGC, 2007f, p. 45). The key concepts of service design are centered around five design aspects and the design of services, service processes, and service capabilities to meet business demand (OGC, 2007f).

Table 4. The five aspects of service design (OGC, 2007f)

#	Aspect to be considered
1	The design of the services, including all of the functional requirements, resources, and capabilities needed and agreed upon.
2	The design of service management systems and tools (especially the service portfolio) for the management and control of services through their life cycle.
3	The design of the technology architectures and management systems required to provide the services.
4	The design of the processes needed to design, transition, operate, and improve the services, the architectures, and the processes themselves.
5	The design of the measurement methods and metrics of the services the architectures, their constituent components, and the processes.

For this study the most interesting parts are the design and planning of service level management (SLM) and supplier management. SLM is about negotiating and making service level agreements (SLA) with the business. SLAs should not be confused with operational level agreements. An SLA is an agreement between the business and the SP while an operational level agreement is an agreement between the SP and actual support teams.

SLM is very important as "if the SL [service level] targets are not aligned with business need, then service provider activities and service levels will not be aligned with the business expectations and problems will develop" (OGC, 2007f, p. 52).

When running business-critical information systems in live environments it is essential that the services are designed to meet the expected service levels. One can think of the

difference between the B2B and B2C e-commerce systems. Commonly B2B transactions have high value but low volume while B2C purchases have lower value but high volume. In B2C sales every second counts and there is less possibility to ask for the customer to wait or place a new order.

The supplier management process is important as it "ensures that suppliers and the services they provide are managed to support IT service targets and business expectations" (OGC, 2007f, p. 70). An MVE makes this very critical as the IT department has the responsibility to keep all the suppliers aligned and informed. It might happen that the supplier is performing well according to the targets but that business expectations are still not met. This kind of situation could be observed through, for example, client satisfaction surveys. In a healthy relationship this kind of result would trigger an improvement cycle as the service level requirements and the service level agreement are not fit for purpose. "A strong and trusted relationship with suppliers are an integral element of successful service management and enhance the value of any service provider to the business" (OGC, 2007f, p. 72).

3.4 Service transition discipline

The key concepts of service transition are: transition planning, asset and configuration management, release and deployment management, change management, and testing and validation (OGC, 2007f). From an MVE point of view, transition planning and change management are the most interesting.

Transition planning is about taking a new or changed service into a live environment. The goal is to ensure that "the requirements of service strategy encoded in service design are effectively realized in service operations" (OGC, 2007f, p. 76). When, for example, in-house work products are going to be supported by an external supplier, adequate knowledge transfer must take place. Without proper knowledge management information can be lost or simply not be available to the organization supporting the live environment.

Change management concerns all the parties within the same domain. Common awareness of upcoming changes and understanding how to pursue one's planned changes is a must in an MVE. OGC defines the "seven R's" of change management as follows:

- Who RAISED the change?
- What is the REASON for the change?
- What is the RETURN required from the change?
- What are the RISKS involved in the change?
- What resources are REQUIRED to deliver the change?
- Who is RESPONSIBLE for the build, test, and implementation of the change?
- What is the RELATIONSHIP between this change and other changes?

The above are the key questions that need to be answered for all changes in order to make due assessment on impact, risk, and benefits (OGC, 2007e, p. 53).

Change management recognizes three different change models. One is for general pre-approved change related to operational maintenance. The second is for non-general changes that are assessed on a case-by-case basis. The third model is for emergency situations. Emergency changes are those that need to be implemented in the live environment without time to execute the regular change process. In practice the paperwork is done afterwards in the case of an emergency. This is fairly critical in MVEs where some parties might be left uninformed about the change.

3.5 Service operation discipline

Service operation is the actual business-as-usual phase of the ITIL service life cycle. "From the customer's point of view this is where the actual value is seen" (OGC, 2007f, p. 94). Work done on business values and cost planning during the preceding phases is finally realized. The further optimization of these is covered in Section 3.6.

From an MVE perspective the two most interesting aspects of service operation are incident management and problem management. The latter process is discussed in more detail in Section 4.2. In an MVE an interesting point is the resolution of incidents or

problems in a situation where multiple resolver groups need to contribute towards a common goal.

The service desk (SD) is a functional unit that is the single point of contact (SPOC) for IT users. An SD manages events, usually incidents and service requests, and when needed escalates the created tickets to other resolver groups. Complex MVEs benefit from the existence of an SD as end users do not need to know how to contact individual support teams (be they internal or external). On the other hand the SD must be well educated about all the services in order to fulfill its duties.

3.6 Continual service improvement discipline

Continual service improvement (CSI) is defined on three levels, the first being that of overall ITSM discipline, the second being the alignment of the service portfolio with the business need, and the third being about the maturity of the IT processes in day-to-day operations. It is also referred as the "core of practice" by OGC. The CSI process contains seven steps:

1. Define what you should measure
2. Define what you can measure
3. Gather the data
4. Process the data
5. Analyze the data
6. Present and use the information
7. Implement corrective action

The target of the measurement and analysis is often numerical data related to SLM. This is beneficial "as SLM is responsible for not only defining business requirements but also IT's capabilities to achieve them" (OGC, 2007f, p. 137).

ITIL CSI is analogous to the Deming Quality Cycle, widely recognized in organizational management (Roman, 2012). "The four key stages of the cycle are Plan, Do, Check and Act, after which a phase of consolidation prevents the circle from rolling back down the hill" (OGC, 2007a, p. 51). This four-step method is used for corporate control and continues improvement of processes. With ITSM general quality improvement is made towards business and IT alignment, as illustrated in Figure 4.

In practice, one cycle of Deming's steps should provide maturity over time. After the cycle the realized improvements should be in use and the changes will also be checked during the next cycles. Hence it can be claimed that a line can be drawn under the circle to mark permanent results.

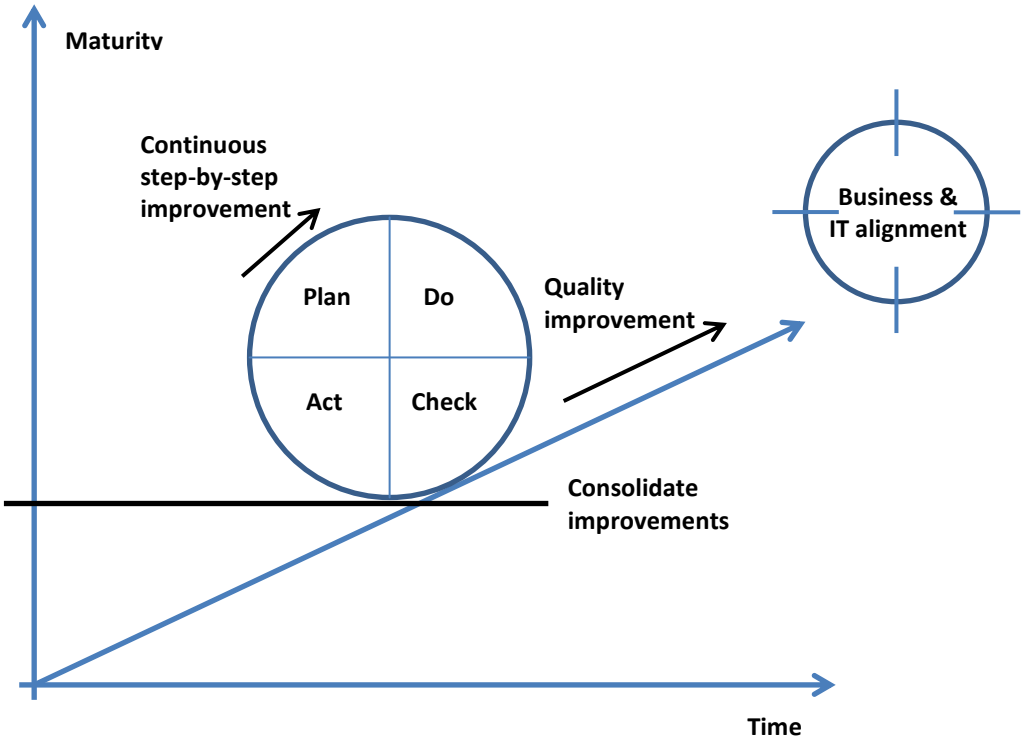

Figure 4. The Deming Quality Cycle (adapted from OGCa, 2007)

3.7 The known key benefits

The benefits of ITIL have been studied in limited manner by the academic community. Most of the available material is published by private commercial organizations. However, there are certain academic articles from conferences and journals that touch on this question. In most cases the primary interest of the article is in ITIL implementation and adoption topics and the benefits are listed mostly as a justification for the investment.

In Table 5 nine different benefits of ITIL implementation are listed with references to five academic studies. The studies do not prove all the benefits but mostly add to each other. A clear common denominator is the expected improvement in service quality when applying the ITIL framework.

Table 5. The key benefits of ITIL implementation in previous literature (Marrone & Kolbe, 2011)

Area of improvement	(Hochstein, Tamm, & Brenner, 2005)	(Potgieter, Botha, & Lew, 2005)	(Marrone, Kießling, & Kolbe, 2010)	(Cater-Steel, Tan, & Toleman, 2008)	(Cervone, 2008)
Service quality	✓	✓	✓	✓	✓
Standardization of service	✓		✓	✓	
Customer satisfaction		✓	✓	✓	
Return on investment			✓	✓	✓
Reduction of downtime				✓	✓
Benefits from the best practice experience of others	✓				
Financial contribution control				✓	
First-call resolution rate				✓	
Morale of the IT staff				✓	

Alojail and Corbitt (2014) have studied how ITIL can benefit and improve generic outsourcing relationships. "The focus group informants were clearly getting benefits from ITIL and informants were suggesting the more ITIL was embedded into the culture of the firm, the greater the outcomes" (Alojail & Corbitt, 2014). The primary findings of the study have been categorized into five themes: knowledge sharing, communication quality, cost saving, technical service quality, and customer satisfaction and commitment.

3.8 Summary

ITIL v3 in its 2007 edition is currently the most widely adopted best practices framework for ITSM. It is used in business environments and by non-profit organizations. Additionally the framework has five disciplines that are not only about traditional IT but have a focus and binding towards minding business value aspects. CSI is the core of the v3 framework, which makes it easier for business and IT stakeholders to discuss the way forward, even in challenging situations.

4. ITIL PROBLEM MANAGEMENT

4.1 In general

ITIL problem management is linked to the second research question of this study. The goal is to understand the critical success factors in applying problem management in an MVE. Hence the problem management process is introduced and discussed in this chapter.

4.2 The problem management process

The starting point is that ITIL defines a problem as "the unknown cause of one or more incidents" (OGC, 2007f, p. 101). The need to implement other ITSM processes spans easily through a working incident management process (OGC, 2007f). Incidents can be raised by all the stakeholders including users, technical staff, and automated reporting systems. From a process point of view, the SD and event management interface with incident management tooling. All fresh incidents should be logged into the appropriate tool, regardless of the true source of the event. Incidents should also be categorized to a reasonable extent. The categorization can be used for example in determining inputs for the problem management process.

Problems can be identified through both a proactive and a reactive process. In the proactive process possible problem sources are analyzed prior to impacts on service quality. On the other hand, the reactive process handless problems that already affect the quality of services where there is an urgent need to understand the business impact of the problem.

According to ITIL best practice processes, proactive problem management is actually an input process in the problem management process that suggests how to handle generic problems in a reactive manner.

The following figure, Figure 5, illustrates the ITIL problem management process flow with certain interfaces highlighted. The different process steps are discussed in Subsection 4.2.3.

