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SIAM Dashboard for an Industrial Manufacturing Company

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This thesis focuses on proposing a SIAM dashboard for an industrial manufacturing company. The case company utilizes SIAM (Service Integration and Management) for managing their company's IT services and vendors, but at the start of this thesis there was no real-time information easily available for the managers working at the SMO (Service Management Office) regarding the IT service and core process performance. There were also no standardized KPIs for measuring IT service and core process performance.

This thesis was conducted as a case study, with data collected from the case company experts working within the SMO (SIAM function). The data used in this study is based on confidential case company interviews (3), case company workshop (1), and validation provided by the case company experts working within the SMO.

This thesis proposed a SIAM Dashboard for the case company, which was built based on a comprehensive collection of available knowledge and best practice gathered from trusted sources (ITIL® 2011, IT Service Management Forum).

As a result, the SIAM KPIs were standardized to be used within the case company. In addition, the SIAM Dashboard proposed in this thesis was implemented in the case company ITSM tool and now provides real-time information for the managers working within the SMO regarding IT service and core process performance.

Keywords	SIAM, ITIL, KPI, Dashboard, SMO

Metropolia

Contents

Metropolia

List of Figures

List of abbreviations

CI	Configuration Item. A component of an infrastructure that currently is, or soon will be under configuration management.
CMDB	Configuration Management Database. A repository that acts as a data warehouse for information technology (IT) installations.
ITIL	Information Technology Infrastructure Library. A set of detailed IT Service Management practices that focuses on aligning IT services with the needs of business.
ITSM	Information Technology Service Management. A collection of processes, procedures and policies that are performed by an organization in order to be able plan, design, deliver, operate and control IT (Information Technology) services offered to customers.
KEDB	Known Error Database. Created by Problem Management and used by Incident and Problem Management to manage all Known Error Records.
KPI	Key Performance Indicator. A type of performance measurement, which indicates how an organization is performing in a certain activity which it engages in.
OLA	Operational Level Agreement. Defines the interdependent relationships in support of a service-level agreement (SLA).
SIAM	Service Integration and Management. A management approach and practice for managing multiple suppliers of services and integrating them to provide a single business-facing IT organization.
SLA	Service Level Agreement. A commitment between a service provider and a client regarding aspects of the service, such as quality, availability, responsibilities etc.
SMO	Service Management Office. A SIAM best practice function. Includes people and tools for running SIAM inside an organization.

1 Introduction

This thesis focuses on producing an optimal SIAM (Service Integration and Management) Dashboard for a case company. The purpose of SIAM Dashboard is to be used for real-time performance monitoring of the case company's IT services and core process performance.

In this thesis, a SIAM Dashboard was developed by analyzing multiple case company interviews, available knowledge, and by collecting data and knowledge about the case company's current SMO practices, and SIAM Dashboard and KPI requirements. The target of the project was to develop a SIAM Dashboard for the case company, which could be implemented and used in the case company's Service Management Office (SIAM function). The SIAM Dashboard would be used by the head of SMO and the service managers of the case company for measuring and monitoring IT service and core process performance. The SIAM Dashboard offers a starting point for the case company to start measuring their IT service and core process performance in a standardized way.

1.1 Business Context

The case company is an internationally operating large-sized industrial manufacturing company. The organization has production facilities on all continents and delivers its products for global markets. The general key focus areas for industrial manufacturing companies, such as the case company, are operative efficiency and cost management, product and production development, technology and innovation management, regulation and traceability compliance, and environmental concerns and considerations.

IT (Information Technology) has taken big leaps and is still constantly developing at a rapid pace. In the past few years the role of IT in the case company has changed significantly compared to what it used to be. In the early days, IT was considered as a support function and it was mostly separated from the business itself. The role of IT had traditionally been to provide and maintain the necessary IT capabilities for the case company's use, and previously it was not considered as one of the most crucial parts which was required for running a successful business. Now, the IT's role is to bring value by working alongside the business towards the same goals as an enabler, instead of being

a supporting function. This development has changed how the IT services and the core processes are deployed, operated and measured within the case company's ITSM.

1.2 Business Challenge, Objective and Outcome

The business challenge regarding this thesis is that the case company utilizes SIAM (Service Integration and Management) for managing their company's IT services and vendors, but there is no real-time information easily available for the managers working at the SMO (Service Management Office) regarding the IT service and core process performance. The SMO consists of service managers and their supervisor, the head of SMO. The goal of the SMO is to execute SIAM best practice using the right tools and expertise. Each service manager is responsible for a group of IT services in the company, and they report the status to their supervisor on a weekly basis. The data is available in the ITSM tool, but it has to be gathered manually by the service managers. This action has to be performed regularly in order to keep the information up-to-date, which consumes a considerable amount of time from the service managers. Because the time is limited, the service managers do not have time to focus on all relevant KPIs (Key Performance Indicators) regarding SIAM, which indicate the IT service and core process performance. There is no standardized way for choosing or analyzing KPIs. The service managers choose their own KPIs for their services.

Accordingly, the objective of this thesis is to *define a SIAM Dashboard for the case company, that increases the ability to deal with the challenges the case company is currently facing without a real-time SIAM monitoring system.* This includes defining and standardizing the SIAM KPIs to be used by the case company's head of SMO and the service managers in the SMO. The SIAM Dashboard is for measuring the IT service and core process performance which are managed by SMO (SIAM function).

The outcome of this thesis is a SIAM Dashboard and KPIs that can be used by the case company's head of SMO and service managers for measuring and evaluating the IT service and core process performance which are related to SIAM. This is carried out by using available knowledge and gathering information from the leading experts inside the case company. The SIAM Dashboard will be implemented into the ITSM tool utilized by the case company.

1.3 Thesis Outline

The scope of this thesis is limited to defining the SIAM Dashboard and choosing the optimal KPIs for the SIAM Dashboard used by the case company based on existing information. This thesis does not focus on the technical aspects of implementing the SIAM Dashboard into the ITSM tool. This thesis does not focus on improving the case company's SIAM practices or SIAM as a concept in general.

This study was conducted by: (1) Performing a current state analysis on the case company SMO practices. (2) Gathering and analyzing available literature regarding ITIL and SIAM Dashboards. (3) Holding a workshop with the case company experts. The purpose of the workshop was to analyze the current state analysis and the available knowledge together with the case company experts and define the SIAM Dashboard and KPI requirements for the case company based on this information. (4) Building a SIAM Dashboard pilot based on the current state analysis, available knowledge, and information received from the workshop. (5) Validating the proposal with the case company experts.

This thesis is written in 7 sections. Section 1 is the introduction. Section 2 discusses the method and the material used for conducting this thesis. Section 3 is the current state analysis. Section 4 overviews the available knowledge and best practice. Section 5 presents the building of the proposal. Section 6 reveals the results of the proposal validation. Finally, section 7 includes the summary and evaluation of the result.

2 Method and Material

This chapter describes the research design, thesis plan, and data collection and analysis. Each sub-chapter includes a figure or a table that illustrates the contents.

2.1 Research Design

This thesis is conducted in five different steps, and the steps pictured in the research design diagram below. The steps will be elaborated in more detail after Figure 1.

Figure 1. Research design of this thesis

As shown in the *Figure 1* above, this study starts with describing the objective for the thesis. The objective for this thesis is *to define SIAM Dashboard and KPIs for an industrial manufacturing company that can increase the ability to deal with the challenges the case company is currently facing without a real-time SIAM monitoring system based on current information. The SIAM Dashboard measures the performance of vendors, IT services and core process performance which are managed by SMO (SIAM function).*

In the next step, after the objective is defined the thesis examines the current state of the case company regarding on what kind of challenges the case company is currently facing regarding measuring IT service and core process performance. This is done by interviewing the case company on current SMO practices, and it focuses on analyzing the strengths and weaknesses of the current practices. The outcome of this step is an overview of the case company's current state regarding measuring IT service and core process performance, and topics to be scrutinized in the literature review.

In the next step, the literature and available knowledge is investigated, focusing on building knowledge regarding ITIL KPI best practice, and a SIAM Dashboards example. The goal of this step is to gather knowledge that can be applied to defining the SIAM Dashboard and KPIs for the case company in this thesis. The outcome of this stage is to obtain the knowledge required for building the proposal stage.

In the next step, the case company workshop is initiated and the work for building the proposal starts. The current state of the SMO is discussed, and the available knowledge is analyzed together with the case company experts in order to define the SIAM Dashboard and KPI requirements for the case company. The goal of this step is to identify the key requirements for the SIAM Dashboard and KPIs based on the material discussed, and to define the optimal SIAM Dashboard and KPIs for the case company based on this information. The outcome of this stage is a pilot version of the SIAM Dashboard and KPIs, which will be released in the case company's production environment.

In the final step, the defined SIAM Dashboard and KPIs will be validated by the case company. Feedback and improvement points will be gathered from the case company regarding the SIAM Dashboard and KPIs. The goal of this step is to make the final adjustments to the SIAM Dashboard and KPIs based on the feedback received, so that the SIAM Dashboard and KPIs correspond to the case company's needs. The outcome of this step is the final version of the SIAM Dashboard and KPIs, which will be running in the case company's production environment.

2.2 Thesis Plan

This thesis will follow a schedule plan described in Figure 2 below. The first phase (Week 1) concentrates on building an understanding about the thesis goals. This includes defining the business challenge, objective and outcome. The second phase (Week 2) focuses on building the research design, thesis plan, data collection and analysis. The third phase (Week 3) focuses on building the current state analysis. The fourth phase (Weeks 4-5) concentrates on gathering the available knowledge and best practice. The fifth phase (Weeks 6-8) focuses on building the proposal. The sixth and final phase (Week 9) concentrates on validating the proposal and presenting the final version.

Week 1	Gate 1 – Business challenge, objective and outcome
Week 2	Gate 2 – Research design, thesis plan, data collection and analysis
Week 3	Gate 3 – Current state analysis
Week 4	Gate 4 – Available knowledge and best practice (conceptual framework)
Week 5	
Week 6	Gate 5 – Building the proposal
Week 7	
Week 8	
Week 9	Gate 6 – Validating the proposal
	Gate 7 – Final version

Figure 2. Thesis schedule

This thesis is a real-life business project commissioned by the case company and based on a variety of information inputs and analysis of multiple data sources. The data sources and data analysis are described in detail in the next chapter.

2.3 Data Collection and Analysis

The data was gathered in three points that included three different case company interviews and a case company workshop. The data for the thesis are shown in Figure 3 below.

	Participants / role	Data type	Topic, description	Date, length	Documented as
	Data 1, for the Current State Analysis (Section 3)				
1	Interview 1: Head of SMO	Face-to-face interview	Current state of the case company regarding measuring IT service and core process performance	Feb 14, 2018 1.5 hours	Field notes
2	Interview 2: Service Managers	Face-to-face interview	Current state of the case company regarding measuring IT service and core process performance	Feb 15, 2018 1.5 hours	Field notes
	Data 2, for the Proposal building (Section 5)				
3	Workshop 1: Head of SMO, Service Managers	Face-to-face interview	Current state analysis, ITIL KPI best practice, SIAM Dashboards example, case company SIAM Dashboard and KPI requirements	March 7, 2018 3 hours	Field notes
	Data 3, from Validation (Section 6)				
4	Interview 3: Head of SMO, Service Managers	Face-to-face interview	Validation, evaluation of the Proposal	March 28, 2018 1 hour	Field notes

Figure 3. Details of the data used in the current state analysis (Data 1), proposal building (Data 2), and validation (Data 3)

As seen in Figure 3 above, the data was collected in three (3) different rounds. In the first round (Data 1), the current state of the case company regarding measuring IT service and core process performance was discussed with the Head of SMO and the Service Managers in the case company interviews.

In the next round (Data 2), the current state analysis was discussed, and the available knowledge regarding ITIL KPI best practice and SIAM Dashboards example were analyzed together with the Head of SMO and the Service Managers in the case company workshop. The case company SIAM Dashboard and KPI requirements were defined based on this analysis.

In the last round (Data 3), the proposal was validated together with the Head of SMO and the Service Managers in the case company interview.

3 Current State Analysis of the SMO practices

This section overviews the current state of SMO and the current IT service and core process performance measuring practices. The current state analysis is based on case company interviews conducted with the head of SMO and the service managers.

3.1 Overview of CSA Stage

The current state analysis was conducted in two steps. First, information about the SMO practices was collected from the case company in order to build understanding of the current state of SIAM performance measuring. After that, the focus was on analyzing the strengths and weaknesses of the current SMO practices and KPIs. This analysis was done by interviewing the service managers and the head of SMO from the SMO function and discussing the IT service and core process performance measuring practices. The analysis also included researching of internal documents provided by the case company.

3.2 Background of the SMO

The input for the existence of SMO comes from the case company's strategy. The case company focuses on increasing the creation of value covering all areas of the organization, including IT. The organization has outsourced most of the IT in the recent years. By choosing to utilize IT services from trusted vendors, the case company is able to focus their development and expertise on the industrial manufacturing area, which is the organization's key business area.

According to the case company's internal documents, the SMO ensures the SIAM compliance which means managing the multi-supplier environment according to the SIAM best practice. The SMO is responsible for five different service areas: Service desk, application services, end user services, network services, and infrastructure services. In the Figure 4 below, you can see the high-level structure of the case company IT.

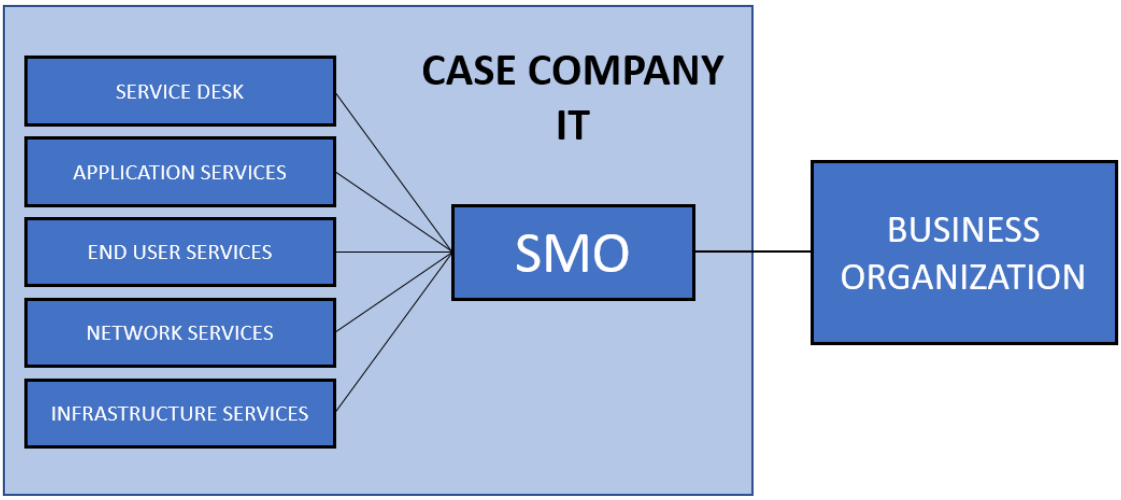

Figure 4. SIAM service areas managed by SMO

The SMO (SIAM function) consists of SIAM practices, people, and ITSM tool. The target of the SMO is to steer and develop service processes, ensure the quality of service operations, and guide and monitor the service providers. The SMO is directly connected to the business organization, where the business functions are located, and the input for the SMO comes straight from the business organization.

3.3 Current SMO practices

According to the interview with the head of SMO, it is the SMO's responsibility to provide the practices, people, and tools required for managing the services and vendors according to the SIAM best practice. The SMO currently consists of a group of service managers and their supervisor, the head of SMO. The main focus for the service managers is to ensure the availability of services for the use of the organization. Each of the service manager has their own service area they are responsible for, which can consist of different types of services provided by multiple vendors.

Based on the interview with the head of SMO, the service managers report the status of their service area to the head of SMO on a weekly basis, or more frequently if the situation requires so. These situations arise when there is an exceptionally high number of incidents, problems and changes at the same time. These situations can also arise if the level of difficulty within the incidents, problems and changes is very challenging. The head of SMO's responsibility is to escalate the issues when required in order to get the

resources for solving a critical state. This is important in situations when a root-cause for a problem has not been identified, and there is a risk for the problem to cause more harm in the SIAM ecosystem if not solved properly.

One of the service managers explained in the case company interview that the reporting is done as follows, the service managers manually gather data regarding the key performance indicators from the ITSM tool (e.g. active major incidents, number of open incidents, active problems by status etc.), the service managers then analyze the data and compose the information into a file-form that can be easily reviewed (e.g. MS Excel, Powerpoint). The material is then reviewed together with the head of SMO, the information is compared with the historical data, and the required actions based on the information are then defined together. The main target is to maintain an overall service level within the SMO, which is effective in terms of cost and functionality.

The service managers were currently creating reports based on data received from the following ITIL processes within the SMO: Incident management, request fulfilment, configuration management, and change management.

3.4 Strengths of the current SMO practices

The head of SMO stated in the interview that the roles inside the SMO are clear at the moment. The SMO consists of a group of service managers and the head of SMO is their supervisor. Each service manager has a clearly defined service area which they are responsible for. When service managers hold the responsibility over same certain specific vendors and services, deep knowledge and experience regarding these is able to be generated. Based on this knowledge and experience, the service managers are able to do better day-to-day decisions and deal better with unexpected situations.

According to the case company interviews, the head of SMO leads the SIAM function and is responsible for the overall service level. In case of problems, the service managers share the information with the head of SMO, who then escalates the issue, so that the problem can solved as soon as possible. The head of SMO’s responsibility is to give the support to the service managers that they require in order to be as effective as possible.

3.5 Weaknesses of the current SMO practices

One of the service managers described in an interview that each of the service managers has their own service areas, and each of the service managers are able to choose their own KPIs to follow. There is no standardized collection of KPIs for all service managers, just some general guidelines that can be adapted. Each of the service managers has their own approach on their chosen KPIs, depending on which success factors they rely on with different services and processes. According to the head of SMO, this means that because the service managers have a limited amount of time for gathering the KPI data from the ITSM tool, they might not be aware of all important aspects regarding their service area. It can also be challenging to compare the overall performance between different service areas, if the chosen KPIs are not consistent. Also, because the service managers gather the KPI data from the ITSM tool in certain intervals, they might not be accurate anymore at the time they present the information for the head of SMO.

Based on the case company interviews, as each service manager is responsible and focused on their own service area, they are not fully aware of the status of the services and vendors as a whole. According to the head of SMO, miscommunications between service managers can lead to a situation where challenges in one of the service manager's service area start affecting another service manager's services and vendors. This means that finding the root-cause can be more difficult and time-consuming from the service managers' perspective.

The head of SMO stated in one of the interviews that the service managers require a lot of time for gathering the key data from the ITSM tool, which is the status of incident management, change management, problem management and other core process areas, because it is being done manually. This means that a significant part of service managers' time is used for something that could be potentially automated, and this time is taken away from using it in higher priority tasks.

3.6 Summary

The summary of the current state analysis is as follows. According to the case company's internal documents, the SMO's main objective is to serve the business organization by effectively managing the multi-supplier environment according to SIAM best practice. This includes managing the performance of services and vendors within the ITSM. The SMO manages the case company's IT services: Service desk, application services, end user services, network services, and infrastructure services. Based on the interviews with the head of SMO and the service managers, the SMO consists of group of service managers and their supervisor, the head of SMO. Each service manager has their own service area they are responsible for, and each service manager reports their service area's performance to the head of SMO on a weekly basis. The head of SMO is responsible for the overall performance of the SMO. In cases of challenges occurring in the service areas, the head of SMO is responsible for escalating the issues, so that the challenges can be addressed properly in order the problems to be solved.

Based on the case company interviews, the strength of the current SMO practices are that the roles and responsibilities are clearly defined. The main challenge is that the service managers choose their own KPIs for measuring their IT services and core process performance. The KPIs are not standardized because each service manager has their own view on the success factors regarding their IT services and core processes. This means that because different indicators for success are used, there is no common understanding regarding the IT service and core process success factors between the service managers. This means that the service managers might not be fully aware of the status of the SMO's IT service and process performance outside their own service area, and this can make finding root-causes harder in situations where challenges from other parts of the SMO start affecting service manager's own service area.

When the service managers are using different KPIs, this can also make comparing the overall performance between different service areas more challenging for the head of SMO. Another challenge the service managers face at the moment, is that they have to gather the data manually from the ITSM tool. There is currently no real-time information easily available for the service managers regarding the performance of IT services and core processes.

In the Figure 5 below is a summary table of the weaknesses and literature relevant regarding the weaknesses:

Weaknesses	Relevant literature
No unified, consistent or standardized KPIs for measuring the IT service and core process performance. No common understanding about the IT service and core process success factors. No real-time information regarding IT service and core process performance.	• ITIL metrics and KPIs • ITIL critical success factors • SIAM Dashboards

Figure 5. Summary of weaknesses and the relevant literature

As described in the figure above, one of the first weaknesses discovered regarding the current SMO practices was that there were no standardized KPIs for measuring the IT service and core process performance used by the service managers. The processes which were currently monitored by the service managers within the SMO consisted of the following ITIL processes: Incident management, request fulfilment, configuration management, and change management. For this reason, in order to obtain the information required for standardizing the KPIs used in the SMO, the focus in researching the relevant literature regarding this would be on ITIL metrics and KPIs. Because the nature of the service managers' daily work is highly operational and the ITIL processes currently monitored are a part of the ITIL Service Operation lifecycle, this part of ITIL will be highly focused on in the next chapter. The goal would be to gather the metrics and KPIs which are most commonly used within ITIL and recognize the most important KPIs in terms of measuring IT service and core process performance, which could be used for standardizing the KPIs within the SMO. These KPIs would also be used in the building of the case company SIAM Dashboard proposal.