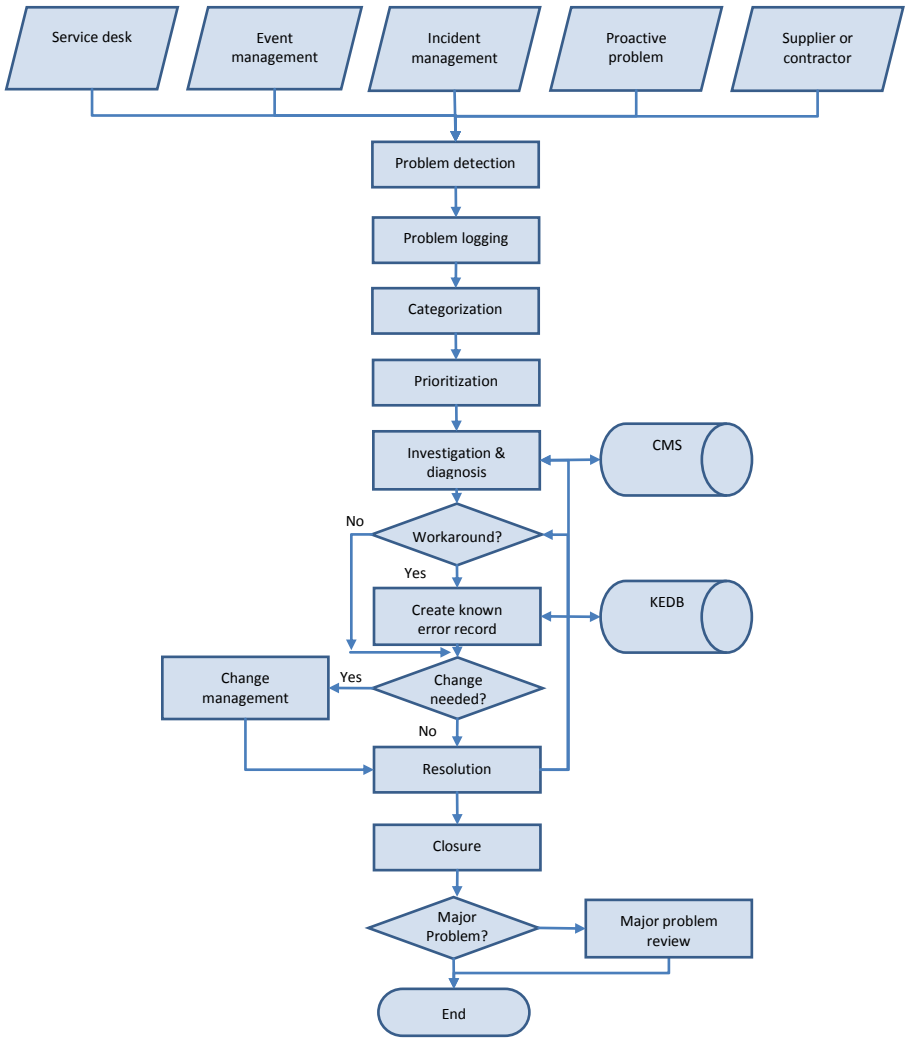

Figure 5. The problem management process flow (OGC, 2007f, p. 102)

4.2.1 Inputs to the process

Common inputs to the problem management process are: the SD, event management, incident management, proactive problem management, and supplier or contractor originated requests. Each of these has different detection characteristics that are discussed in their respective process step below.

4.2.2 Definitions

The beginning of Section 4.2 quoted that a problem is the cause of one or more incidents. The following terms are closely related to the problem management process.

Problem record: The master location for storing all information and history related to a particular problem. The record is stored within the ITSM tool to enable linking with incident tickets.

Workaround: Usually a short-term or medium-term solution to a problem in a situation where the actual root cause is not yet known or is too expensive to implement.

Known error: A problem that has been diagnosed and might already have a workaround documented.

Known error database (KEDB): Is a central repository for storing the known error records. In Figure 5 it can be seen that a KEDB is referenced in multiple steps, and hence good access and searchability are important.

Configuration management system (CMS): This system enables the effective understanding of the impact of the problem on the configuration items (CIs).

4.2.3 Process steps

Problem detection: SDs typically handle large volumes of incidents. As part of this work the SD might detect or suspect a problem based on one or more incidents. While investigating an incident the subject matter experts might realize that in fact they are dealing with a problem. Also incidents raised by automated monitoring tools can lead to a situation that a problem record needs to be raised (OGC, 2007c). In MVEs an external party might flag the need for a problem record. Proactive problem management is by definition an activity that tries to detect problems from a backlog of incidents in order to eliminate root causes and have less new incidents in the long run.

Problem logging: Despite the input source and detection mechanism, the problem record should be raised with care. Tool-wise it is important to link the respective incident records to the problem record and it should contain, for example, details of all diagnostic or attempted recovery actions taken (OGC, 2007c).

Problem categorization: In practice this process step is related to how the problem records should be tagged in the ITSM tooling. It is advised that the same coding system be used as

with the incident record (OGC, 2007c). Punctual categorization also enables quality reporting and hence contributes to better management decisions.

Problem prioritization: As with *problem categorization,* the priority tagging should be similar to that of incident records. Also the frequency and impact of related incidents must be taken into account (OGC, 2007c). The correct prioritization of problems enables a value adding resolution sequence and also contributes to better reporting.

Problem investigation and diagnosis: In this process step the problem is investigated and diagnosed with an appropriate level of effort. The level of effort should be decided based upon the categorization and prioritization. The ITIL v3 *Operation* book also refers to different systematic problem-solving techniques that can be evaluated and utilized. As Figure 7 suggests, CMS can be used to understand the impact of the problem, for example, through the number of configuration items involved. "The KEDB should also be accessed and problem-matching techniques (such as keyword searches) should be used to see if the problem has occurred before and, if so, to find the resolution" (OGC, 2007c, p. 115).

Workarounds: The problem management process also recognizes the existence of workarounds as temporary solutions to problems. In some cases the workaround might be more permanent or even a recurring solution when totally removing the root cause would be too expensive. "In cases where a workaround is found, it is therefore important that the problem record remains open, and details of the workaround are always documented within the problem record" (OGC, 2007c, p. 119).

Create a known error record: Known error records are raised in the KEDB. The primary purpose of the database is to provide reusable knowledge of encountered problems and their solutions. If there is a risk that the parallel diagnosis of a similar problem could be initiated, then raising a known error record can be justified, even if the root cause is not yet found (OGC, 2007c).

Problem resolution: The resolution of problems is in most cases linked to the change management process and a request for change must be raised. This process step is also linked to the KEDB as the solution needs to be updated to the respective record. "If the problem is very serious and an urgent fix is needed for business reasons, then an

Emergency RFC [request for change] should be handled by the Emergency Change Advisory Board (ECAB)" (OGC, 2007c, p. 119).

Problem closure: This process step relates to the closure of the problem record, which at this point of time should contain adequate information of the problem life cycle. "The status of any related known error record should be updated to show that the resolution has been applied" (OGC, 2007c, p. 120).

Major problem review: Major problems by definition cause severe damage or risk to ongoing business activities. Hence a review should be conducted after every occurrence of such a situation. The primary purpose of the review step is to allow the organization and all individuals involved to learn about the faced problem and enable swifter business operations in the long run. It is the responsibility of the problem manager to facilitate the reviews and document any agreed actions (OGC, 2007c).

4.2.4 Other important factors

Key performance indicators (KPIs) are by definition measures that should be carefully considered and agreed on, based on the business situation at hand. There are long lists of KPI suggestions for ITIL problem management but hastily chosen KPIs can also take the service in the wrong direction. The common saying, "You get what you measure," applies to ITSM process KPIs as well.

Rance (2014) suggests that KPIs should first be considered through success factors. If the success factor were "Identify problems that have caused multiple incidents" the possible KPIs could be an "Increased percentage of incidents associated with a problem record or known error" and the "Top 5 problem reports created every month".

Checklists are a common best practice that help to achieve process compliance or localize process related records to a common format.

Roles: A problem manager is an ITIL role specific to the problem management process. It is a life cycle role focusing on the management of a problem in all its stages. From a practical point of view the problem manager is responsible for swift resolution of the problem,

which in turn means preventing further incidents from occurring. To accomplish this goal the problem manager assigns the needed technical staff to work on a specific problem.

In some organizations there are also problem management process owners who promote problem management on an enterprise level and support operational problem managers where needed.

4.3 Known critical success factors

Previous literature suggests that a handful of studies exist on the critical success factors (CSFs) of generic ITIL implementation in public and private sectors. The literature review did not indicate specific research on the CSFs of ITIL problem management implementations. Most of the empirical data in the studies contained an IT outsourcing situation and hence a match to the MVE context of this study. It should be noted that outsourcing is not always done in the multi-vendor manner, as pointed out in Chapter 5.

In Table 6 a setup of four previous studies is presented in a combined manner. The first two are conference-based articles and the latter two are journal level articles. It can be noted that the studies do not seem to provide a generic model. The results of the first three studies overlap only on fairly generic topics, for example on management support and the training of personnel. The fourth study presents a wider list of CSFs and confirms most of the findings from the first three studies. However, it also adds seven new CSFs that are not provided by the other studies.

Due to the timing of the first two studies, the empirical data is influenced by ITIL v2, while the latter two studies can have the impact of ITIL v3. ITIL v2 focuses on service support and service delivery and hence these results are valid to a decent extent for ITIL v3 problem management considerations.

Table 6. CSFs for ITIL implementations in previous literature (adopted from Pedersen et al., 2010)

CSF	(Hochstein et al., 2005)	(Tan, Cater-Steel, Toleman, & Seaniger, 2007)	(Pollard & Cater-Steel, 2009)	(Pedersen, Kræmmergaard, Lynge, & Schou, 2010)
Quick wins	✓			✓
Continuous improvement	✓			✓
Marketing campaigns	✓			
Management support	✓	✓	✓	✓
Training and personnel development	✓	✓	✓	✓
A virtual project team	✓		✓	✓
Vendor expertise		✓		
Customer representatives on high-level committees		✓		
Implemented benefit realization plan		✓		
Champion for change		✓		✓
Planning and reinforcing the project objectives		✓		✓
Careful software selection			✓	✓
Use of consultants			✓	✓
Interdepartmental communication and collaboration			✓	✓
Process priority			✓	✓
ITIL-friendly culture			✓	
Customer-focused metrics			✓	
Strategic alignment and customer focus				✓
A contingency based approach				✓
Planned and risk-driven approach				✓
Incremental implementation process				✓
High quality ITIL implementation				✓
Education and knowledge management				✓
Change management				✓

4.4 Summary

Problem management is a domain of ITIL that is well-known but not always fully utilized. In order to understand problem management one needs to be familiar with incident management as well. The purpose of problem management is to reduce the number and the impact of incidents in the business of an enterprise.

The resolution of problems is led by the problem manager and this person is responsible for keeping the related tickets and repositories updated based on the latest information. The role of the problem manager is important in an MVE. The target system might be dependent on components supported by multiple vendors. Hence in a problem scenario the problem manager needs to be able to organize the work independently, regardless of which SPs are involved. The problem manager does not need to be a client stakeholder but needs to have agreed authority to utilize resources to get the problem resolved.

5. THE MVE

5.1 In general

The main purpose of this chapter is to define what is meant by an MVE in this study. An MVE is one of the sourcing models in the modern IT world. The following sections outline common IT sourcing models to set the scene for understanding the MVE setup. In Figure 6 we can see outsourcing steps that would apply to longstanding enterprises having a large in-house IT department to start with. For a newly founded enterprise the sourcing strategy could be started from scratch and the most fit-for-purpose sourcing directly used.

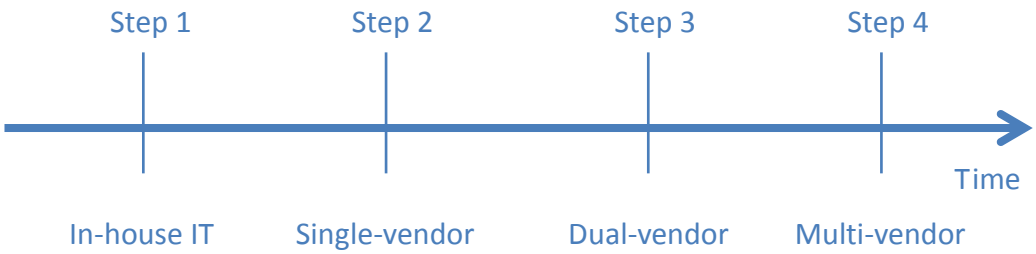

Figure 6. Possible outsourcing steps for a large traditional enterprise.

5.2 In-house

Traditionally, enterprises have built in-house IT departments to support their vital business processes and regulatory compliance. In-house IT departments have built up industry knowledge over time and understand the business in which the enterprise is in.

These in-house departments have typically grown in size in multiple dimensions. The dimensions can be, for example, the number of people employed or the number of separate applications developed and managed (and hence the number of intersystem integrations required to run the enterprise).

Still, from the business point of view IT departments have focused on IT delivery and reactions to changing business needs have varied. One can think of the analogy of a factory that is being improved over time but where drastic changes are very challenging. Typically organizational structures, labor laws, and past mergers also affect the ability to adopt to change. These types of bottlenecks are not only specific to IT.

The reasons for enterprises to look for sourcing models beyond in-house models can be based on internal observations and need. On the other hand, pure IT vendors have developed from hardware and software houses to SPs. These vendors have actively developed models for outsourcing offerings. In the following chapters I go through sourcing models where an external vendor is involved.

5.3 Single-vendor

The single-vendor sourcing model was the first typical way to approach IT outsourcing. In this model most of the IT responsibility is transferred to an external company or to a joint venture with an IT services company. In practice the workforce from the original IT department also got transferred to the payroll of the new company. The basic idea was to outsource the IT work to a provider who is specialized in IT services and who could deliver the needed services in a more cost-effective way while improving the quality.

A big outsourcing deal enables economies of scale and hence provides the possibility to, for example rationalize the delivery of project and support services. As part of this rationalization the services improve but typically it also means that less staff is needed to provide the services. For this reason, the first round outsourcing arrangements are typically linked to human resource actions as well. On the other hand, changing from an in-house IT department to an IT services company can also provide further career opportunities for the staff.

Single-vendor outsourcing has been criticized for creating a lock-in situation from the enterprise's point of view. "Outsourcing entire business services to a single prime supplier may run additional risks" (OGC, 2007b, p. 158). The deals are typically multi-year and require a long contract term for the business benefits to realize. In many cases enterprises have started to look for more flexible models (for example, the dual-vendor model) after the first round of outsourcing.

5.4 Dual-vendor

The dual-vendor sourcing model is the next step in the IT sourcing model evolution. It still enables a fairly large outsourcing deal size while setting a more competitive environment for the SPs.

There are multiple ways to split the procurement of services into two. One might consider buying infrastructure services from one provider and trusting another one to provide more application layer services. If a vertical split is not feasible, one could make a horizontal split based on business or application areas.

As the number of stakeholders is increasing there is more management in a dual-vendor environment compared to single-vendor outsourcing. When the delivery areas of the two vendors are not fully locked, the enterprise can gain benefits by having two resource pools available to work, for example on investment projects.

5.5 Multi-vendor

The multi-vendor sourcing model is at the center of this study. It is a setup where the enterprise has made the decision to invite multiple vendors to provide the services needed. Compared to the big deal size of single- or dual-vendor environments, the sizes of the deals in an MVE vary. Usually the size of the vendor also reflects the deal size. This is related to the service delivery models as a big vendor can seldom deliver small services in a competitive way. Also a small vendor would have a hard time proving it could scale to deliver a bigger-than-usual service.

In an MVE the reasoning why enterprises choose a certain vendor for a certain responsibility is much more diverse compared to the dual-vendor model. There is less discussion about cost and lock-in scenarios and the focus is on further value-adding measurements, such as the availability of niche skills.

In Table 7 we can see common motivations for outsourcing decisions. The information is based on a review of IT outsourcing articles (Lacity, Khan, & Willcocks, 2009, p. 132).

Table 7. Motivations for IT outsourcing (Lacity et al., 2009, p. 132)

Motivation	Description	#
Cost reduction	A client organization's need or desire to use outsourcing to reduce or control IS [information system] costs	39
Focus on core capabilities	A client organization's desire or need to outsource in order to focus on its core capabilities	24
Access to expertise/skills	A client organization's desire or need to access supplier(s) skills/expertise	18
Improve business/process performance	A client organization's desire or need to engage a supplier to help improve a client's business, processes, or capabilities	17
Technical reasons	A client organization's desire or need to gain access to leading edge technology through outsourcing	10
Flexibility	The ability to adapt to change	7
Political reasons	A client stakeholder's desire or need to use an outsourcing decision to promote personal agendas such as eliminating a burdensome function, enhancing their career, or maximizing personal financial benefits	5

Change catalyst	A client organization's desire or need to use outsourcing to bring about large-scale changes in the organization	4
Commercial exploitation	A client organization's desire or need to partner with a supplier to commercially exploit existing client assets or form a new enterprise	3
Scalability	A client organization's desire or need to outsource to be able to scale the volume of IS [information system] services based on demand	3
Access to global markets	A client organization's desire or need to gain access to global markets by outsourcing to suppliers in those markets	2
Alignment of IS and business Strategy	The fit or congruence between a firm's business strategy (conceptualized as defenders, prospectors, analyzers) and its outsourcing strategy (e.g., arm's length, independent, and embedded)	2
Cost predictability	A client organization's desire or need to use outsourcing to better predict IS [information system] costs	2
Headcount reduction	A client organization's need or desire to use outsourcing to reduce the number of staff	2
Need to generate cash	A client organization's desire or need to generate cash through the sale of IT assets to the supplier	2
Rapid delivery	A client organization's desire or need to engage in outsourcing in order to speed up project delivery	2
Innovation	A client organization's desire or need to use outsourcing as an engine for innovation	1
Total articles		143

Even in an MVE it is important for the enterprise to understand which services it wants to keep in-house. These services would typically be at the core of the enterprise's business. It might be that there is not enough industry expertise available in the market for such services or that business-wise the enterprise cannot risk taking external parties into the heart of its research and development.

In some cases there is one supplier acting as SI for multiple vendors for the enterprise. Formally this is more of a single-vendor approach and is not considered a multi-vendor scenario in this study. To be specific, an MVE in this study means that there are multiple vendors providing IT services to the consuming enterprise. The stakeholders of the enterprise are IT savvy to the extent that ITIL best practices can be applied in the interface.

5.6 Summary

In this chapter high-level steps for IT outsourcing were introduced and, specific to this research report, the MVE was defined. It should be noted that choosing an IT sourcing method for an enterprise is a strategy-based decision.

The global trend is moving away from giant outsourcing deals due to the fact that the outsourcing market has matured. Most enterprises are on second or further outsourcing rounds and are actually focusing more on taking the correct strategy-based decisions in an MVE. As one approach does not always work with all enterprises there are big companies that still have their own IT department or who decide to renew their multi-year single-vendor outsourcing contracts.

6. METHODOLOGY

6.1 In general

The methodology chapter explains how this research has been conducted in order to solve the overall research problem and provide answers to the research questions. The aim is also to familiarize the reader with some concepts and briefly explain the decisions taken in method adoption.

The basis for the study was to do research based on qualitative analysis instead of quantitative analysis. There is a limited amount of existing research available on the application of ITIL in an MVE and therefore collecting non-structured data through experts' interviews seemed to be a fit-for-purpose approach.

6.2 Literature review

The aim of the literature review is to introduce the specific field of science and the main concepts to the reader. In this case the main concepts are ITSM, ITIL best practices, ITIL problem management, and MVEs. Further, the aim is to document the current level of research in this field of science.

Several university level databases were used to find relevant research papers, as well as internet search engines. Appendix I: Data sources and keywords, found at the end of this report, lists details of the different databases and search terms used.

6.3 Data collection

The data collection method chosen for this study was expert interviews. There are different approaches for research interviews that are briefly described below.

6.3.1 Interviews

Structured interviews are predefined from a question and type-of-answer point of view. Typically, structured interviews are used when collecting data through large-scale phone interviews (Hirsjärvi & Hurme, 2010). The interviewer has very little flexibility in tailoring

the interview. In fact, the different question paths and exceptions also need to be predefined.

Non-structured theme interviews are by definition conducted with an open format. The interviewer lets the interviewee describe the phenomena in his or her own words without initially setting boundaries for the answer. These interviews are more like discussions where the previous answer defines the next question (Hirsjärvi & Hurme, 2010). For example, a psychologist might use a non-structured approach to understand a patient's condition.

Semi-structured theme interviews as a method land somewhere between predefined and non-structured interviews. The interview has a structure but the interviewer is not bound to follow it fully. For example, the interviewer can change the order of the questions and is also entitled to ask further questions outside the predefined path. "Thus, it fits the characteristics of semi-structured interviews that some viewpoints of the interview are pre-defined while some are not" (Hirsjärvi & Hurme, 2010, p. 47).

6.3.2 Interview approach

The semi-structured approach was chosen for this study as it allows a certain predictability in the output data. In addition, more details can be harvested from predefined questions and also viewpoints can be identified outside the predefined structure.

The developed interview structure is included in Appendix II: Interviews. The content is based on previous research, the available literature, and expert advice. The final form was also reviewed by the instructors of this study prior to starting the interviews. The interview structure was prepared in two languages, in English and in Finnish. Most of the interviews were conducted in the Finnish language.

6.3.3 Interviewee groups

In an outsourcing situation there are multiple stakeholders and interest groups. For this study the following interviewee groups were chosen:

- The client
- The ITIL consultant
- The SP

Client here means the professionals who primarily work in enterprises that do not have IT as their core business. These individuals have been directly involved in the management of IT services in an MVE. The management systems have been based on ITIL best practices. There were a total of four professionals from this group joining the interviews. The interviewees were identified through networking and LinkedIn searches.

ITIL consultant here means professionals who are process and method experts. Their focus is usually on consulting the client on how to arrange ITSM in their MVE and how ITIL best practices can be utilized. This group was chosen for inclusion here so that there was enough core ITIL knowledge as part of the research data. There were a total of three professionals from this group who joined the interviews. The interviews were agreed through contacting the CEO of an ITIL consulting company, and hence the interviewees are from one company.

SPs here means professionals who work in IT services companies who have had experience of setting up and delivering ITIL best practice-based services to multiple clients. As ITIL is a best practice framework, the default implementation of ITIL by different SPs varies slightly. There were a total of three individuals from the group who joined the interviews. The interviewees were identified through networking and LinkedIn searches.

6.3.4 Conducting the interviews

As hinted in the previous subsection there was a total of 10 interviews. Most of the interviews were conducted as phone interviews due to geographical distance and the schedule of the interviewees. The timing of the interview sessions was agreed at least one week prior to the interview and the interview structure was shared. Hence the interviewees had the possibility to orientate and prepare for the session.

The basic setup of an interview for the interviewer was a meeting room with a speaker phone and a digital MP3 recorder. The interviewer called the interviewee on a pre-agreed number and, after a short technical verification of the line and recording, the interview started.

One hour was reserved for each of the interviews. In practice this appeared to be good allowance as each interview finished a couple of minutes short of the 60-minute mark.

There was enough time to go through the predefined interview structure, discuss focus areas, and let the interviewee provide insight outside the structure as well.

The end result of the planned interviews was ten times sixty minutes of interview material and field notes from the interview on paper. None of the interviews were cancelled and there were no issues with the digital recording. The next step was the transcription of the digital recordings.

6.3.5 Transcription

The primary output of the interviews was ten hours of recorded expert opinions. The data was typed into transcription documents by a specialist agency that provided services for both Finnish- and English-based interviews. The transcription work was done by a pool of specialists and hence it is possible that not all of the transcriptions were made by the same person.

Transcription accuracy is a measure that needs to be decided upon in reference to the research subject. Different accuracy levels are often referred to with different transcription styles. In the following chapters common transcription styles are introduced.

Exact transcription means capturing all the aspects of spoken language to a written format. In addition to speech laughter and other expressions of feelings are also included (Tutkimustie, 2014). Typically exact transcription is used when doing research in the linguistics field.

Discourse transcription adds to the accuracy of exact transcription. It includes vocal inflections, sounds, and, pauses, for example (Tutkimustie, 2014). Discourse transcription is used in behavioral science.

Normal transcription is about capturing spoken language in a fairly exact way. For example, filler words, context unrelated to the interview, and the interviewer's affirming comments (such as like "yes, mmm, right, I see...") are left out (Tutkimustie, 2014). Normal transcription is commonly used for individual and group interviews in the fields of science where the content of the speech is of particular interest.

Normal transcription was chosen as the transcription style for this study. Its accuracy is adequate for our field of science as we are mainly interested in the opinions of the experts. Further, the way of speaking or emotions of the interviewees do not play a role in the analysis.

The transcribed interviews were received from the specialist agency in structured plain text format. The person speaking was clearly identifiable and the reduction of, for example, filler words from the flow of speech was clearly marked. As a post-transcribing task the interview documents were fully anonymized from the interviewee's points of view, as were references to enterprise names. During the interview the interviewees made a lot of references to their current and previous projects at different companies, and hence the masking decision was made as the interviewees could be identified through the content.

The next step was to input the written and anonymized interview data to the analysis phase, which is further explained in the next section.

6.4 The analysis method

As mentioned in Section 6.1, this study is based on a qualitative research approach. Content analysis was chosen as the analysis method for this study. The method is applied according to the principles described by Elo and Kyngäs (2008).

6.4.1 The inductive versus the deductive approach

Qualitative content analysis can be done with the inductive or the deductive approach. The inductive approach is used when no clear previous categorization exists for the phenomena or the categorization is vague. The deductive approach can be chosen when a previous model or categorization exists. An approach based on inductive data moves from the specific to the general, while the deductive approach moves from the general to the specific (Elo & Kyngäs, 2008).

As part of the semi-structured theme interviews of this study, certain viewpoints were presented based on previous literature and expert advice. These viewpoints are compliant with categories in content analysis. The categories held in the interviews and no changes to them were suggested by the interviewees. Therefore, prior to starting the detailed analysis

process the generic categories were available and a deductive approach was chosen for the process.

6.4.2 A structured versus an unconstrained categorization matrix

"If a deductive content analysis is chosen, the next step is to develop a categorization matrix" (Elo & Kyngäs, 2008). A structured categorization matrix is not altered during the analysis process. The purpose is to prove the compliance or non-compliance of a categorization with the research data. In the case of an unconstrained matrix, the categorization is formalized but changes are allowed to it during the analysis process. An unconstrained matrix is used instead of compliance testing when an existing model is to be improved.

For this study an unconstrained categorization matrix was chosen. This was due to the fact that generic categorizations existed while the subcategories needed to be found through the process. "When using an unconstrained matrix, different categories are created within its bounds, following the principles of inductive content analysis" (Elo & Kyngäs, 2008).

6.4.3 Coding and grouping

The raw coding process aims to identify all the potential benefits and success factors from the data. At this point of time it does not matter whether the finding is rare or common. Duplicate codes can also be created. The raw codes are then grouped into subcategories. To increase the abstraction level the subcategories are then mapped to the generic categories.