Another weakness revealed in the current state analysis was that there was no common understanding about the success factors related to IT service and core process performance. For this reason, in order to be able to create a common understanding regarding the critical success factors of the IT services and (ITIL) core processes, the focus in studying the relevant literature regarding this would be on ITIL critical success factors.

The goal would be to understand that what are the common critical success factors recognizes within ITIL and apply this information in creating a common understanding within the SMO regarding the IT service and core process success factors. These critical success factors would also be used in the building of the case company SIAM Dashboard proposal.

One of the weaknesses which was also identified was that the SMO currently had no real-time information available regarding IT service and core process performance. This was also one of the first reasons when a need for a SIAM Dashboard was initially recognized. For this reason, in order to be able to define the optimal SIAM Dashboard for the case company, it would be logical to analyze examples of the SIAM Dashboards that have been built so far. The goal would be to gather knowledge regarding the current SIAM Dashboard best practice. This knowledge would also be used in the building of the case company SIAM Dashboard proposal.

4 Available Knowledge and Best Practice on ITIL processes and SIAM Dashboards

This chapter discusses the available knowledge and best practice on ITIL KPIs, and SIAM Dashboards. The first part of this chapter focuses on the ITIL Service Operation processes. This is relevant for the SMO (SIAM function) as it is built on top of ITIL processes. This part focuses on understanding the critical success factors and metrics which are generally used within the chosen ITIL processes. The second part shows an example of a SIAM Dashboard, which was built based on the best practice of six different companies. This part focuses on the KPIs utilized in this SIAM Dashboard example and the reasons behind them.

4.1 ITIL Service Operation processes

The Service Operation in terms of ITIL best practice is highly focused on managing day-to-day activities and the enabling technology. As a part of the service management lifecycle, the Service Operation is responsible of the execution and performance of the processes that optimize the cost and quality of services. As part of the organization, the Service Operation is responsible for enabling the business to achieve its objectives. As

part of the world of technology, the Service Operation is responsible for the efficient functioning of the components that support the services. All of the functions, processes and activities in the Service Operation have been designed in a way, so that they can deliver a specified and agreed level of services, which can be delivered in an ever-changing environment. The different processes of Service Operation will be described in detail in the chapters below. (Cannon, D. 2011)

The main focus in the chapters below is in understanding the critical success factors related to each process, and the metrics related to each process which define the status and success of the process itself.

4.1.1 Event management

Event management is a process which monitors all of the events that occur inside the IT Infrastructure. The main focus is to enable active operation and to detect and escalate abnormal conditions. Any detectable or discernible occurrence can be described as an event when it has significance for the management of the IT infrastructure or the delivery of IT service and evaluation of the impact an inconsistency might cause to the services. Events are generally notifications that are created by an IT service, a configuration item (CI) or a monitoring tool. (Cannon, D. 2011)

The purpose of the event management process is to provide the ability to detect events, make sense of them and determine the appropriate control over them. The event management is the foundation for operational monitoring and control in the Service Operation. Event management serves as the entry point for the execution of multiple Service Operation processes and activities. It provides the means for comparing actual performance against the design standards and SLAs. (Cannon, D. 2011)

Achieving the correct level of filtering is one of the most important critical success factors in terms of event management. This is often very complicated because the significance of the events changes. There are three keys to the correct level of filtering, which are: Integrate the event management into all service management processes where possible (this ensures that only the events which are significant to these processes are reported), design the new services with the event management process in mind, and lastly, trial and error (there will always be classes of events that are not properly filtered, so it is not possible to fully prepare for everything). (Cannon, D. 2011)

The metrics for checking the effectiveness and efficiency in terms of the event management process are shown in the Figure 6 below.

Event management metrics according to ITIL®
Number of events by category.
Number of events by significance.
Number and percentage of events that required human intervention and whether this was performed.
Number and percentage of events that resulted in incidents or changes.
Number and percentage of events caused by existing problems or Known Errors. This may result in a change to the priority of work on that problem or Known Error.
Number and percentage of repeated or duplicated events. This will help in the tuning of the Correlation Engine to eliminate unnecessary event generation and can also be used to assist in the design of better event generation functionality in new services.
Number and percentage of events indicating performance issues (for example, growth in the number of times an application exceeded its transaction thresholds over the past six months).
Number and percentage of events indicating potential availability issues (e.g. failovers to alternative devices, or excessive workload swapping).
Number and percentage of each type of event per platform or application.
Number and ratio of events compared with the number of incidents.

Figure 6. Event management metrics according to ITIL (Cannon, D. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the quantity of events which is divided based on the type (category, significance etc.).

4.1.2 Incident management

According to ITIL terminology, an incident is defined as following: *"An unplanned interruption to an IT service or reduction in the quality of an IT service. Failure of a configuration item that has not yet impacted service is also an incident, for example failure of one disk from a mirror set."* (Cannon, D. 2011) Incident management process is for managing with all incidents, consisting of failures, questions and queries reported by users (usually to the Service Desk), technical staff, or automatically identified and reported by event monitoring tools. For major incidents, there is a separate procedure used which

has shorter timescales and greater urgency. It must be agreed on what constitutes as a major incident and it has to be ideally mapped on to the overall incident prioritization system, so that they can be properly managed through the major incident process. (Cannon, D. 2011)

The purpose of the incident management process is to restore normal service operation as quickly as possible and minimize the harmful effect on the business operations. Also, to ensure that the best possible levels of service quality and availability are maintained. Because the incident management process is highly visible to the business, its value is easier to demonstrate compared to most areas in Service Operation. This is also the reason that incident management is often among the first processes to be implemented in service management projects. (Cannon, D. 2011)

There are a few critical success factors for successful incident management process. First of all, a key to a successful incident management is a good service desk. Secondly, clearly defined targets to work with defined in the SLAs. Thirdly, an adequate customer-oriented and technically trained support staff with the right skills at all stages of the process. Fourthly, integrated support tools to drive and manage the process. And lastly, OLAs and UCs that are capable of influencing and shaping the right behavior of all support staff.

The metrics for checking the effectiveness and efficiency in terms of the incident management process are shown in the Figure 7 below.

Incident management metrics according to ITIL®
Total numbers of Incidents (as a control measure).
Breakdown of incidents at each stage (e.g. logged, work in progress, closed etc.).
Size of current incident backlog.
Number and percentage of major incidents.
Mean elapsed time to achieve incident resolution or circumvention, broken down by impact code.
Percentage of incidents handled within agreed response time (incident response-time targets may be specified in SLAs, for example, by impact and urgency codes).
Average cost per incident.
Number of incidents reopened and as a percentage of the total.
Number and percentage of incidents incorrectly assigned.
Number and percentage of incidents incorrectly categorized.
Percentage of Incidents closed by the Service Desk without reference to other levels of support (often referred to as 'first point of contact').
Number and percentage the of incidents processed per Service Desk agent.
Number and percentage of incidents resolved remotely, without the need for a visit.
Number of incidents handled by each Incident Model.
Breakdown of incidents by time of day, to help pinpoint peaks and ensure matching of resources.

Figure 7. Incident management metrics according to ITIL (Cannon, D. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the quantity of incidents and the percentage of different incidents according to status. Other aspects are included in the metrics as well, such as cost, handling, resolving etc.

4.1.3 Request fulfilment

Service request is a term which is used as a universal description for many different types of demands that are guided to the IT department by the users. Many of the service requests are small changes which are low cost, low risk, frequently occurring, and so on. This can be something like a request to install a software onto a certain workstation or a request for a new password. Because of the scale and frequent, low-risk aspects, the

service requests are better managed by a separate process, instead of burdening the incident and change management processes. (Cannon, D. 2011)

The purpose of the request fulfilment process is to manage the service requests received from the users. The request fulfilment process has following objectives: Firstly, providing a channel that users can utilize to request and receive basic services, including a predefined approval and qualification process. Secondly, providing the information to the users and customers regarding availability of services and the procedure for receiving them. Thirdly, sourcing and delivering the components of the requested basic services. And lastly, assisting with basic information, complaints or comments. (Cannon, D. 2011)

There are a few critical success factors that the request fulfilment process depends on. Firstly, that there is a mutual understanding of what services are going to be standardized and who is authorized to request them. It is important that the costs regarding the services are agreed on, and any variances in terms of services are defined. Secondly, that the publication of services would be done to the users as a part of the service catalogue (ITIL Service Design) where the services can be easily accessed. Thirdly, that there is a standard fulfilment procedure defined for each of the service which are being requested, including every procurement policy and the ability to set up purchase orders and work orders. Fourthly, that there is a single point of contact used for requesting services. This is usually provided by the Service Desk or Intranet but can be automated directly to the request fulfilment or procurement system as well. Finally, that there are the self-service tools which are required to provide a front-end interface to the users. It is important that these also integrate fully with the back-end fulfilment tools, which are generally managed through incident management or change management. (Cannon, D. 2011)

The metrics for judging the effectiveness and efficiency in terms of the request fulfilment process are shown in the Figure 8 below.

Request fulfilment metrics according to ITIL®
The total number of Service Requests (as a control measure).
Breakdown of service requests at each stage (e.g. logged, WIP, closed, etc.).
The size of current backlog of outstanding Service Requests.
The mean elapsed time for handling each type of Service Request.
The number and percentage of Service Requests completed within agreed target times.
The average cost per type of Service Request.
Level of client satisfaction with the handling of Service Requests (as measured in some form of satisfaction survey).

Figure 8. Request fulfilment metrics according to ITIL (Cannon, D. 2011)

As shown in the figure above, the main focus in the metrics breaks down in the quantity, type, and effect of service requests.

4.1.4 Problem management

According to ITIL, a problem is defined as a cause of one or more incidents. The problem management process has the responsibility of controlling the lifecycle of all problems. The main focus for the problem management is to prevent problems and incidents, minimize the impact of incidents that cannot be prevented and remove recurring incidents. (Cannon, D. 2011)

Together with change management and incident management, problem management works to ensure that the IT service availability and quality are increased. In case of incidents are being resolved, the information regarding the resolution is recorded. This information can be used later for speeding up the resolution time of incidents. As a result, this benefits in less downtime and less disruption caused by incidents to the business critical systems. The problem management process creates value by increasing the availability of IT services and the productivity of IT and business staff and decreasing the expenditure on workarounds that do not work, as well as the cost of effort assigned in fire-fighting and resolving repetitive incidents. (Cannon, D. 2011)

The problem management is highly dependent on the establishment of a well-functioning incident management process and tools. Effective incident management process ensures that problems can be identified and worked on as much as possible in the pre-qualification stage. The critical success factors in terms of the problem management process are highly connected to the incident management. Firstly, that there is an effective linking between the incident and problem management tools. Secondly, that there is an ability to relate problem and incident records. Thirdly, that there is a good working relationship between the first-line, second-line, and third-line staff. And finally, that it is a good understanding of the business impact by all of the staff working with the problem resolution. (Cannon, D. 2011)

The metrics for judging the effectiveness and efficiency in terms of the problem management process are shown in the Figure 9 below.