Table 8. Linkage between method, tool, and reporting terminology

Elo & Kyngäs (2008)	ATLAS.ti	This report
Sub-subcategory	Raw codes	Raw benefits & success factors
Subcategory	Merged codes	The key benefits & critical success factors
Generic category	Code family	Viewpoint
Main category	Super code	Research questions

6.4.4 The main process steps

Elo and Kyngäs (2008) state that regardless of whether an inductive or deductive approach is chosen, there are three main phases: preparation, organization, and reporting. The preparation phase contains the selection of the unit of analysis, deciding whether to analyse only the manifest content or the latent content as well, and becoming immersed in the data (Elo & Kyngäs, 2008). The unit of analysis for this study was chosen to be one transcribed interview. For the second question, analysing manifest content was the obvious option due to the previous choice on the level of transcription.

The organizing phase in the deductive approach starts with developing the unconstrained analysis matrix. The data is then coded, followed by grouping and categorization tasks. In the abstraction work the newly created categories are mapped with the analysis matrix. In this study the generic categories were part of the analysis matrix while the subcategories were identified through coding, grouping, and categorization work. Subsection 6.6 illustrates the practical steps taken in more detail.

In the content analysis process the reporting phase is an important factor for the overall reliability of the study. "To increase the reliability of the study, it is necessary to demonstrate a link between the results and the data" (Elo & Kyngäs, 2008). In this study Chapter 6 aims to document how the research was conducted from start to finish and to enable repetition of the overall study.

6.5 ATLAS.ti as the analysis tool

Content analysis was chosen as the primary method for analysis. With ten input documents a manual or spreadsheet based approach could be used to conduct the analysis. There are specialized computer-based applications that support the researcher in qualitative data analysis. ATLAS.ti is one such tool and is widely used and recognized in the academic community.

For this study the ATLAS.ti software license was available and it was chosen as the primary tool for the analysis phase. The tool itself has a lot of features and similar things can be done in multiple ways with it. Hence a specific course helped the researcher to get started with applying the tool in a consistent way.

The following subsections describe the key concepts and functionalities of ATLAS.ti that were chosen to be used as part of the analysis.

6.5.1 The hermeneutic unit

A hermeneutic unit is a term that describes the umbrella under which all the documents, tags, structures, views, and markings are stored. In practice it is a container for all this information. A hermeneutic unit can be stored as a bundle containing all the external files or as a reference file linking to different libraries. When using only one computer the lighter reference files can be used. During this research the main computer was changed once and the reference file did not work in the new computer. Hence the hermeneutic unit was transferred as a copy bundle containing all the referenced files.

6.5.2 The primary document

Primary documents contain the main data that is analyzed as part of the research. In this study there were ten primary documents, each containing one transcribed interview. The document format used was Microsoft Word 97-2003. As pointed out in Subsection 6.3.5, the input files were anonymized prior to analysis. Hence the expectation was that the primary documents would not be edited in the analysis program. In practice there were a couple of situations where further anonymity was required and so the edit mode of the software was used.

6.5.3 The secondary document

Secondary documents support the analysis work. In this study supporting documents were, for example, the predefined structure of the interviews, as well as the field notes collected for each of the interviews. Importing these as secondary documents to the tool allows easy access to all the necessary information and provides convenient archiving features when the copy bundle approach is used with the hermeneutic unit.

6.5.4 Quotation

Quotation here has the same basic meaning as in written text. Quotation is an extremely important concept within the tool as all the tagging of codes is done against quotations.

The tool also allows wide functionality for creating, modifying, merging, and removing quotations.

6.5.5 Coding

Coding is a central task in content analysis. The tool provide excellent bookkeeping functionality related to the codes, and code manipulation is also convenient during the process. One should prepare carefully for the coding work in order to have a consistent approach for the whole analysis. In practice it is recommended to do some test rounds with the chosen coding approach in order to ensure a meaningful and usable outcome from the coding phase. The coding approach chosen for this study is described in more detail in Section 6.6.

6.5.6 Decoding

Decoding means reversing the coding process done in the analysis. The purpose is to recover the original data and hence prove the coding. As part of this study, decoding was not tested. Still, care was taken to store enough information about the coding steps to enable decoding.

6.5.7 Memos

Memos within a hermeneutic unit mean a notepad that can be linked to, for example, specific rows in the primary documents. Memos are convenient for writing notes for later use. For example, if the analysis process gets interrupted it is practical to write a memo in a specific place in the text about the process phase and what should be done next. In this study memos were also used to write down ideas for future research.

6.5.8 Hypertext

Hypertext refers to structuring plain text to link it to other text, either within the same primary document or to other documents. This functionality was lightly used in this study to mark the few places in the text that required further anonymity. This approach was chosen to avoid, for example, interrupting a coding process and therefore being able to alter the primary document later.

6.5.9 Family

Family is a wrapper concept for grouping other entities. One can, for example, group primary documents into families or even more commonly one can form code families. The family construct is convenient from navigation, presentation, and reporting points of view. In this study the primary documents were assigned to families based on the background of the interviewee and the codes were grouped by viewpoint. Both of these families were crucial when built-in ATLAS.ti functionality was used to calculate the code occurrences presented in Chapter 7.

6.5.10 The query tool and super codes

The query tool was used to retrieve quotations based on codes and, for example, operands. Super codes are the stored search expressions of the query tool. In this study the possibility to use super codes for structuring the results was explored. It turned out that the support for nested queries was limited and other alternatives needed to be considered. In Section 6.6 one can find information for the naming standard of the codes and on a filtering tool that was used to structure the results.

6.5.11 Network views

Network views are a convenient way to visualize the pre-phases or results of the analysis. In this study the possibility to create a nested structure of the research questions, viewpoints, and codes was utilized. This network was further visualized as a network view and the end result is presented in Chapter 8.

6.6 Execution of the content analysis process

The content analysis process was executed with the help of the ATLAS.ti software program. To start with, ten anonymized interview files were imported to the tool as primary documents. In the next step, primary document families were created based on the language and interviewee group. Only the later document family had practical use in the reporting phase of the process.

As suggested by Elo and Kyngäs (2008), the researcher should be immersed in the data. Hence the primary documents were skimmed through prior to starting the actual analysis.

The researcher also needed to study the ATLAS.ti program in order to understand how to apply its rich functionality to the analysis process.

Starting the actual coding work required multiple iterations. Allowing many iterations was instructive for the researcher. For example, over the course of the iterations the scope of the quotations became more useful and the naming convention of the codes stabilized.

During the final coding round the researcher coded one primary document at a time. The coding was started from the beginning of the document and it was coded for the first and second research question in one go. There was no limit to creating new codes as the later process steps would handle the duplicates. In practice a lot of new codes were created with the first primary documents, after which code reuse started to occur. This was due to the fact that each primary document was based on the same interview structure and there was only one researcher conducting the coding work.

After the coding was finalized the grouping and categorization work was supposed to start. At this point of time the super code functionality of ATLAS.ti seemed insufficient for the presented nested structures. Therefore, a prefix-based naming convention for the codes was introduced. Adding the prefixes to the codes was fast and did not involve changes to the code names.

Initially the prefixes contained linkage information to the research question and viewpoint for the specific code. Now using the name-based filters in ATLAS.ti, it was convenient to fetch lists of codes with the prefix parameters. This enabled the final categorization work, which included the merging of codes within the same viewpoint. That said, there were no codes fully omitted from the results but rare codes ended up supporting more common codes through the merging and abstraction process.

When the coding, grouping, and categorization work was finished the "Codes – Primary Documents Table" feature was used to export statistics of the codes, code families, and the primary document's families to the spreadsheet format. This data is the basis for the results presented in Chapter 7.

6.7 Summary

In this chapter the methodology for conducting this research was described. The basis for the study was a literature review conducted with academic and non-academic literature. In order to collect further research data, a semi-structured theme interview was prepared. A total of ten interview sessions were conducted with professional contributors from different groups: clients, process consultants, and SPs.

The digital interview material was transcribed by a specialized agency, after which the documents were anonymized. Content analysis was chosen as the analysis method for the data and it was applied in the way Elo and Kyngäs (2008) suggest. To be exact, the variation was a deductive content analysis process with an unconstrained categorization matrix.

The analysis process was executed with the help of the ATLAS.ti software program. The result data was exported from ATLAS.ti to a spreadsheet format. The final calculations were done with Microsoft Excel before attaching the tables to the research report. The network view functionality of ATLAS.ti was used to export figures to support the discussion chapter in the research report.

7. RESULTS

7.1 In general

The previous chapter described how the data collection related to the first two research questions was conducted. In this chapter the respective results are presented. The results related to the third research question are derived from the results of the first two questions.

7.2 The first research question

"What are the key benefits of applying ITIL in an MVE?"

The first research question is about identifying the key benefits of applying ITIL in an MVE. Table 9 presents the 19 key benefits identified in this study. The findings are grouped under five different viewpoints. The statistics present how many times and by how many separate interviewees the benefit is mentioned for each interviewee group.

Table 9. The result data for the first research question

The key benefits categorized by viewpoints	All mentions			Unique mentions		
	CLIENT	CONSULTANT	PROVIDER	CLIENT	CONSULTANT	PROVIDER
CONTRACTUAL	**11**	**8**	**6**	**7**	**6**	**5**
ITIL terminology speeds up the contract process	4	3	2	3	2	2
ITIL terminology makes the resulting contracts more precise	7	4	3	4	3	2
ITIL contains the underpinning contract concept	0	1	1	0	1	1
FINANCIAL	**8**	**7**	**7**	**6**	**5**	**5**
ITIL can bring overall efficiency, leading to financial benefits	3	4	4	3	3	3
ITIL can be applied gradually, based on business needs	5	0	0	3	0	0
The ITIL concept of service assets can be used in investment decisions	0	3	0	0	2	0
ITIL ticket types can be linked to invoicing and sanctions	0	0	3	0	0	2
FUNCTIONAL	**25**	**13**	**9**	**13**	**9**	**7**
ITIL is a widespread and neutral best practice framework	6	3	3	4	3	2
ITIL best practices enable the fast ramp-up of services	9	0	3	4	0	2
ITIL provides common terminology for all stakeholders	8	5	2	3	3	2
ITIL helps with consistent vendor management	2	1	1	2	1	1
ITIL service assets help with vendor responsibility	0	4	0	0	2	0
PROCESS	**9**	**9**	**7**	**6**	**7**	**5**
ITIL provides best practice process templates	5	5	4	2	3	3
ITIL enables convenient E2E process integration with all suppliers	2	3	2	2	3	1
ITIL is one path to consolidate in-house IT services	2	1	1	2	1	1
QUALITY	**10**	**8**	**3**	**7**	**6**	**2**

ITIL contains KPIs for measuring efficiency	5	5	3	3	3	2
ITIL KPI history data is a comparable reference	0	2	0	0	2	0
ITIL provides a service life cycle model	2	1	0	2	1	0
ITIL contains the continuous improvement approach	3	0	0	2	0	0

7.3 The second research question

"What are the critical success factors when applying ITIL problem management in an MVE?"

The second research question is about identifying the key success factors when applying ITIL problem management in an MVE. Table 10 presents the 19 key success factors identified in this study. The findings are grouped under five different viewpoints. The statistics present how many times and by how many separate interviewees the success factors are mentioned for each interviewee group.

The identical number of key findings for the first two research questions is a coincidence. The findings are also grouped under the same viewpoints. These viewpoints were originally based on previous literature and expert advice. As part of the study the viewpoints were confirmed with each interviewee and no changes were suggested. To be precise, the validity of the viewpoint structure was discussed separately for both research questions. The numerical data is included in the results in order to answer the third research question.

Table 10. The result data for the second research question

	All mentions			Unique mentions		
The critical success factors categorized by viewpoints	**CLIENT**	**CONSULTANT**	**PROVIDER**	**CLIENT**	**CONSULTANT**	**PROVIDER**
CONTRACTUAL	**27**	**15**	**29**	**12**	**9**	**12**
Problem management should be included in the contract	9	3	5	4	3	2
The contract must state the responsibility area of the supplier	13	5	7	4	3	3
The SI role must be defined and linked to contracts	0	3	12	0	1	3
Suppliers should be bound to a common SLA in the contracts	2	3	4	2	1	3
Contracts can include rewards for preventing a major incident	3	1	1	2	1	1
FINANCIAL	**15**	**11**	**3**	**10**	**6**	**2**
The problem management's focus should be chosen with biz as a priority	6	4	0	4	2	0
Problem management needs adequate resourcing	6	3	2	3	2	1
Use proactive problem management to avoid business interruptions	2	2	0	2	1	0
Supplier competition is good when pricing but not during delivery	1	2	1	1	1	1
FUNCTIONAL	**9**	**3**	**8**	**6**	**3**	**6**
Tooling should support problem management	6	2	4	3	2	3
Keep it clear which suppliers are involved in business-critical processes	2	0	2	2	0	1

Have a barrier to entry for reactive problem tickets but not for proactive	1	1	2	1	1	2
PROCESS	**5**	**0**	**5**	**4**	**0**	**4**
The problem management process should be tailored to the need	3	0	0	2	0	0
A problem's record status should be followed and communicated	1	0	4	1	0	3
The ITIL problem management process doesn't describe supplier change	1	0	1	1	0	1
QUALITY	**15**	**5**	**11**	**7**	**3**	**8**
Problem management requires long-term planning and follow-up	8	3	5	3	2	3
Business-critical E2E processes must have control points and KPIs	6	0	3	3	0	2
All suppliers need to have problem management experience	0	2	1	0	1	1
A KEDB should be created and not be given away	1	0	2	1	0	2

7.4 The third research question

"Do stakeholders recognize these key benefits and critical success factors?"

The third research question is about how the different interviewee groups focus on the given viewpoints in the first and second research questions. Table 11 presents the percentage split calculated from the data in Table 9 and Table 10.

The percentage split has been calculated for each viewpoint and research question. The fact that there where was one more interviewee in the client group has been handled in the calculation. The percentage refers to how many interviewees from each interviewee group mentioned (and hence recognized) the listed key benefit and key success factor. It should be noted that there were a different number of findings under the five viewpoints for the two research questions (as illustrated in Table 9 and Table 10), hence the percentages are based on different amounts of source data for each viewpoint.

Table 11. The result data for the third research question

	Research question 1			Research question 2		
Viewpoints	**CLIENT**	**CONSULTANT**	**PROVIDER**	**CLIENT**	**CONSULTANT**	**PROVIDER**
CONTRACTUAL	32 %	37 %	31 %	30 %	30 %	40 %
FINANCIAL	31 %	34 %	34 %	48 %	39 %	13 %
FUNCTIONAL	38 %	35 %	27 %	33 %	22 %	44 %
PROCESS	27 %	42 %	30 %	43 %	0 %	57 %
QUALITY	40 %	45 %	15 %	32 %	18 %	49 %

7.5 Summary

In this chapter the results for all three research questions were presented. The first research questions were studied through professional interviews and qualitative content analysis method. The five viewpoints used to categorize the findings are also results of this study. The viewpoints were confirmed as part of the interviews.

The results of the third research question were calculated based on the results from the first two research questions. The provided results are discussed in Chapter 8. To support the discussion, a graphical presentation of the results is also provided.

8. Discussion

8.1 In general

In the previous chapter the core results of the study were provided. This chapter focuses on exploring the results in more detail and discussing the meaning of the results. In addition to going through the results, the limitations of the conducted research are elaborated on. Further, recommendations about how to continue the research in this domain are given.

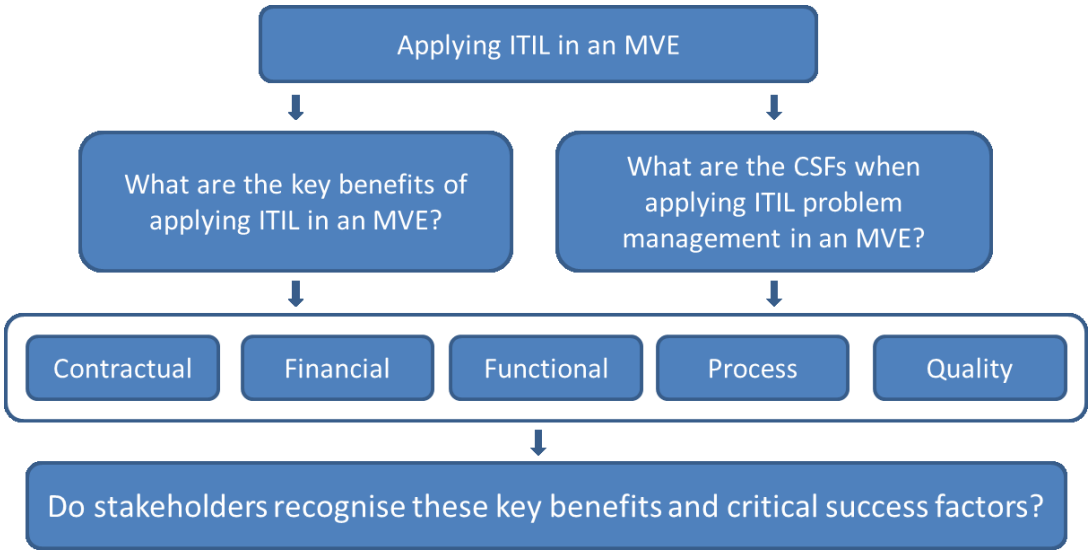

Figure 7. Linkage between the research problem and the research questions

Figure 7 illustrates the relation of the research questions and how the questions are inter-linked. The results of the first two questions are based on professional interviews and are reliable to decent extent. The results related to the third question are more subjective as they rely on a limited number of informants.

8.2 The key benefits of ITIL in an MVE

The results of the first research question are categorized under five viewpoints, formed as discussed previously. The different viewpoints – contractual, financial, functional, process, and quality – are illustrated in Figure 7. In the next subsections the different viewpoints and results attached to respective viewpoints are discussed.

8.2.1 The contractual viewpoint

The contractual viewpoint covers all results related to contracting during the whole life cycle of the MVE. For example, there are findings related to the initial contract negotiation situation, recommended content for the contracts, and hints as to what ITIL has to offer related to subcontractor agreements. Figure 8 describes the findings related to the first viewpoint.

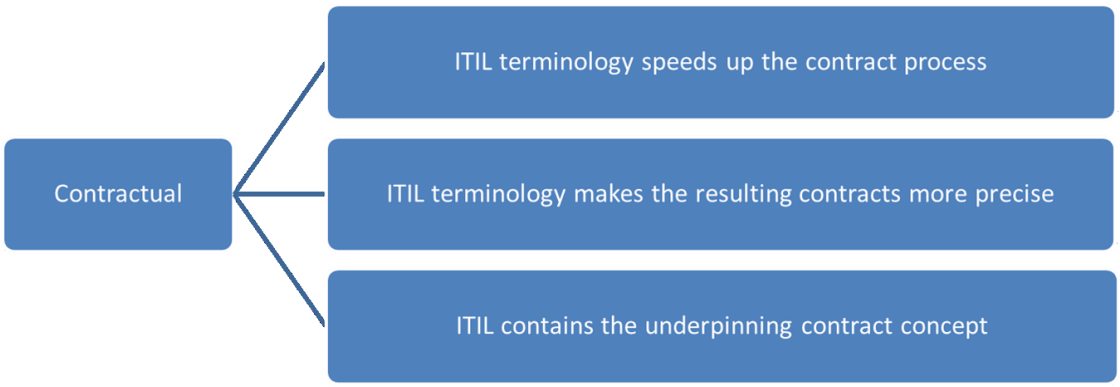

Figure 8. The contractual viewpoint on the first research question

ITIL terminology speeds up the contract process. ITIL provides common terminology that can already be used during the contracting phase. The terminology is defined in the ITIL Glossary and is available in multiple languages. The fact that all parties use same terminology and that common structures are available speeds up the contract process. In practice the conceived terminology expands to the existence of different ticket types – for example, incidents and problems – and structures like KPIs.

ITIL terminology makes the resulting contracts more precise. As a distinct finding it is stated that the contracts written with ITIL terminology are more precise compared to freeform ones. With long-term service contracts it is typical that the contract presentative from both parties can change over time. From this perspective it is useful that the contract text is easy to understand and there is little room for interpretation. Also, from the operative point of view, being able to bind operative actions to the contract text is an asset. One does not always need to consult a legal expert when checking details from the contract for operational purposes.

ITIL contains the underpinning contract concept. It is a key benefit that ITIL contains the concept of underpinning contracts. This contract model is used to make an agreement between an

IT SP and a third party. There is a common need to agree about responsibilities and the end-to-end targets related to primary SLAs.

8.2.2 The financial viewpoint

The financial viewpoint is about all the benefits that are related to finances. For example, general gains, understanding the service assets, and the practicalities related to invoicing. Figure 9 illustrates the findings related to the financial viewpoint.

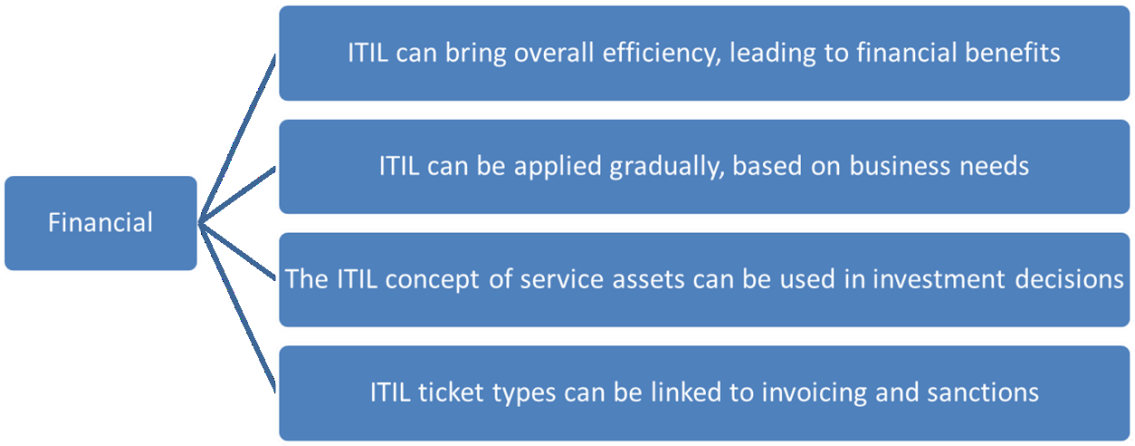

Figure 9. The financial viewpoint on the first research question

ITIL can bring overall efficiency, leading to financial benefits. ITIL is a best practices framework that can deliver overall financial benefits if applied correctly. The processes need to be tuned to the need of the target organization. Overall efficiency can be gained if the framework is applied wisely. On the other hand, too heavy application of the framework, for example, can lead to negative impact. In the case of business interruption, the fast recovery of services is expected and here ITIL is an enabler.

ITIL can be applied gradually, based on business needs. Even though the ITIL framework provides a full blown life cycle model it can be applied gradually. As in business in general, investments should be made based on need, and ITIL supports the application of a limited set of processes and also the later expansion of coverage.

The ITIL concept of service assets can be used in investment decisions. ITIL service assets enable us to understand what capabilities and resources are involved in a particular service. This information contains details like the cost of using certain resources. Further, this

understanding of the costs related to service assets can be used when making investment decisions related to services.

ITIL ticket types can be linked to invoicing and sanctions. As a direct practical matter ITIL defines different ticket types that are conveniently linkable to the invoicing of services. Similarly SLAs contain structures which can be used to define the sanction model in case targets are not met.

8.2.3 The functional viewpoint

The functional viewpoint includes the general matters helping make service leading easier in an MVE. For example, findings related to the neutrality of the framework, the ramp-up of services, and arranging vendor management are included. Figure 10 illustrates the detailed findings on this viewpoint.

Figure 10. The functional viewpoint on the first research question

ITIL is a widespread and neutral best practice framework. ITIL is very widespread best practices framework and it is used globally. The availability of translations has also boosted the adoption where localization is needed. The framework being vendor neutral helps its adoption in MVEs. In fact most of the global consulting companies are already adopting ITIL with in-house processes.

ITIL best practices enable the fast ramp-up of services. If, for example, we compare the creation of operational processes from scratch with the tuning of existing best practices, the benefit of ITIL is clear. The ramp-up of services is faster when tuning process templates is enough.

Also there is more confidence that sufficient process areas are in place when comparisons with a best practice approach can be made. SPs tend to have experience of ITIL processes and also commonly have ITIL compliant tooling in place.

ITIL provides common terminology for all stakeholders. In an MVE there can be internal and external SPs, including underpinned third parties. In addition to service organization there can be project side players needing to co-operate with the services. Altogether this group of people can be vast in headcount and having simple and straightforward common terminology is an asset that makes operational processes run faster.

ITIL helps with consistent vendor management. When the client organization chooses to function as an SI, SP management also needs close attention. The ITIL life cycle model, concepts, and terminology help with consistent SP management. When, for example, all the SPs adhere to similar contracts, invoicing principles, and SLAs, management is easier and more fault tolerant. It should still be noted that managing multiple SPs involves considerable work that should be planned for.

ITIL service assets help with vendor responsibility. Defined service assets help understand the current vendor responsibility. Revise assets and configuration management processes ensure that the information is kept updated. This also helps with the common "not my issue" situation in an MVE as responsibilities are better known and information is available to different stakeholders.

8.2.4 The process viewpoint

The process viewpoint contains direct findings related to the best practice processes. For example, findings related to process templates and process integrations are included. Figure 11 contains the exact findings on this viewpoint.