Problem management metrics according to ITIL®
The total number of problems recorded in the period (as a control measure).
The percentage of problems resolved within SLA targets (and the percentage that are not).
The number and percentage of problems that exceeded their target resolution times.
The backlog of outstanding problems and the trend (static, reducing or increasing).
The average cost of handling a problem.
The number of major problems (opened and closed and backlog).
The percentage of Major Problem Reviews successfully performed.
The number of Known Errors added to the KEDB.
The percentage accuracy of the KEDB (from audits of the database).
The percentage of Major Problem Reviews completed successfully and on time.

Figure 9. Problem management metrics according to ITIL (Cannon, D. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the quantity, percentage, cost and effect of different problems.

4.1.5 Access management

Access management process is responsible of granting the right for users to use services and preventing access from users that are non-authorized. Access management provides the rights to different services to different users based on the policies and actions that are defined in security management and availability management ITIL processes. (Cannon, D. 2011)

Access management process creates value in following ways: It provides controlled access to services from users and this enables the organization to maintain the confidentiality of its information more efficiently. It provides a right level of access for the employees to execute their duties. It decreases the probability of an unexperienced user making errors using a critical service. It provides a capability for auditing the use and abuse of services and to more easily deny access when necessary. And finally, it may be required for regulatory compliance, for example with SOX, HIPAA, and COBIT. (Cannon, D. 2011)

In order to be successful, the access management would consist of multiple technical capabilities, for example: Having the ability to identify a user reliably, as well as the approver. Having the ability to identify if the user qualifies to be authorized for certain actions and having the ability to link multiple access rights to a certain user type. To summarize, the success of the access management is highly dependent on a system that is able to perform the actions that are required in order to give the right authorizations to the right users, while protecting the organization's business critical information and functions. (Cannon, D. 2011)

The metrics for judging the effectiveness and efficiency in terms of the access management process are shown in the Figure 10 below.

Access management metrics according to ITIL®
Number of requests for access (Service Request, RFC, etc.).
Instances of access granted, by service, user, department, etc.
Instances of access granted by department or individual granting rights.
Number of incidents requiring a reset of access rights.
Number of incidents caused by incorrect access settings.

Figure 10. Access management metrics according to ITIL (Cannon, D. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the quantity of requests and accesses, as well as the incidents related to them.

4.1.6 Other ITIL processes related

There are also other processes in ITIL which are related to the ITIL Service Operation processes, but they are covered in the other lifecycle phases. The other ITIL lifecycle phases are: Service Strategy, Service Design, Service Transition, and Continual Service Improvement.

As well as in the Service Operation processes, the main focus in the chapters below is in understanding the critical success factors related to each process, and the metrics related to each process, which define the status and success of the process itself.

4.1.6.1 Change management

The purpose of the change management process is to enable beneficial changes to be made and control the lifecycle of all changes. In an organization, changes are performed for different reasons, and they can be proactive (changes initiated from search of business benefits, e.g. reduce of costs, improvement of services, increase of effectiveness etc.) and reactive (resolving problems and adapting to the change) by nature. The change management process is a part of the ITIL Service Transition. (Lacy, S. 2011)

The change management process has to ensure that the objects being measured have a certain meaning. For example, it can be easy to count the number of incidents which are going to create changes, but it is much more important to understand the underlying causes of these changes, and to identify the trends. If not controlled properly, changes can have a negative impact on the business. (Lacy, S. 2011)

The metrics for judging the effectiveness and efficiency in terms of the change management process are shown in the Figure 11 below.

Change management metrics according to ITIL®
The number of changes implemented to services which met the customer's agreed requirements, e.g. quality/cost/time (expressed as a percentage of all changes).
The benefits of change expressed as 'value of improvements made' + 'negative impacts prevented or terminated' compared with the costs of the change process.
Reduction in the number of disruptions to services, defects and re-work caused by inaccurate specification, poor or incomplete impact assessment.
Reduction in the number of unauthorized changes.
Reduction in the backlog of change requests.
Reduction in the number and percentage of unplanned changes and emergency fixes.
Change success rate (percentage of changes deemed successful at review/number of RFCs approved).
Reduction in the number of changes where remediation is invoked.
Reduction in the number of failed changes.
Average time to implement based on urgency/priority/change type.
Incidents attributable to changes.
Percentage accuracy in change estimate.

Figure 11. Change management metrics according to ITIL (Lacy, S. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the quantity and the type of different changes, as well as understanding the successfulness of changes and the root-causes behind that.

4.1.6.2 Service asset and configuration management

The service asset and configuration management process is responsible for effectively managing organization's assets and configurations that enables efficient running of the business. The purpose of the service asset and configuration management consists of following objects: Firstly, to identify, manage, report, audit and verify different service assets and configuration items (CIs). And secondly, to account for, manage and secure the integrity of different service assets and configuration items throughout the service lifecycle, so that only authorized components are utilized, and authorized changes are

being made. The service asset and configuration management is a part of the ITIL Service Transition. (Lacy, S. 2011)

The goals of the configuration management consist of following objects: Firstly, supporting the business and the customer with controlling the objectives and requirements. Secondly, providing accurate and up-to-date configuration information to enable optimal decision making. Thirdly, decreasing the quality and compliance issues caused by false configuration of assets and services. And finally, optimizing the service assets, configurations, capabilities and resources utilized by the organization. (Lacy, S. 2011)

The metrics for judging the effectiveness and efficiency in terms of the service asset and configuration management process are shown in the Figure 12 below.

Service asset and configuration management metrics according to ITIL®
Percentage improvement in maintenance scheduling over the life of an asset (not too much, not too late).
Degree of alignment between provided maintenance and business support.
Assets identified as the cause of service failures.
Improved speed for incident management to identify faulty CIs and restore service.
Impact of incidents and errors affecting particular CI types, e.g. from particular suppliers or development groups, for use in improving the IT services.
Percentage re-use and redistribution of under-utilized resources and assets.
Degree of alignment of insurance premiums with business needs.
Ratio of used licences against paid for licences (should be close to 100%).
Average cost per user for licences (i.e. more effective charging options achieved).
Achieved accuracy in budgets and charges for the assets utilized by each customer or business unit.
Percentage reduction in business impact of outages and incidents caused by poor service asset and configuration management.
Improved audit compliance.

Figure 12. Service asset and configuration management metrics according to ITIL (Lacy, S. 2011)

As shown in the figure above, the main focus in the metrics is in optimizing the cost and performance of the service assets and configurations.

4.1.6.3 Release and deployment management

The release and deployment management process is responsible of the planning, scheduling and controlling the movement of releases to test and production environments. The primary target for the release and deployment management is securing the integrity of the production environment and ensuring that the correct components are released. This includes objectives such as the following: Defining and agreeing the release and deployment plans together with the stakeholders and customers, ensuring each release package is composed using assets and service components that are compatible with each other, ensuring that all release and deployment packages are able to be tracked etc. The release and deployment management is a part of the ITIL Service Transition. (Lacy, S. 2011)

In order to run a successful release and deployment management process, it includes following critical success factors: Firstly, the new or changed service capability and resources are established in the target environment or deployment group. Secondly, the new or changed service has been checked against the Service Design. Thirdly, the service capability has been confirmed in a pilot deployment. And lastly, re-usable test models are created which can be used for regression testing in upcoming releases. (Lacy, S. 2011)

The metrics for judging the effectiveness and efficiency in terms of the release and deployment management process are shown in the Figure 13 below.

Release and deployment management metrics according to ITIL®
Variance from service performance required by customers (minimal and reducing).
Number of incidents against the service (low and reducing).
Increased customer and user satisfaction with the services delivered.
Decreased customer dissatisfaction – service issues resulting from poorly tested or untested services increases the negative perception on the service provider organization as a whole.
Reduced resources and costs to diagnose and fix incidents and problems in deployment and production.
Increased adoption of the Service Transition common framework of standards, re-usable processes and supporting documentation.
Reduced discrepancies in configuration audits compared with the real world.

Figure 13. Release and deployment management metrics according to ITIL (Lacy, S. 2011)

As shown in the figure above, the main focus in the metrics is in performance, challenges, customer satisfaction, cost and resource aspects.

4.1.6.4 Capacity management

The capacity management process is responsible of ensuring that the capacity of IT services and the IT infrastructure is adequate in delivering the agreed service level targets effectively in terms of time and cost. The objectives of the capacity management include the following objects: Firstly, producing and maintaining a capacity plan, which mirrors the current and upcoming needs of the business. Secondly, providing guidance to all other areas of IT and the business regarding all issues in terms of capacity and performance. Thirdly, ensuring that the service performance meets all of the agreed performance targets. Fourthly, assisting with the diagnosis and resolution of the incidents and problems that are related to capacity and performance. Fifthly, assessing the impact of all changes which are in the capacity plan, as well as the capacity and performance of the resources and services. And finally, ensuring that proactive measures for improving the service performance are implemented cost effectively. The capacity management is a part of the ITIL Service Design. (Hunnebeck, L. 2011)

The main critical success factors for the capacity management process are the following: Firstly, having correct business forecasts. Secondly, having knowledge of current and upcoming technologies. Thirdly, having an ability to execute cost effectiveness. And finally, having an ability to plan and implement the adequate IT capacity matching with the business needs. (Hunnebeck, L. 2011)

The metrics for judging the effectiveness and efficiency in terms of the capacity management process are shown in the Figure 14 below.

Capacity management metrics according to ITIL®
Production of workload forecasts on time.
Percentage accuracy of forecasts of business trends.
Timely incorporation of business plans into the Capacity Plan.
Reduction in the number of variances from the business plans and Capacity Plans.
Increased ability to monitor performance and throughput of all services and components.
Timely justification and implementation of new technology in line with business requirements (time, cost and functionality).
Reduction in the use of old technology, causing breached SLAs due to problems with support or performance.
Reduction in last-minute buying to address urgent performance issues.
Reduction in the over-capacity of IT.
Accurate forecasts of planned expenditure.
Reduction in the business disruption caused by a lack of adequate IT capacity.
Relative reduction in the cost of production of the Capacity Plan.
Percentage reduction in the number of incidents due to poor performance.
Percentage reduction in lost business due to inadequate capacity.
All new services implemented match Service Level Requirements (SLRs).
Increased percentage of recommendations made by Capacity Management are acted on.
Reduction in the number of SLA breaches due to either poor service performance or poor component performance.

Figure 14. Capacity management metrics according to ITIL (Hunnebeck, L. 2011)

As shown in the figure above, the main focus in the metrics is in forecasting the business, understanding the current and future technologies, demonstrating the cost-effectiveness, and matching the IT capacity with the business needs.