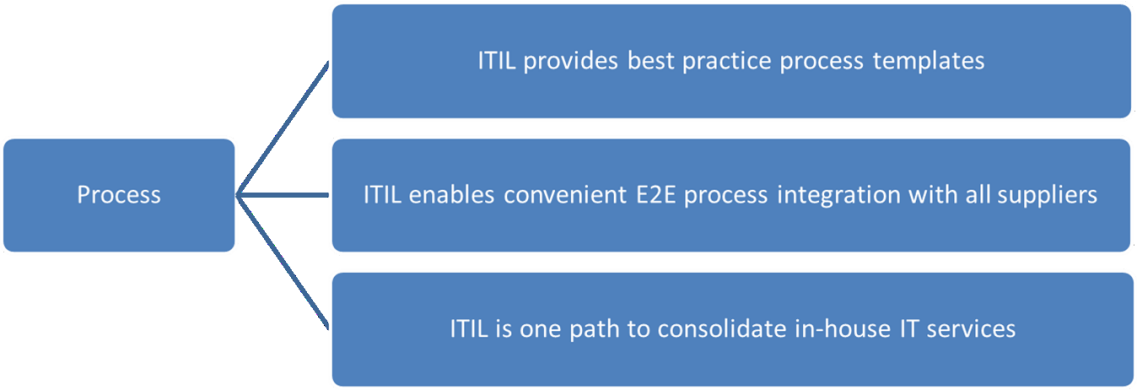

Figure 11. The process viewpoint on the first research question

ITIL provides best practice process templates. The ITIL framework contains process templates that can be used with little tuning. Commonly the basic idea of the process template is preserved and only the application differs. This is an asset in the MVE. To mention one specific template, the availability of the problem management process is a key benefit.

ITIL enables convenient E2E process integration with all suppliers. It is common that the SI and SP processes need to be integrated. This is especially the case when the SP is delivering services based on an existing factory model. The opposite of this situation would be if all service resources start using the end-to-end process of the SI. In cases where the SI and SP are using ITIL processes, the integration can be done conveniently.

ITIL is one path to consolidate in-house IT services. The concept of an MVE also applies to situations where the SPs are from in-house organizations. The application of ITIL best practices is one way to consolidate in-house IT services.

8.2.5 The quality viewpoint

The quality viewpoint contains the findings related to, for example, KPIs and continuous improvement. Figure 12 contains the exact findings on this viewpoint.

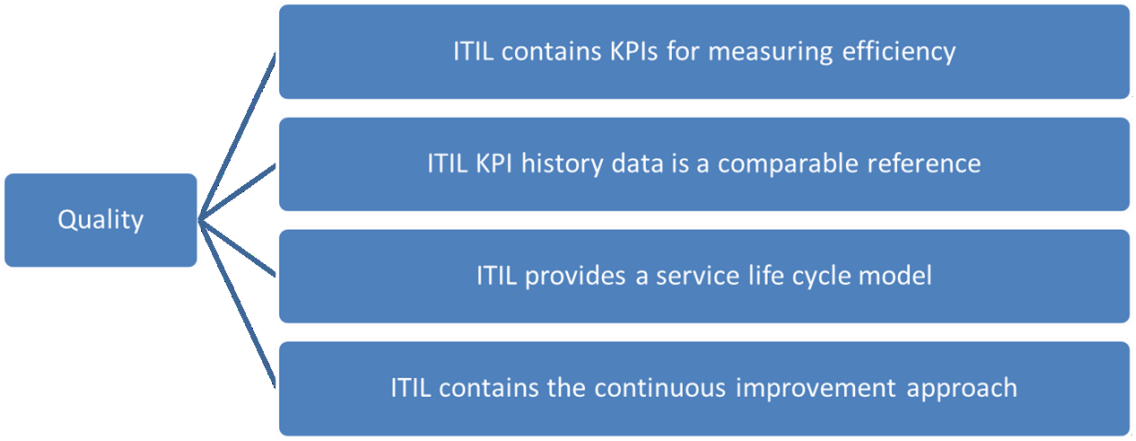

Figure 12. The quality viewpoint on the first research question

ITIL contains KPIs for measuring efficiency. The availability of predefined KPIs is related to quality in an MVE. The KPIs can be used to measure the end-to-end process efficiency. If the KPIs are included in the underpinning contracts, all involved organization are in line with the expected quality.

ITIL KPI history data is a comparable reference. When a client has decided to buy an ITIL based service it can use the ITIL KPI data as a validating point when comparing vendors. Similarly vendors can show the history data from permitted existing services. If the vendor has a track record of delivering a similar type of service with good KPI records, it is a good reference.

ITIL provides a service life cycle model. The fact that ITIL has a built-in service life cycle model affects quality in an MVE. Best practice process templates exist for different phases of the service life cycle.

ITIL contains the continuous improvement approach. In addition to the life cycle model, ITIL contains a built-in continuous improvement model. The fact that the service and operations are continuously monitored and improved has a direct impact on quality. The continuous improvement of services also requires the continuous education of stakeholders, assuming that, for example, new process areas are taken into use.

8.3 The critical success factors of ITIL problem management in an MVE

The results of the second research question are categorized under the same five viewpoints as in the first research question. The different viewpoints – contractual, financial, functional, process, and quality – are illustrated in Figure 7 and described in Section 8.1. In the next subsections the different viewpoints and the results attached to respective viewpoints are discussed.

8.3.1 The contractual viewpoint

The contractual viewpoint covers all results related to contracting and illustrates how contracting can help making problem management a success. For example, there are findings related to the responsibility setting, rewards instead of penalties, and the SI role. Figure 13 describes the findings related to the first viewpoint.

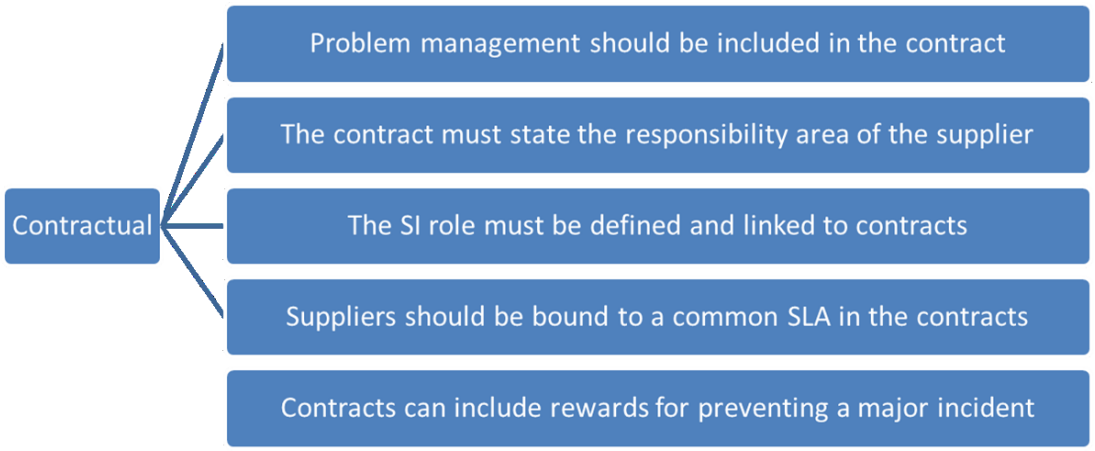

Figure 13. The contractual viewpoint on the second research question

Problem management should be included in the contract. It is common to see incident management and related KPIs covered carefully in service contracts. A similar approach should be used with problem management to get the necessary focus to the topic from the start. Problem management also requires a budget and resources that should be part of the service solution. The difference between proactive and reactive problem management should be noted in the service solution that the contract is based on.

The contract must state the responsibility area of the supplier. With problem management coordination plays a key role. Hence, in addition to technical responsibilities, coordination responsibilities should be noted in the contract. In some cases a vendor-specific SPOC for

problems should be considered. This SPOC role can also be called problem manager, and with smaller services the service manager can also play the role. Regardless of whether SPOCs are used or not, the suppliers need to interact properly and have the contractual authority to do so.

The SI role must be defined and linked to contracts. The SI role is very important for well-functioning problem management. In the way that an MVE has been defined in this study the client organization is assumed to have the SI role. How vendors function under the SI should be defined in the service contract. The client side of the staff managing the SI role must be skilled and play an active role.

Suppliers should be bound to a common SLA in the contracts. An SLA is more common with incident management than problem management. This is because problems generally have a longer and less predictable resolution time. In order to commit to specific resolution times SPs would need to add capacity to the service team that is not needed in the average service delivery. Still, SLAs are an important topic because vendors need to feel that they are in the same boat in an MVE. All vendors need to have a sense of urgency in improving the common solution.

Contracts can include rewards for preventing a major incident. Contracts tend to have penalties that are applied in the case that the expected service quality is not met. In addition to this, contracts can include rewards to vendors (where they can be justified through the enterprise's business case). For example, if a vendor can prevent a major incident from occurring it could receive a reward for keeping the business running.

8.3.2 The financial viewpoint

The financial viewpoint is about all the benefits related to finances. For example, there is prioritization advice, recommendations on resourcing, and discussion of when competition between vendors affects the service. Figure 14 illustrates the findings related to the financial viewpoint.

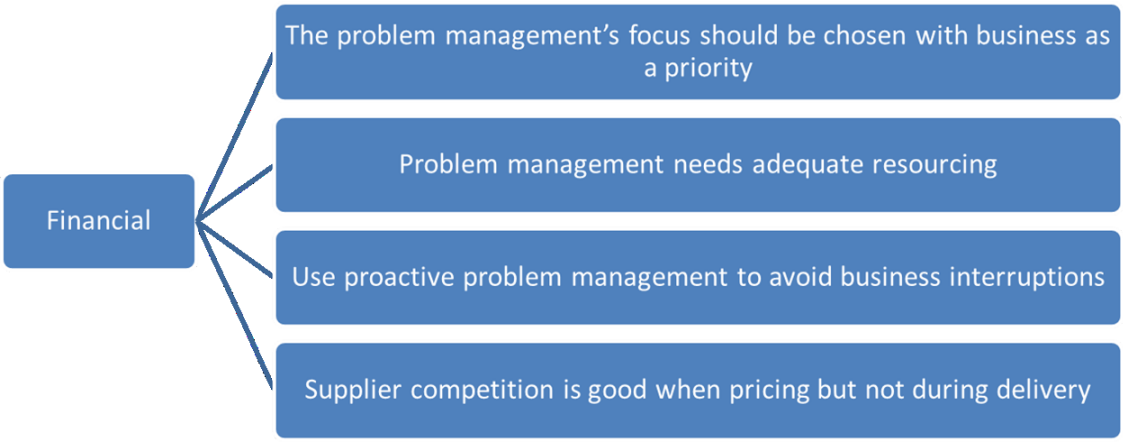

Figure 14. The financial viewpoint on the second research question

The problem management's focus should be chosen with business as a priority. A completely normal case is that there are more problem management activities than the budget allows. The quality of service needs to be sufficient but does not need to be much above the same limit. The justification is that with a certain amount of money the sufficient level is reached, while going above it costs comparatively much more. Hence business priorities should be followed when deciding where to focus problem management efforts. Usually investigation of the problem can be done and the decision of whether to invest in removing a particular root cause is done separately.

Problem management needs adequate resourcing. Conducting continuous problem management needs adequate staffing. Reserving these resources for problem management is a general investment decision while the focus of the investment can be decided on a case-by-case basis, based on business priority. Depending on the size of the enterprise there can be dedicated process owners and process managers assigned. It is also recommended to reserve capacity from the vendor teams for problem management in addition to, for example, incident management.

Use proactive problem management to avoid business interruptions. Interruptions to an enterprise's business can be costly. Proactive problem management is one of the inputs to the problem management process and should be used to identify upcoming business interruptions. When an upcoming problem can be identified in advance, investing in problem management has a clear business case.

Supplier competition is good when pricing but not during delivery. One of the many characteristics of an MVE is a competitive situation between the vendors. Customers are looking for many benefits from an MVE, as mentioned in Chapter 5. One of these is a better price level compared to a lock-in situation with a single vendor. Competition is beneficial when negotiating new contracts but can lead to issues if harsh competition continues during the delivery phase. When the delivery starts all the vendor teams should be able to work together and be able to focus on common goals.

8.3.3 The functional viewpoint

The functional viewpoint includes general matters helping make problem management easier in an MVE. For example, findings related to tooling, organization maps, and rules for raising problem tickets are included. Figure 15 illustrates the detailed findings on this viewpoint.

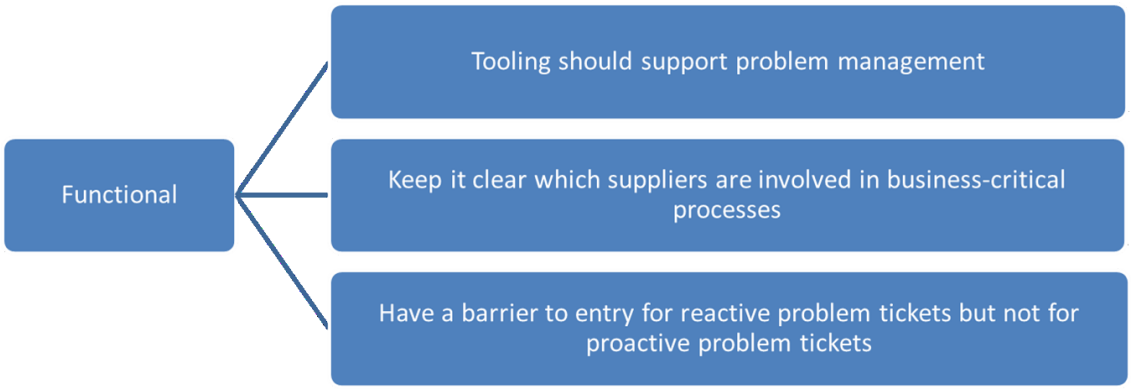

Figure 15. The functional viewpoint on the second research question

Tooling should support problem management. Adequate tooling should be arranged to support ITSM as a whole. Problem management, as a subset of ITSM, needs to be included in the tooling functionality. It is important that all stakeholders in the MVE can access the problem records for the latest information and have the means to provide updates to the tickets as well. The tool could also have a feature that monitors the progress of the problem resolution. In cases where the responsibility for the ticket is going back and forth between teams, the tool could send an event to the SI representative.