4.1.6.5 Availability management

The availability management process targets to define, plan, analyze, measure and improve the availability of IT services. The process makes sure that all processes, tools, roles, and IT infrastructure are suitable regarding agreed availability goals. The objectives of the availability management consist of following items: Firstly, producing and maintaining a suitable availability plan that reflects the needs of the business. Secondly, providing guidance to all areas of IT and business regarding availability. Thirdly, ensuring that service availability meet the agreed targets. Fourthly, recognizing and resolving availability related incidents and problems. Fifthly, assessing the impact of all changes on availability plan and the capacity and performance of services and resources. And finally, ensuring that proactive measures are used for improving availability of services in a cost-effective manner. The availability management is a part of the ITIL Service Design. (Hunnebeck, L. 2011)

The main critical success factors for the availability management process are the following: Firstly, managing the availability and reliability of IT services. Secondly, satisfying the business needs regarding access to IT services. Thirdly, ensuring the availability of the IT infrastructure as it is agreed in the SLAs with an optimal cost. (Hunnebeck, L. 2011)

The metrics for judging the effectiveness and efficiency in terms of the availability management process are shown in the Figure 15 below.

Availability management metrics according to ITIL®
Percentage reduction in the unavailability of services and components.
Percentage increase in the reliability of services and components.
Effective review and follow-up of all SLA, OLA and underpinning contract breaches.
Percentage improvement in overall end-to-end availability of service.
Percentage reduction in the number and impact of service breaks.
Improvement in the MTBF (Mean Time Between Failures).
Improvement in the MTBSI (Mean Time Between Systems Incidents).
Reduction in the MTRS (Mean Time to Restore Service).
Percentage reduction in the unavailability of services.
Percentage reduction of the cost of business overtime due to unavailable IT.
Percentage reduction in critical time failures, e.g. specific business peak and priority availability needs are planned for.
Percentage improvement in business and users satisfied with service (by CSS results).
Percentage reduction in the cost of unavailability.
Percentage improvement in the Service Delivery costs.
Timely completion of regular Risk Analysis and system review.
Timely completion of regular cost-benefit analysis established for infrastructure Component Failure Impact Analysis (CFIA).
Percentage reduction in failures of third-party performance on MTRS/MTBF against contract targets.
Reduced time taken to complete (or update) a Risk Analysis.
Reduced time taken to review system resilience.
Reduced time taken to complete an Availability Plan.
Timely production of management reports.
Percentage reduction in the incidence of operational reviews uncovering security and reliability exposures in application designs.

Figure 15. Availability management metrics according to ITIL (Hunnebeck, L. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the availability and reliability of the IT services, matching IT services with business needs and cost of the availability of IT infrastructure.

4.1.6.6 Knowledge management

The knowledge management process targets to gather, store, analyze and share information and knowledge inside an organization. The main purpose of the knowledge management is to reduce the need for rediscovering knowledge and as a result of that, improve efficiency. The objectives of the knowledge management include the following items: Firstly, enable the service provider to be more efficient, reduce cost, and increase satisfaction. Secondly, ensure that the staff has a common understanding of the value their services are providing to customers. And thirdly, ensure that the service provider staff has sufficient information regarding their services. The knowledge management process is a part of the ITIL Service Transition. (Lacy, S. 2011)

An effective knowledge management is a powerful tool for users across all roles and stages of the service lifecycle. It is a well-functioning practice for people to share information, data and knowledge regarding IT services. It is recommended, that there would be a one and single system for knowledge management. (Lacy, S. 2011)

The metrics for judging the effectiveness and efficiency in terms of the knowledge management process are shown in the Figure 16 below.

Knowledge management metrics according to ITIL®
Successful implementation and early life operation of new and changed services with few knowledge-related errors.
Increased responsiveness to changing business demands, e.g. higher percentage of queries and question solved via single access to internet/intranet through use of search and index systems such as Google.
Improved accessibility and management of standards and policies.
Knowledge dissemination.
Reduced time and effort required to support and maintain services.
Reduced time to find information for diagnosis and fixing incidents and problems.
Reduced dependency on personnel for knowledge.

Figure 16. Knowledge management metrics according to ITIL (Lacy, S. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the effects of organization's knowledge in terms of errors, cost, efficiency etc.

4.1.6.7 IT service continuity management

The IT service continuity management process targets to control the risks that can critically impact IT services. This process is responsible of ensuring that the IT service provider is able to always provide according to the minimum agreed service levels. The service continuity management is closely connected to the business continuity management. The main objectives of the IT service continuity management consist of the following items: Firstly, maintaining a set of IT service continuity plans and IT recovery plans. Secondly, completing regular business impact analysis (BIA) exercises and ensuring that the continuity plans are up-to-date. Thirdly, conducting risk analysis and management exercises. Fourthly, providing guidance to all the areas of IT and business regarding on continuity and recovery aspects. Fifthly, ensuring that suitable continuity and recovery practices are utilized in order to meet the agreed business continuity targets. Also, assessing the impact of changes regarding the IT service continuity and IT recovery plans, and ensuring that proactive practices regarding the availability of services are utilized in a cost-effective manner. And finally, negotiating and agreeing the contracts with the suppliers regarding the provision of necessary recovery capability which can support the continuity plans. The IT service continuity management process is a part of the ITIL Service Design. (Hunnebeck, L. 2011)

The main critical success factors for the IT service continuity management process are the following two items: Firstly, that the IT services are delivered and that they can be recovered so that they meet the business objectives accordingly. And secondly, that there is awareness in all parts of the organization regarding the business and IT service continuity plans. (Hunnebeck, L. 2011)

The metrics for judging the effectiveness and efficiency in terms of the IT service continuity management process are shown in the Figure 17 below.

IT service continuity management metrics according to ITIL®
Regular audits of the ITSCM Plans to ensure that, at all times, the agreed recovery requirements of the business can be achieved.
All service recovery targets are agreed and documented in SLAs and are achievable within the ITSCM Plans.
Regular and comprehensive testing of ITSCM Plans.
Regular reviews are undertaken, at least annually, of the business and IT continuity plans with the business areas.
Negotiate and manage all necessary ITSCM contracts with third party.
Overall reduction in the risk and impact of possible failure of IT services.

Figure 17. IT service continuity management metrics according to ITIL (Hunnebeck, L. 2011)

As shown in the figure above, the main focus in the metrics is in understanding the continuity of IT services and all the aspects of ensuring the availability to the minimum agreed service levels.

4.2 SIAM Dashboard example

Measuring SIAM and SIAM Dashboard are both still relatively new subjects in the field of IT service management, and there is not a lot of best practice widely available regarding these subjects. This chapter demonstrates an example of a SIAM Dashboard published by itSMF Finland (IT Service Management Forum), which was built by combining SIAM best practice from six SIAM forerunner companies from Finland. This example of a SIAM Dashboard was proposed by industrial engineering students from Metropolia University of Applied Sciences in 2017, who collected the data from different companies, analyzed the results, and built the SIAM Dashboard based on the analyzed information. (Palomäki, et al. 2017)

The SIAM Dashboard was divided to four different parts: Service management office (SMO) dashboard, service desk dashboard, major incident management dashboard, and customer satisfaction dashboard. The purpose of separating the SIAM Dashboard into different parts is to make the using of the SIAM Dashboard easier for the user, as a large amount of data and information can be distributed logically into separate views. Each of the SIAM Dashboard parts are targeted for a specific function in SIAM, e.g. SMO KPIs for the indicators from the service management office. (Palomäki, et al. 2017)

The first part of the SIAM Dashboard (Palomäki, et al. 2017) – SMO KPIs are shown in the Figure 18 below.

	KPIs	Used by	Easily measurable	How to measure
A	Open Incidents	Most	Yes	The number of open incidents
B	Open Service Requests	Most	Yes	The number of open service request
C	Service Desk	Some	Yes	The overall performance of service desk (measured with weighting different aspects in service desk dashboard)
D	Security Breaches per Month	Most	Yes	How many security breaches have happened during the last 30 days
E	Customer Satisfaction	Most	Yes	The overall level of customer satisfaction. This is available on the customer satisfaction dashboard
F	SLA Requirements Met	Most	Yes	Number of breached SLAs divided with the total number of SLAs
G	OLA/UC Requirements Met	Most	Yes	Number of breached OLAs/UCs divided with the total number of OLAs/UCs
H	Service Transition Success Rate	Some	Difficult	Depends on the service. For example: How many major incidents happened during the first 30 days
I	Major Incidents	Most	Yes	Total number of major incidents in the last 30 days
J	Incident Business Impact	Some	Difficult	The business impact of incidents and major incidents in money (Lost hours, capacity etc. measured in money)
K	Overall	Some	Difficult	All aspects of the SMO Dashboard are being weighted, and the overall performance of the SIAM can be shown
L	Open Development projects/ Completeness	Some	Yes	Open development projects and news are being shown in this box

Figure 18. SIAM Dashboard, SMO KPIs (Palomäki, et al. 2017)

It is shown in the figure above, that according to this SIAM Dashboard example the SMO part focuses in the following objects: Number of open incidents, number of open service requests, service desk performance, number of security breaches per month, overall customer satisfaction level, percentage of SLA requirements met, percentage of OLA/UC

requirements met, service transition success rate, number of major incidents, incident business impact, the overall performance of the SMO, and the completeness of open development projects. (Palomäki, et al. 2017)

The second part of the SIAM Dashboard (Palomäki, et al. 2017) – Service Desk KPIs are shown in the Figure 19 below.

	KPIs	Used by	Easily measurable	How to measure
A	Number of Incidents	Most	Yes	Total number of incidents in the last 30 days
B	Open Incidents	Most	Yes	Total number of open incidents
C	Open Service Request	Most	Yes	Total number of open service requests
D	Number of Service Request	Most	Yes	Total number of service requests
E	First point of contact	Some	Yes	Number of incidents that were solved in the service desk without escalating the incident, divided with the total number of incidents in the last 30 days
F	SLA Requirements met	Most	Yes	Number of breached SLAs that are related to service desk, divided with the total number of SLAs related
G	OLA/UC Requirements met	Most	Yes	Number of breached OLAs/UCs, that are related to service desk, divided with the total number of OLAs/UCs related
H	Average end to end resolution time	Most	Yes	Average time from the moment when the user has sent the incident to the time when the incident was closed.
I	Open Major Incidents	Most	Yes	Total number of open major incidents
J	Incidents about to breach the SLA	Most	Yes	Number of incidents that are about the breach the SLA. (for example, 6 hours until the SLA will be breached)
K	Tickets that did not pass	Some	Yes	Number of tickets that were not accepted by the user, divided with the total number of the incidents
L	Customer / User satisfaction to help desk	Most	Yes	Question queries

Figure 19. SIAM Dashboard, Service Desk KPIs (Palomäki, et al. 2017)

It is shown in the figure above, that according to this SIAM Dashboard example the Service Desk part focuses in the following objects: Number of incidents, number of open

incidents, number of open service requests, number of service requests, number of incidents solved with first point of contact, percentage of SLA requirements met, percentage of OLA/UC requirements met, average incident end-to-end resolution time, number of major incidents, number of incidents about to breach SLA, percentage of tickets that were not accepted by the user, and customer satisfaction. (Palomäki, et al. 2017)

The third part of the SIAM Dashboard (Palomäki, et al. 2017) – Major Incident KPIs are shown in the Figure 20 below.