Keep it clear which suppliers are involved in business-critical processes. Sometimes we focus on distinct information systems when managing IT services. In practice the enterprise's

business process often spans multiple systems. In an MVE this means that the responsibility for the process flow, from an IT perspective, also crosses vendor boundaries. Hence it is practical to not only have a phonebook available in an MVE but to describe vendor responsibilities in different parts of the business process.

Have a barrier to entry for reactive problem tickets but not for proactive problem tickets. Clients and vendors sometimes disagree whether problem records should be raised or not. Clients say that vendors sometimes open problem records too soon to get around the incident SLA. Vendors tend to say that clients demand things to be solved as part of incident management while the issue at hand is actually a problem. The difference in the latter case is bound to the financial models used in the service contracts. In some cases it is recommended that rules are set when an investigation can move from the incident domain into the problem domain. Nevertheless, there should be no barriers to raising proactive problem records as business prioritization will take place prior to any work starting.

8.3.4 The process viewpoint

The process viewpoint contains direct findings related to the problem management processes. For example, findings related to process tailoring and problem record monitoring are included. Figure 16 contains the exact findings on this viewpoint.

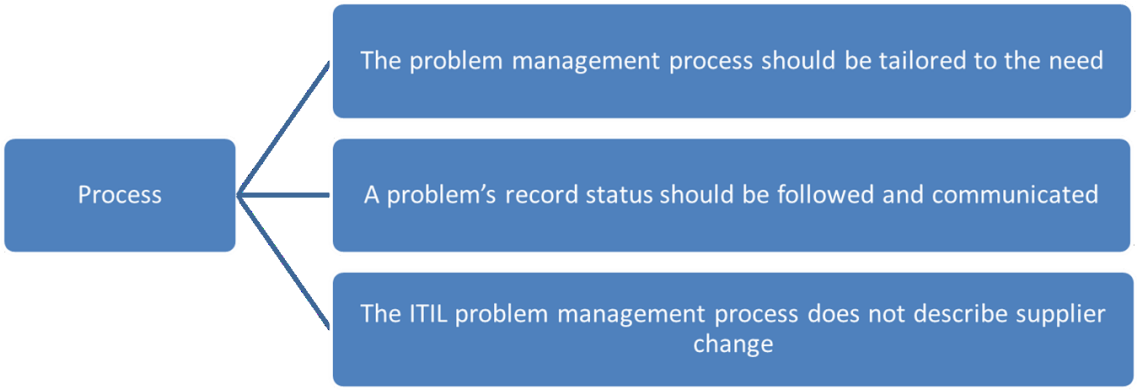

Figure 16. The process viewpoint on the second research question

The problem management process should be tailored to the need. ITIL is a best practices framework and the intention is to provide general process templates that should then be tailored to the needs of the enterprise. Specific to an MVE is that care should be taken where control points are specified. These can easily become bottlenecks in an otherwise functional

process. It should also be considered what should trigger the problem management process. For example, major incidents are often linked to creating a problem record.

A problem's record status should be followed and communicated. Identified problems can have quite different natures. Some problems can directly affect an enterprise's ability to do business – that is to say, a vital business process is interrupted. Other kinds of problem might not interrupt a business process but can still consume resources that could be utilized in a more productive way, for example, when time is spent on executing a workaround repeatedly. For the first type of problem the status information is usually recent and communication takes place naturally. For the second type of problem the challenge might get buried in the tooling and no continuous follow-up takes place. The key thing is to understand the business impact of each problem and drive the resolution work with the needed intensity.

The ITIL problem management process does not describe supplier change. The ITIL problem management process is an extensive template but does not describe the change of supplier by default. This is something that is still important in an MVE. When tailoring the process for an enterprise's use the question must be addressed. For example, there can be rules on how the lead responsibility can be changed between suppliers or the customer in an SI role can assign the responsibility based on the latest development in the resolution work.

8.3.5 The quality viewpoint

The quality viewpoint contains the findings related to KPIs and KEDBs, for example. Figure 17 contains the exact findings on this viewpoint.

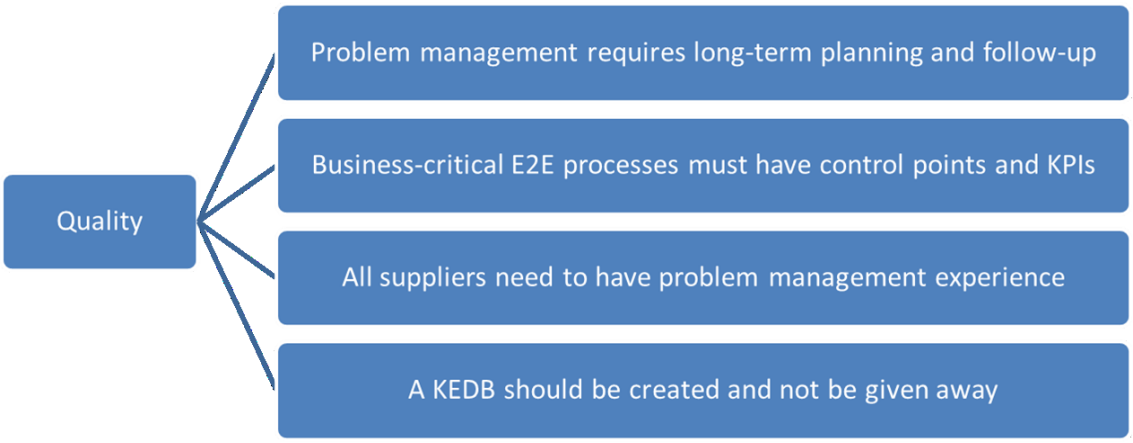

Figure 17. The quality viewpoint on the second research question

Problem management requires long-term planning and follow-up. Achieving quality in problem management requires long-term planning and follow-up. This means that one should not only focus on how to solve a particular problem but also on what long-term facilities should be enabled. Usually the budget priority is on new features to the systems that enable better usability or even further business. Hence problem management stakeholders need to be able to articulate the business case by doing problem analysis and removing root causes. Long-term trust should be built by extending KPI analysis to problem management with at least a twelve-month time span.

Business-critical E2E processes must have control points and KPIs. IT systems enable business processes that commonly span multiple systems. These processes should be managed in an end-to-end (aka E2E) manner, also from an IT perspective. This includes setting control points and defining KPIs. The aim should be that all subsystems are monitored on a common level and special attention is given to integration points. The monitoring and reporting should be planned in such a way that it also enables proactive problem management. This requires a good understanding of the business process in question, clear leadership, and a continuous focus from the technical teams.

All suppliers need to have problem management experience. A similar and good level of understanding of problem management between the suppliers in an MVE accelerates quality. An understanding of problem management should be present on all organizational levels. Contracting personnel need to be aware what to demand and what should be included in the written contracts. Operational managers need to be aware of their facilitating or communications roles. Technical staff needs to understand how to contribute as part of the problem solving team and how their work impacts the overall business process. Clients can demand a certain level of pre-understanding and experience from the suppliers but it is still important to organize environment-specific trainings in problem management to keep all the suppliers on the same page and improve co-operation.

A KEDB should be created and not be given away. The KEDB contains information about the issues currently affecting the systems. These issues have already been analyzed and there should be at least a workaround available to solve related business process issues. If the system is new the known errors can also be inherited from the system development projects. This KEDB repository is important to build and it should be owned by the customer. Should the supplier of the service change, the KEDB should not be lost in

transit. Hence it is important that KEDBs and similar assets remain in the service, regardless of who is supporting it.

8.4 Do stakeholders recognize these key benefits and key success factors?

The third research question is about how well the different interviewee groups recognize the findings from the first two questions. This split is illustrated as a percentage of all distinct acknowledgements of the findings given during the interviews. When all three groups have a one-third weight of the specific viewpoint then the correct interpretation is that all groups recognize the topic evenly. Further, if an interviewee group has a zero percentage on a viewpoint, it means that no clear point was presented in the scope of the given research question. Graphical presentation of the percentages is given for both research questions to better illustrate the split.

8.4.1 The first research question

The first research question was about identifying the key benefits of applying ITIL in an MVE. The split of recognition is illustrated in Figure 18.

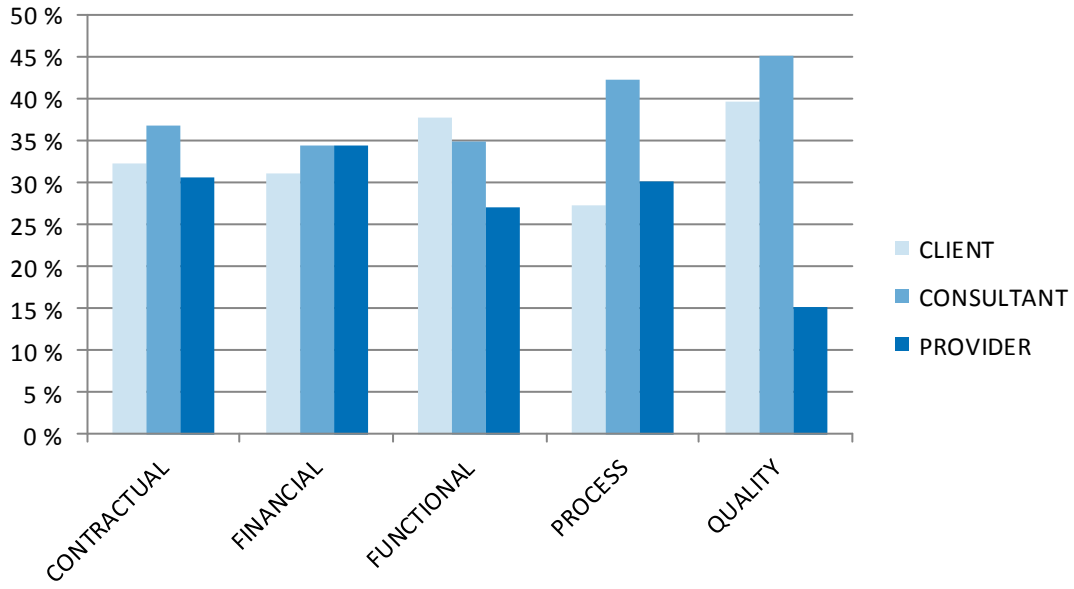

Figure 18. The split of recognition of the interviewee groups for the first research question

There are two general observations that can be made about the split. The first is that ITIL consultants seem to score highly on all the viewpoints. The consultant's role is generally to help client organizations to tailor and deploy ITIL best practices. With this assumption they also see more different service set-ups than their colleagues in client and supplier organizations. Therefore, it is natural that consultants can provide a wider range of findings compared to the two other groups.

Secondly, the overall variance in recognizing the key benefits from different viewpoints is not drastically high. For the contractual, financial, and functional viewpoints the split score is relatively balanced.

ITIL consultants had the most to say on process questions, which was also expected. Even though many IT workers are to some extent applying ITIL in their work, the application does not span to the whole best practice framework. ITIL consultants by profession are well aware of the different details of the framework.

For quality topics, SPs recognized less key benefits in this study compared to other interviewee groups. Even though all the stakeholders commonly agree that quality is important, it might be that the quality as a concept is not as much discussed on the vendor side. The rhetoric could be more on "keeping the services running," compared to "How can we improve the quality?"

8.4.2 The second research question

The second research question was about identifying the key success factors when applying ITIL problem management in an MVE. The split of recognition is illustrated in Figure 19.

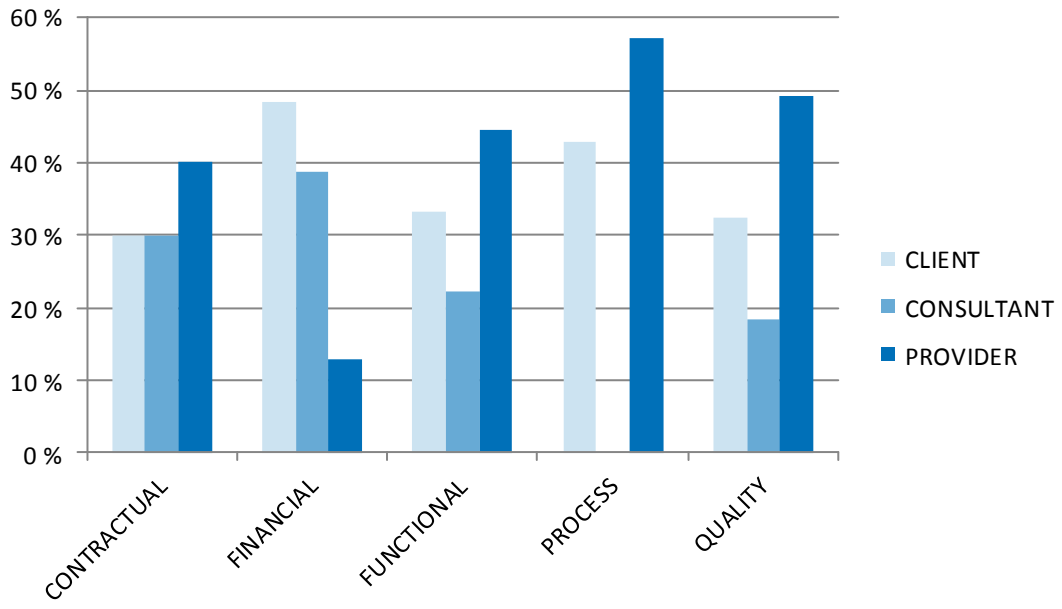

Figure 19. The split of recognition of the interviewee groups for the second research question

Compared to the split in the first research question the split is now less balanced. For four out of the five viewpoints suppliers had the most findings marked. It should also be noted that ITIL consultants had the least markings for the second research question. This is totally the opposite to the case with the first research question. From the contractual viewpoint all the groups recognized a relatively similar level of findings. Suppliers have a slightly higher score but are still within the same range as the others.

From the financial viewpoint suppliers flag clearly less findings compared to the others. The findings for this viewpoint were related to, for example, the prioritization of budgets and the business case while avoiding service interruptions. It could be that these types of topics are more discussed in client and consultant organizations.

From the functional viewpoint we can see that ITIL consultants have marked fewer findings than clients and suppliers. The findings were quite practical and it might be that the consultants do not handle topics on this level in their assignments. The suppliers recognized a few more key success factors compared to clients.

Surprisingly ITIL consultants did not mark process related findings as part of this study. No clear reason for this can be seen from the data. A key finding related to process was

that a change of supplier is not defined in the best practice process. Hence, for MVEs supplier change should be tailored to the process.

For quality topics suppliers marked the most findings. This is the opposite to the first research question. Suppliers were more active with the second research question in general. It was probably easier for this group to give comments specific to one process. Problem management is a fairly common ITIL process area and suppliers have practical experience of executing it. Clients were second in recognizing quality related findings.

8.5 Recommendations

In the previous sections the results data of the research analysis has been presented and discussed. In this section the results are further elaborated for three important stakeholder groups in the ITSM landscape. The aim is to give practical recommendations for these groups based on the research findings. A general recommendation for all groups is to go through the distinct findings in Chapter 7 and brainstorm how the findings could be utilized in one's business.

8.5.1 For consuming organizations

The following specific recommendations are given for organizations consuming ITIL based services in MVE:

- Consider all five viewpoints (contractual, financial, functional, process, and quality) when planning future multi-vendor setups or evaluating current multi-vendor setups.

- Apply ITIL best practices gradually, based on business needs.

- Think carefully which KPIs are relevant for the planned services and ensure follow-up and continuous improvement based on them.

- ITIL consultants have a wider understanding of the best practice framework than clients and suppliers, and this expertise should be utilized.

- Reserve a budget for problem management and prioritize root cause removal based on the business case.

8.5.2 For process consultants

The following specific recommendations are given for ITIL process consultants deploying ITIL based services to an MVE:

- Based on the third research question, ITIL consultants had a lot to say about the application of ITIL in general but less when it came to practical experiences of one process area. The recommendation is to set up a feedback loop for the consultants who work with the service initiation to receive updates on how a particular process works in practice.

- In addition to process consulting advice, ITIL best practices should be referred to in the service contracts for MVEs.

- Ensure that in the target MVEs all stakeholders on all levels have the needed knowledge about ITIL and how it is planned to be applied to the service.

- Articulate the benefits and success factors of the problem management process area to the business stakeholders, including the return on investment view.

8.5.3 For providing organizations

The following specific recommendations are given for organizations delivering ITIL based services in MVEs:

- Ensure that all staff participating in delivery understand how the quality of the service is defined, controlled, and improved.

- Promote problem management as part of the service contract from the beginning and utilize ITIL terminology in the agreement.

- Suppliers have more practical delivery experience than clients and process consultants. Ensure that this experience is well articulated and utilized when planning or shaping MVEs.

- Follow that competition between different suppliers does not impact operational co-operation negatively.

8.6 Results compared to the previous literature

The previously known key benefits and critical success factors are presented in Sections 3.7 and 4.3 respectively. In both cases the previous results are general-level abstractions from different in-house or outsourcing situations. To be precise, the previous studies have not had an MVE focus or a focus specific to the problem management process of ITIL.

The new results have a lower abstraction level and give more specific guidance for the MVE. This study presents more individual findings than most of the previous studies. It can also be observed that there is no contradiction between the general results and the MVE specific results.

8.7 Credibility and limitations

The first two research questions have been answered based on the findings from ten professional interviews. The interviewees were selected from three groups: four clients, three process consultants, and three suppliers. The number of interviewees and the inclusion of the mentioned groups support the credibility of the source data. The data analysis process has been fully documented in Chapter 6. By using the data included in the appendixes and the description of the analysis process one could attempt to repeat this study and confirm the results. The study focuses on finding key benefits and critical success factors related to ITIL. The results and discussion focuses on these positive topics while challenges and disadvantages are not in focus.

The third research question depends on the results of the first two research questions. As mentioned in the previous paragraph, the data as a whole is considered sufficiently credible. The third question goes further in the analysis and the answers from different interviewee groups are compared to each other. The number of professional contributors for each

interviewee group is only three or four; this should be considered as a limitation and the results of the third question are not as credible as the results of the first two questions. However, the results of the third question should still be considered credible on the level of giving broad direction.

8.8 Future research

This study has generally dealt with ITIL in an MVE and additionally focused on one process area. From this perspective there are still a number of process areas to be investigated in detail related to their application in multi-vendor situations. Valued process areas could be identified with a pre-study from similar interviewee groups, as in this study.

In recent years, agile philosophy has gained popularity in software development. One impact is that IT services get to have more frequent release cycles for systems. As part of the updates new business processes, enhancements, and integrations can be implemented, for example. It would be interesting to further investigate how agile delivery models impact the ITSM domain and how the transition from development to maintenance should be arranged in an MVE.

As part of this study tooling related question were discussed but did not form a major part of the research. The main finding was that tooling should support an MVE. It would be interesting to further understand the ITSM tooling landscape. Valid subtopics would be, for example, current satisfaction with the tooling, the multi-vendor features of the tooling, the integration capability, and experiences of the tooling.

Further analysis of SLA's impact on service quality and co-operation in an MVE could be studied. There are a growing number of voices saying that setting SLAs is not always a good thing and you get what you measure. The critics say that too strict SLAs kill creativity and are a barrier to seamless co-operation in an MVE.

The ITIL v3 2011 edition books contain an expanded section on problem analysis techniques and examples of applications. Once the 2011 edition gains more popularity and the analysis techniques are widely adopted, the problem domain could be re-evaluated.

Cloud services are one of the hot topics in the IT world currently. Compared to traditional models – where clients have physical servers or at least know where the servers are physically hosted – the cloud service comes with more abstraction. In its basic form the concept covers infrastructure services while IT also expands to managed services. It would be interesting to investigate how enterprises combine the ITSM of their traditional systems with the management of the new cloud-based services. Particularly if the MVE also contains cloud-based managed services then the operating model requires careful consideration.

8.9 Summary

In this chapter the results of all the three research questions were discussed. For the first and second research question the key benefits and key success factors were explained in detail and discussed in context. For the third research question the variations of the division of recognition was discussed. The primary finding was that ITIL consultants dominated the general discussion of the key benefits. On the other hand, suppliers scored highest when one particular process area was discussed.

9. CONCLUSIONS

The research problem of this study was: "How should ITIL be applied in an MVE?" To get a grasp of the problem it was divided into three main research questions. The first question dealt with key benefits of applying ITIL in an MVE. The second question was more specific about what the key success factors are when applying ITIL problem management in an MVE. The third question was about the percentage split of recognition of the previous findings between the relevant stakeholders.

The first and second research questions were fully answered as part of the study. Professional interviews were conducted to get input from three different interviewee groups, which were: service recipient, process consultant, and service provider. The results of the first two questions were categorized under five viewpoints: contractual, financial, functional, process, and quality. For both research questions a total of nineteen different findings were logged under the same viewpoints.

The third research question was answered on general guidance level. This is because of the limitations of the research data. There were only three or four members in each interviewee group and hence making strong group-level generalizations is not feasible.

Based on the above, the goal of the study was met per research question. All three questions were answered and hence a significant contribution was made to understanding the original research problem. There are not many research results from the academic community on ITIL in MVEs. The ones found for the literature review were more case-study oriented. Therefore, these results should be an interesting addition to the academic discussion. Finally, many intriguing opportunities for further research were identified.

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APPENDIX I: DATA SOURCES AND KEYWORDS

Academic papers and university publications

Literature references were collected with the help of Aalto University Library databases. For example, Web of Science (Thomson Reuters), Scopus, ACM (Association of Computing Machinery), AIS Electronic Library (AISeL), IEEE/IEE Electronic Library, and ABI/INFORM (ProQuest) were used. With the article databases the search results were listed in the order of relevance and first twenty hits were explored in more detail for each set of search terms.

The search terms were: ITIL, "information technology infrastructure library", "IT services management", ITIL AND ITSM, ITIL AND multi-vendor, ITIL AND multi-vendor AND "sourcing strategy", ITIL AND multi-sourcing. As an additional filter "computer science" was used to refine the search results to the correct field of science.

Non-academic publications

These publications were harvested from multiple web sources. For example, IT governance related websites, C level blogs, ITSM interest group websites, and internet search engines were used as sources. The search terms were: ITIL, "ITIL history", COBIT, "ISO 20000", multi-sourcing, multi-vendor, ITSM.

APPENDIX II: INTERVIEWS

Professional contributors

The professionals listed in Table 12 have contributed to this research through participating in the semi-structured theme interviews. The order of the professionals in the table does not reflect the order in which the interviews were conducted.

Table 12. Professional contributors

Contributor	Title	Group
Confidential	Service Manager	Client
Confidential	Manager, Business ICT	Client
Confidential	Process Manager (Problem Management)	Client
Confidential	Service Manager	Client
Confidential	Senior Consultant	ITIL Consultant
Confidential	Senior Consultant	ITIL Consultant
Confidential	Senior Consultant	ITIL Consultant
Confidential	ITSM On-Boarding Manager	Provider
Confidential	Service Manager	Provider
Confidential	ITSM Project Manager	Provider

The structure of the interviews

- **Theme: Interviewee and organization**
  - What is the role of the interviewee in the company?
  - In what type of role are IT services in your company?
- **Theme: The purchase models of IT services**
  - What different purchase models of IT services do you recognize and which of these are in use by your organization?
  - Has there been any shift between purchase models in your organization?
  - Is your organization using different purchase models in different situations?
  - What are the key reasons to choose particular a purchase model in the above situations?
- **Theme: Special characteristics of the MVE**
  - What are the benefits of the MVE?
  - What are the challenges of the MVE?
- **Theme: ITSM**
  - What different ITSM frameworks do you recognize?
  - What is your personal experience background with ITIL? (Client / ITIL Consultant / Service Provider)
- **Theme: Special characteristics of the ITIL best practices framework**
  - What are the benefits of ITIL?
  - What are the challenges of ITIL?
  - Which ITIL processes have been taken into use by your organization?
  - Which ITIL processes is your organization planning to take into use next?
- **Theme: ITIL in the MVE**
  - What are the general benefits of ITIL in the MVE?
    - Financial, functional, process, contractual, and quality points of view
    - What other viewpoints do you think should be considered as part of this research?
  - Which of the above benefits are key to your organization?
  - How do you prevent "not my responsibility" type of situations happening in the MVE?
- **Theme: ITIL problem management in the MVE**
  - To which extent you apply the ITIL problem management process in your organization?
  - What do you think about the ITIL problem management process's applicability in the MVE?
  - What things are generally important for working ITIL problem management in the MVE?
    - Financial, functional, process, contractual, and quality points of view
    - What other viewpoints you think should be considered as part of this research?
  - Which of the above things are key in your organization?
  - What type of things prevents ITIL problem management from working in the MVE?
- **Theme: ITSM tools**
  - What tools does your company use to organize ITSM?
  - Do you feel that the current tools are suitable for the MVE?
  - What benefits and challenges do you see in service recipient's central ITSM tool versus SPs' own ITSM tools?
  - What type of experience you have of integrating the ITSM tools of multiple organizations?

Is there something else on your mind that has not yet been discussed but you think should be considered as part of this ITSM research?