	KPIs	Used by	Easily measurable	How to measure
A	Major Incidents	Most	Yes	Total number of major incidents in the last 30 days
B	Open Major Incidents	Most	Yes	Number of major incidents that are not solved/closed currently
C	Root cause not defined	Some	Yes	Number of major incidents where root cause report is not sent in the last 30 days
D	Average Resolution time	Most	Yes	Total hours spent for resolution divided with the number of major incidents in the last 30 days
E	SLA Requirements met	Most	Yes	Number of breached SLAs related to Major incidents divided with the total number of related SLAs in the last 30 days
F	OLA/UC Requirements met	Most	Yes	Number of breached OLAs/UCs, related to Major incidents divided with the total number of related OLAs/UCs in the last 30 days
G	Business Impact	Some	Difficult	The business impact of the major incidents in money (Lost hours, capacity etc. measured in money) in the last 30 days
H	Recurring Major Incidents	Some	Yes	Number of major incidents that already were solved once in the last 30 days
I	Major Incident/ Report	Most	Yes	The report about the major incident, which explains what, when, why and how the problem was solved

Figure 20. SIAM Dashboard, Major Incident KPIs (Palomäki, et al. 2017)

It is shown in the figure above, that according to this SIAM Dashboard example the Major Incident part focuses in the following objects: Number of major incidents, number of open

major incidents, number of major incidents where root cause has not yet been defined, average resolution time of major incidents, percentage of SLA requirements met, percentage of OLA/UC requirements met, major incident business impact, number of recurring major incidents, and the status of latest major incident report. (Palomäki, et al. 2017)

The fourth and last part of the SIAM Dashboard (Palomäki, et al. 2017) – Customer Satisfaction KPIs are shown in the Figure 21 below.

	KPIs	Used by	Easily measurable	How to measure
A	Satisfied to helpdesk	Most	Yes	End user queries
B	Satisfied to maintenance	Some	Yes	Customer queries
C	Satisfied to performance	Most	Yes	End user/customer queries
D	Brings value to business	Some	Yes	Customer/buyer query
E	Easy to use	Most	Yes	End user queries
F	Flexibility	Most	Yes	Customer/end user queries
G	NPS	Some	Yes	NPS Survey
H	Would recommend	Most	Yes	End user/Customer queries
I	Overall	Most	Yes	Certain questions are weighted differently than others, and then the overall is being count.

Figure 21. SIAM Dashboard, Customer Satisfaction KPIs (Palomäki, et al. 2017)

According to this SIAM Dashboard example the Customer Satisfaction part focuses on the following objects, which are questions directed to the user: Satisfied to helpdesk, satisfied to maintenance, satisfied to performance, value to the business, easy to use, flexibility, NPS, would recommend, and the overall. (Palomäki, et al. 2017)

4.3 Summary of the available knowledge

The knowledge regarding ITIL Service Operation processes consisted of key information regarding the core processes of the ITIL Service Operation and other core processes (from other ITIL lifecycle phases), which are closely related to the ITIL Service Operation

(e.g. Change management, capacity management, availability management etc.). The key information discussed with each core process consisted of information regarding the overview, purpose, metrics and critical success factors. This key information, especially the metrics and success factors of each core process discussed will be discussed in a workshop together with the head of SMO and the service managers. In the workshop, the focus is on defining which of the core process metrics will benefit the SMO the most when they are (and can be) monitored, and these metrics can be used in the final SIAM Dashboard which is built for the case company.

The knowledge regarding SIAM Dashboards discussed one example of a SIAM Dashboard, which consisted of four (4) different views and KPIs for the users. These different views of the SIAM Dashboard focused on different areas inside SIAM. The areas consisted of the following: SMO, Service Desk, Major Incident Management and Customer Satisfaction. This example of a SIAM Dashboard was built by combining SIAM best practice from six SIAM forerunner companies from Finland.

The knowledge regarding ITIL Service Operation metrics and critical success factors, and SIAM Dashboards gathered in this chapter will be used for building the SIAM Dashboard proposal. The summary of the knowledge gathered is demonstrated in the Figure 22 below.

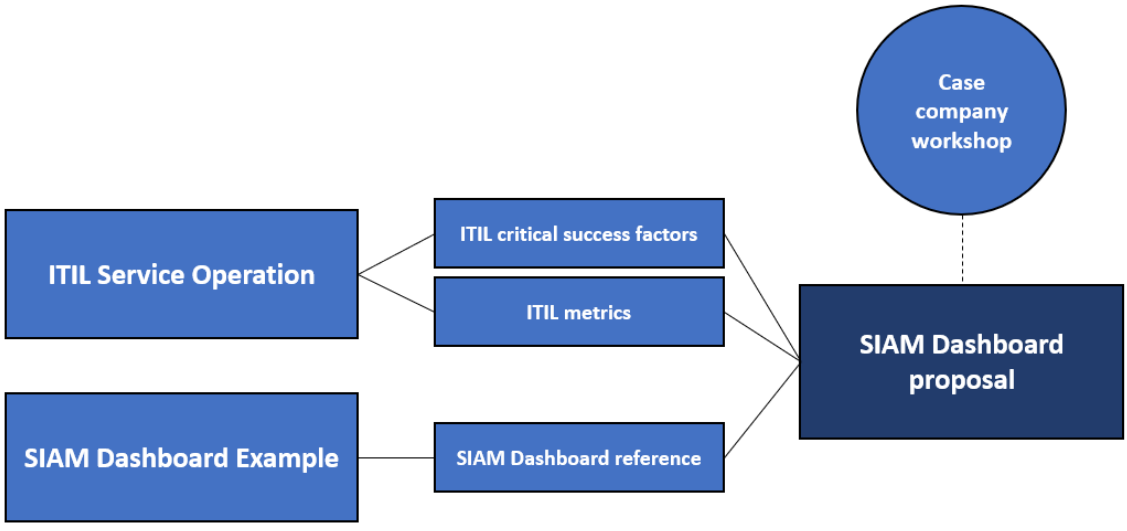

Figure 22. Summary of knowledge gathered for building the SIAM Dashboard proposal

As shown in the figure above, the knowledge regarding ITIL critical success factors, ITIL metrics and the SIAM Dashboard reference will be used in building of the SIAM Dashboard proposal. Next, a case company workshop will be held together with the service managers and the head of SMO where the SIAM Dashboard and KPI requirements will be determined. This workshop will be discussed in the following chapter.

After the SIAM Dashboard and KPI requirements have been determined, the SIAM Dashboard proposal can be built by using the critical success factors, metrics, and the SIAM dashboard reference gathered in this chapter.

5 SIAM Dashboard proposal for the case company

This chapter merges the results of the current state analysis and the available knowledge towards building the proposal. The main focus in this chapter will be in building the SIAM Dashboard proposal which is designed for the case company.

The proposal is built based on Data 1 (case company interviews on current SMO practices) discussed in chapter 3, Data 2 (case company workshop on SIAM Dashboard and KPI requirements) which will be described in chapter 5.3 below, and by using applicable elements of available knowledge and best practice discussed in chapter 4. Details of building the SIAM Dashboard for the case company are described in the chapters below.

This chapter first goes through the overview of key findings from the Data 1 and Available Knowledge. Then, it discusses the building of the SIAM Dashboard proposal for the case company where the methods used for building the SIAM Dashboard are described. After this, the SIAM Dashboard and KPI requirements are defined together with the head of SMO and the service managers by analyzing the contents of Available Knowledge (chapter 4). This is followed by the proposal of the case company SIAM Dashboard. This chapter then ends with a summary of the SIAM Dashboard proposal for the case company.

A summary of the data collection is presented in the Figure 23 below.

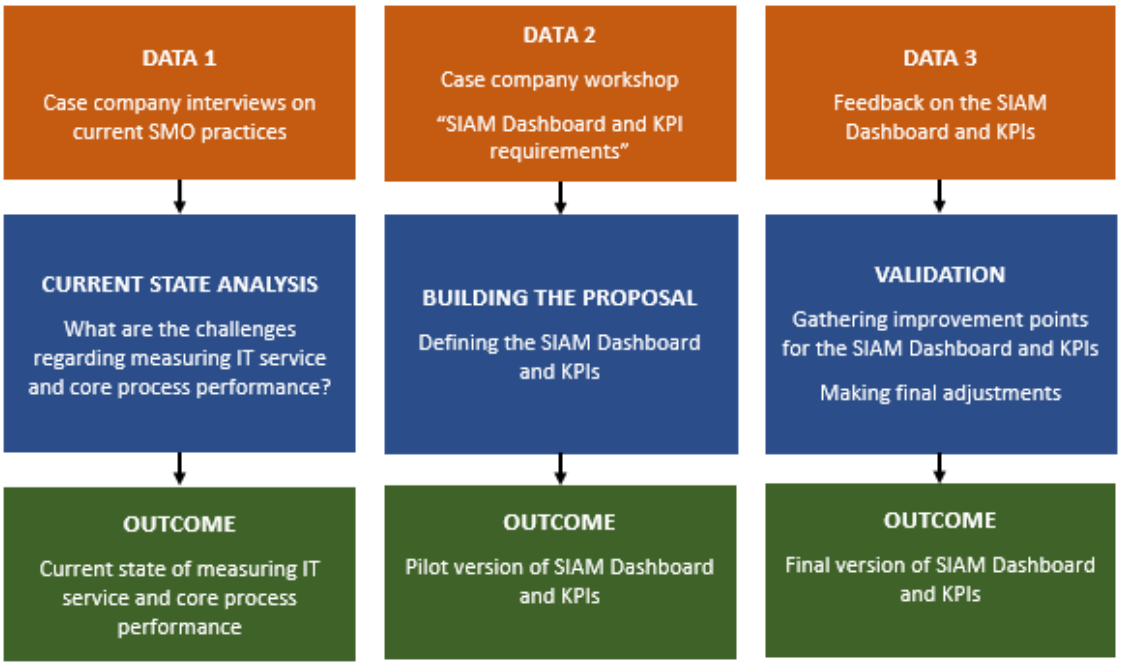

Figure 23. Summary of the data collection

The figure above describes the different data required for this thesis. So far, the Data 1 (Case company interviews on current SMO practices) has been collected. The Data 2 (SIAM Dashboard and KPI requirements) will be gathered and discussed in this chapter. And finally, the Data 3 (Feedback on the SIAM Dashboard and KPIs) will be collected and analyzed in chapter 6 (Validation of the proposal).

5.1 Overview of key findings from Data 1 and Available Knowledge

Based on the findings made in Data 1 (chapter 3), the main challenge is that there is currently no standardize set of KPIs available for the service managers for measuring their IT services and core process performance. The main weakness is that because different indicators for success are used, there is currently no common understanding regarding the IT service and core process success factors between the service managers. There are currently no unified, consistent or standardized KPIs for measuring the IT service and core process performance available for the service managers.

The goal is to gather and standardize a set of KPIs based on the case company SMO requirements and provide the SMO real-time information regarding the performance of

the performance of the IT services and core processes (e.g. status of incident management, change management, problem management and other core processes).

The available knowledge provided understanding regarding the core processes of the ITIL Service Operation and the other core processes which are closely related to the ITIL Service Operation. The available knowledge most importantly discussed a lot of information regarding the metrics and the critical success factors which are generally used within these areas. This part also discussed one example of a SIAM Dashboard, which consisted of four (4) different views and KPIs for the users. These different views of the SIAM Dashboard focused on different areas inside SIAM. This SIAM Dashboard was built by combining SIAM best practice from six SIAM forerunner companies from Finland.

5.2 Building of the SIAM Dashboard proposal for the case company

The building of the SIAM Dashboard proposal for the case company was started with a workshop, which was held together with the case company's head of SMO and the service managers to discuss the case company SIAM Dashboard and KPI requirements. In this workshop, the material from chapter 4 was analyzed in-depth focusing on the ITIL metrics and critical success factors, and the SIAM Dashboards (examples). The main focus in the workshop was to gain understanding about the most important areas of the SMO in terms of IT service and core process performance and choose the relevant KPIs based on this information.

The metrics and critical success factors from chapter 4.2 were reviewed together with the head of SMO and the service managers, and this provided the background info on what metrics are commonly used according to ITIL best practice. The SIAM Dashboards examples from chapter 4.3 were also reviewed, and this provided a benchmark for building the SIAM Dashboard for the case company. Based on these SIAM Dashboards examples, it was decided that the SIAM Dashboard for the case company will also be separated into different parts. The main purpose of dividing the SIAM Dashboard into parts is to make using of the SIAM Dashboard easier for the users, by not making the user view cluttered.

The outcome of the SIAM Dashboard proposal for the case company is a SIAM Dashboard pilot, which is the first version of the SIAM Dashboard. The SIAM Dashboard pilot

will be proposed to be implemented in the case company ITSM tool and to be tested over a certain period. It will then be validated together with the head of SMO and the service managers. In this validation, the fit of the SIAM Dashboard will be evaluated against the case company requirements, and the final adjustments will be done based on this information.

5.3 SIAM Dashboard and KPI requirements

The input for the case company SIAM Dashboard comes from the ITIL processes which the SMO (SIAM function) is built on. Currently, there is a lot of information regarding the IT service and core process performance available from the ITIL processes in the case company's ITSM tool. The first step is to define the most important key process areas (and the key information) which should be monitored by the case company's head of SMO and the service managers. The head of SMO and the service managers are the main users of the SIAM Dashboard, and the importance of the key process information will be evaluated based on their knowledge and experience. The focus will be on defining KPIs that can be executed easily by using the information available from the ITSM tool.

There were five most important process areas which were raised by the head of SMO and the service managers: Incident management, change management, request fulfilment, problem management and knowledge management. The importance of these process areas was recognized in the CSA stage and confirmed in the beginning of building of the proposal stage by the head of SMO and the service managers. More detailed information regarding the importance of these process areas is analyzed in the chapters below.

5.3.1 Incident management

According to the head of SMO and the service managers, the most important area to focus on in terms of measuring IT service and core process performance is incident (and major incident) management. This area is the most critical because incidents (and especially major incidents) can directly affect the levels of service availability. When critical incidents occur, and services are not available, this can instantly cause problems for the business. This will create costs coming from the business organization not being able to utilize the needed IT services, and create costs required for fixing the problem.

After analyzing the metrics and critical success factors described in Figure 7 (Incident management metrics according to ITIL) together with the head of SMO and the service managers, the conclusion was the following: In incident (and major incident) management it is important to be aware of the quantity of incidents and understand how they can be categorized. By categorizing incidents, they can be efficiently organized and solved in the right order, from the most urgent to the least urgent. It is important that in the SIAM Dashboard, it is possible to easily understand: How many incidents there are, what is their priority and what is their status. It is important to separate the major incident indicators from the regular incident indicators, so that for example the trends of major incidents specifically can be understood easily.

As the case company has different locations where it operates, the incidents can also be categorized by the location. This helps the SIAM Dashboard user understand the current state regarding incidents in general and in different locations. Incidents can also be categorized by their state (new, in progress, on hold). One of the important differentiators between the incidents is also how old is the incident. For example, in case where there are many incidents that are older than 30 days, that might give some valuable information regarding situation in the SMO and the on the capability for solving incidents. The head of SMO also stated that the SLA (service level agreement) compliance is an important aspect to follow in terms of incidents and major incidents. This is to be aware of the breaches caused by the incidents, so that reacting can be quick.

According to the head of SMO and the service managers, it is also important to see how many incidents and major incidents are caused by certain services. Security incidents are also a risk for the case company, and it is critical to understand which services are causing them. One of the service managers pointed out that changes can also cause incidents, and it is important that these can also be monitored. Another important aspect is the average end-to-end resolution time, this can be used for comparing the resolution time of incidents according to services and priority. The final aspect that was discussed with the head of SMO and the service managers in terms of incidents, was the importance of understanding how many of the incidents are resolved using knowledge articles. This indicator helps the SMO understand that what part of the incidents can be handled autonomously. The creation of knowledge articles takes effort, and this is crucial for understanding the value that comes out from it.

5.3.2 Change management

The head of SMO and the service managers believe that change management has a very high importance when it comes to measuring IT service and core process performance. This is because it is important to be aware of the changes that are happening and have already happened as they can affect the SMO in many different ways (e.g. cause incidents, problems, etc.).

After analyzing the metrics and critical success factors described in Figure 11 (Change management metrics according to ITIL) together with the head of SMO and the service managers, the conclusion was the following: In change management it is important to be aware of the quantity of changes in different areas and understand how they can be categorized. Changes can be divided into different types (e.g. normal, standard, emergency, etc.) and states (e.g. new, under assessment, closed, etc.). Regarding different change types, emergency changes is something that should be highly focused on. This is because the emergency changes usually hold more risk compared to other change types, and these should be monitored with close attention. Also, there are changes that are implemented outside of the change window. These can also hold more risk compared to standard changes, which means that they also should be monitored.

According to the head of SMO, it would also be important to see the status of the changes planned for the ongoing week. This helps the SIAM Dashboard user to understand the progress regarding the changes planned for the ongoing week. One of the service managers also pointed out that it is important to understand how the changes correlate with different vendors. This is to see the change behavior and development in terms of different vendors.

5.3.3 Request fulfilment

In terms of measuring IT service and core process performance, the service managers and the head of SMO stated that request fulfilment is also an important process to monitor. This is because even if the requests are low cost, low risk, frequently occurring etc., the overall quantities of the different service requests and the ratio between the service requests and changes are important to understand.

After analyzing the metrics and critical success factors described in Figure 8 (Request fulfilment metrics according to ITIL) together with the head of SMO and the service managers, the conclusion was the following: In request fulfilment it is important to be aware of the quantities of service requests and the time used for handling them. The service requests can also be divided to different stages (e.g. logged, WIP, closed, etc.). According to the service managers, it is also important to understand if the service requests are completed within agreed timelines, because if not, there can be underlying problems that are causing this that require immediate attention. Another aspect that is also important is the average cost of the service requests divided by type. However, this requires a bit more effort as the calculations have to be done and maintained by someone in the case company, so that the information is always correct. The head of SMO also added that the client satisfaction is also important what comes to understanding IT service and core process performance. For example, if the client satisfaction is suddenly steeply decreasing, this can be a message from a critical underlying problem that needs to be solved as soon as possible.

5.3.4 Problem management

Problem management is an important process to monitor in terms of IT service and core process performance according to the head of SMO and the service managers. This is because problems can be potential threats that can in the worst case affect the IT service availability or quality. By being able to monitor this process, the head of SMO and the service managers are able to react to possible threats accordingly.

After analyzing the metrics and critical success factors described in Figure 9 (Problem management metrics according to ITIL) together with the head of SMO and the service managers, the conclusion was the following: In problem management it is most important to be aware of the quantity of the problems. According to the head of SMO, it is important to monitor if the problems can be resolved within the SLA targets. This can indicate if there are further actions that should be taken, in case where the SLAs are constantly violated. The head of SMO also emphasizes the importance of the average cost of handling a problem. As in the request fulfilment, this also requires effort as the calculations have to be done and maintained by someone in the case company, so that the information is always correct.

5.3.5 Knowledge management

The head of SMO and the service managers stated that the knowledge management is also an important process to monitor in terms of IT service and core process performance. This is because it is important to understand how much of the stored knowledge can be exploited for the use of the case company.

After analyzing the metrics and critical success factors described in Figure 16 (Knowledge management metrics according to ITIL) together with the head of SMO and the service managers, the conclusion was the following: In knowledge management it is most important to understand the quantities of knowledge articles published for different services. This indicates the knowledge activities related to services, if the activity is high and a lot of knowledge is built on a certain service, this can for example decrease the average time required for fixing a problem related to this service. The service managers stated that a lot of information regarding the use of knowledge articles could be used for indicating different success factors. For example, how the knowledge articles have improved accessibility of services by decreasing downtime, how the knowledge articles have reduced the time needed for maintaining certain services, etc. However, defining the important KPIs regarding this can be challenging, as this type of information can be categorized as more of “nice to have” instead of “must have”.

5.3.6 The SIAM Dashboards

The SIAM Dashboards examples from the chapter 4.3 were reviewed with the head of SMO and the service managers. After analyzing the dashboards more in-depth, several items regarding the dashboards were discussed. According to the head of SMO, the SMO KPIs consisted of very straight-forward and important KPIs. The head of SMO and the service managers stated that the most important KPIs according to their experience were the open incidents, open service requests, security breaches per month, customer satisfaction, SLA requirements met and the major incidents. Measuring incident business impact would also be a very powerful indicator to be used in the SIAM Dashboard, but implementing and maintaining this type of KPI can be challenging. It is not quite clear how much time and expertise defining the required variables would consume. This would also require someone take the responsibility of making sure that this data is accurate for the use of the case company. According to the head of SMO, measuring the overall performance of the service desk and the SMO KPIs can be challenging. It can be difficult

to define the percental value of each KPIs within the service desk and SMO, and this is the reason why it can be very hard to indicate the overall performance for a certain area just by using one KPI.

The head of SMO and the service managers had the following thoughts regarding the service desk KPIs. The dashboard consisted of very important KPIs as well, but they were also a bit overlapping with the SMO KPIs. According to the head of SMO and the service managers, the important KPIs from the service desk dashboard included the number of incidents, open incidents, open service requests, number of service requests, SLA requirements met, average end-to-end resolution time and open major incidents. One of the service managers noted that in the service desk dashboard, the “number of incidents” KPI was measured by the total number of incidents in the last 30 days. This is an import approach to measuring incidents in past time as the average can be easily monitored by using this indicator. With this KPI, it can be compared if the total number of incidents in the last 30 days is higher or lower compared to the general average or target set for this KPI. Whether the value is higher or lower, this value describes the level of load regarding the incidents and the potential risk level which correlates with the value.

The major incident KPIs were also reviewed by the head of SMO and the service managers, in which they stated as following: The major incident KPIs are very important and certain KPIs will also be used in the SIAM Dashboard which is built for the case company. Number of open major incidents, SLA requirements met, and average resolution time are very important KPIs to monitor in terms of measuring IT service and core process performance according to the head of SMO and the service managers. Business impact is a very important KPI, but also in this case the defining and maintaining of the correct variables and data can be challenging and might require more resources to be used in order to be able to gain the desired value.

The head of SMO and the service managers also reviewed the customer satisfaction KPIs, and the conclusion was following: In terms of measuring IT service and core process performance these KPIs are very important, but the SMO is limited in using the data which is available in the ITSM tool. By using this example, the customer satisfaction indicators and the questionnaires which are sent to the users and used as input for these KPIs would have to be completely rebuilt. The customer satisfaction is something that should and will be considered when assessing the IT service and core process performance, but it will be done separately outside the SIAM Dashboard.

As discussed in the SIAM Dashboards example in chapter 4.3, SIAM Dashboard is a set of indicators which can be divided into different parts. The main reason for separating the SIAM Dashboard into different parts is to make the using of the SIAM Dashboard easier for the user, as a large amount of data and information can be distributed logically into separate views. It is decided by the head of SMO and the service managers that the SIAM Dashboard will be divided into different parts, but not by key areas. Different key areas will be presented together in the different parts of the SIAM Dashboard. The reason for this is that by using this approach the users of the SIAM Dashboard are able to get the most important information from different key areas in the same view. This makes it easier to understand the overall IT service and core process performance regarding SIAM, without the need to search through different key areas separately.

5.3.7 Specifications of the case company SIAM Dashboard

According to the head of SMO, the target is to provide a clear, but a comprehensive SIAM Dashboard which gives the user the most important information regarding IT service and core process performance.

The SIAM Dashboard built for the case company will be separated into three different dashboards consisting of different KPIs. The dashboards are divided as following: Service Manager – Current State Dashboard, Service Manager – Last Month Dashboard, and SMO Dashboard. The Service Manager – Current State Dashboard presents the KPIs that provide relevant information of the current state regarding the IT services and core process performance the service manager is responsible for. The Service Manager – Last Month Dashboard presents the KPIs that provide relevant information regarding the IT services and core process performance the service manager is responsible for from a past perspective. The Service Manager – Last Month dashboard can also include KPIs which measure the items from a longer period, for example longer than 30 days. The final dashboard, SMO Dashboard focuses on the KPIs providing information from the SMO on a high-level. The main focus in the SMO Dashboard is on ticket trends, presenting the overall quantities of different items such as incidents, problems, service requests, etc. This is to provide a comprehensive overview of the SMO that includes all the relevant KPIs the head of SMO requires for SMO performance monitoring and case company reporting purposes.

The decision was made together with the head of SMO and the service managers, that only the most important processes and KPIs are presented in the SIAM Dashboard. Because the SIAM Dashboard is used as a day-to-day tool by the service managers and the head of SMO, the main goal is to keep the SIAM Dashboard easily readable focusing on quality of the KPIs and avoiding filling the SIAM Dashboard quantitively with unnecessary KPIs. Because incident (and major incident) management and change management are so important by holding business critical aspects, the SIAM Dashboard is highly focused on these two areas. The most important request fulfilment, problem management and knowledge management KPIs are also presented in the SIAM Dashboard, but because the quantity of the KPIs are limited to a certain amount, they will not be presented as much due to the higher importance of incident management and change management. The SIAM Dashboard KPIs will be divided as following:

The Service Manager – Current State Dashboard will consist of twelve (12) different KPIs. Five (5) incident management KPIs, three (3) change management KPIs, one (1) request fulfilment KPI, one (1) problem management KPIs, and two (2) general KPIs.

The Service Manager – Last Month Dashboard will consist of nineteen (19) different KPIs. Ten (10) incident management KPIs, five (5) change management KPIs, three (3) request fulfilment KPIs, and one (1) knowledge management KPI.

The SMO Dashboard will consist of twenty-one (21) different KPIs. Eleven (11) incident management KPIs, four (4) change management KPIs, and six (6) general KPIs.

5.4 The case company SIAM Dashboard proposal

This chapter first shows the Service Manager, Current State dashboard. Secondly, it shows the Service Manager, Last Month dashboard. And thirdly, it shows the SMO dashboard. This chapter also shows an overview of the case company SIAM Dashboard within the ITSM tool.

5.4.1 SIAM Dashboard – Service Manager, Current State

The Service Manager, Current State dashboard and KPIs for measuring IT service and core process performance are shown in the table below. The KPIs have been hidden for confidentiality reasons.

KPIs	Easily measurable	How to measure
Incident KPIs		
Incident KPI 1	-	-
Incident KPI 2	-	-
Incident KPI 3	-	-
Incident KPI 4	-	-
Incident KPI 5	-	-
Change KPIs		
Change KPI 1	-	-
Change KPI 2	-	-
Change KPI 3	-	-
Other KPIs		
Other KPI 1	-	-
Other KPI 2	-	-
Other KPI 3	-	-
Other KPI 4	-	-

This Service Manager – Current State dashboard focuses on the KPIs that provide relevant information of the current state regarding the IT services and core process performance the service manager is responsible for.

5.4.2 SIAM Dashboard – Service Manager, Last Month

The Service Manager, Last Month dashboard and KPIs for measuring IT service and core process performance are shown in the table below. The KPIs have been hidden for confidentiality reasons.

KPIs	Easily measur-able	How to measure
Incident KPIs		
Incident KPI 1	-	-
Incident KPI 2	-	-
Incident KPI 3	-	-
Incident KPI 4	-	-
Incident KPI 5	-	-
Incident KPI 6	-	-
Incident KPI 7	-	-
Incident KPI 8	-	-
Incident KPI 9	-	-
Incident KPI 10	-	-
Change KPIs		
Change KPI 1	-	-
Change KPI 2	-	-
Change KPI 3	-	-
Change KPI 4	-	-
Change KPI 5	-	-
Other KPIs		
Other KPI 1	-	-
Other KPI 2	-	-
Other KPI 3	-	-
Other KPI 4	-	-

The Service Manager – Last Month dashboard focuses on the KPIs that provide relevant information regarding the IT services and core process performance the service manager is responsible for from a past perspective. The Service Manager – Last Month dashboard can also include KPIs which measure the items from a longer period, for example longer than 30 days.

5.4.3 SIAM Dashboard – SMO

The SMO dashboard and KPIs for measuring IT service and core process performance are shown in the table below. The KPIs have been hidden for confidentiality reasons.

KPIs	Easily measurable	How to measure
Incident KPIs		
Incident KPI 1	-	-
Incident KPI 2	-	-
Incident KPI 3	-	-
Incident KPI 4	-	-
Incident KPI 5	-	-
Incident KPI 6	-	-
Incident KPI 7	-	-
Incident KPI 8	-	-
Incident KPI 9	-	-
Incident KPI 10	-	-
Incident KPI 11	-	-
Change KPIs		
Change KPI 1	-	-
Change KPI 2	-	-
Change KPI 3	-	-
Change KPI 4	-	-
Other KPIs		
Other KPI 1	-	-
Other KPI 2	-	-
Other KPI 3	-	-
Other KPI 4	-	-
Other KPI 5	-	-
Other KPI 6	-	-

SMO dashboard focuses on the KPIs providing information from the SMO on a high-level. The main focus in the SMO dashboard is on ticket trends, presenting the overall quantities of different items such as incidents, problems, service requests, etc. This is to provide a comprehensive overview of the SMO that includes all the relevant KPIs the

head of SMO requires for SMO performance monitoring and case company reporting purposes.

5.5 The case company SIAM Dashboard pilot

After the case company SIAM Dashboard proposal was built, it was presented to the head of SMO and the service managers. The SIAM Dashboard and the KPIs chosen for the proposal were reviewed and approved by the head of SMO and the service managers. After the approval, the next steps were agreed on. It was decided by the head of SMO and the service managers that the SIAM Dashboard proposal would be piloted as it was proposed.

The SIAM Dashboard proposal would be implemented in the case company's ITSM tool, and it would be piloted over a two (2) week period. Within this period, the head of SMO and the service managers would test the performance of the SIAM Dashboard in practice. The SIAM Dashboard would be used on a day-to-day basis by the head of SMO and the service managers to monitor and measure IT service and core process performance from the service managers' individual perspective, and the head of SMO's high-level perspective. The evaluation would be then performed based on how well it could be used for that purpose, and if there are any gaps or point of improvements noticed, the SIAM Dashboard and the KPIs would be adjusted accordingly.

5.6 Summary of the SIAM Dashboard proposal for the case company

This chapter first provided an overview of the key findings made in the Current State Analysis and the Available Knowledge stages. This included discussing the main challenge discovered in the CSA stage, which was that there is currently no standardized KPIs available for the service managers for measuring IT services and core process performance. The main weakness is that because different indicators for success are used, there is currently no common understanding regarding the IT service and core process success factors between the service managers. Based on this, the goal is to gather and standardize a set of KPIs based on the case company SMO requirements

and provide the SMO real-time information regarding the performance of the performance of the IT services and core processes. This also included discussing the Available Knowledge related to the main challenge and weakness, which most importantly consisted of the metrics and the critical success factors which are generally used within ITIL Service Operation and other closely related core processes.

After the overview of the key findings were analyzed, the building of the SIAM Dashboard proposal was discussed which provided understanding regarding how the case company SIAM Dashboard proposal was built. It was started with a workshop which was held together with the head of SMO and the service managers. The focus in the workshop was to define the SIAM Dashboard and KPI requirements, by using the conclusions from the Current State Analysis stage, and the knowledge regarding the ITIL metrics and critical success factors as a reference. The outcome of the SIAM Dashboard proposal for the case company is a SIAM Dashboard pilot, which will be proposed to be implemented in the case company ITSM tool and to be tested over a certain period. Finally, the SIAM Dashboard pilot will be validated together with the head of SMO and the service managers after the testing period, and the final adjustments to the case company SIAM Dashboard will be done based on their feedback.

The most important process areas within the SMO were defined together with the head of SMO and the service managers. They consisted of the following: Incident management, change management, request fulfilment, problem management and knowledge management. Because incident (and major incident) management and change management are so important by holding business critical aspects, the SIAM Dashboard will be highly focused on these two areas. It was also decided that the SIAM Dashboard for the case company would be divided to different views, in order to make it easier to understand for the SIAM Dashboard user. The case company SIAM Dashboard was separated into three different parts: Service Manager – Current State Dashboard, Service Manager – Last Month Dashboard, and SMO Dashboard. The case company SIAM Dashboard proposal (SIAM Dashboard pilot) and the chosen KPIs are described and analyzed in more detail in this chapter.

The SIAM Dashboard proposal was presented to the case company head of SMO and the service manager. After the SIAM Dashboard and the KPIs were approved, the SIAM Dashboard pilot was started by implementing the SIAM Dashboard to the ITSM tool. The SIAM Dashboard was piloted in the case company over a two (2) week period, where

the head of SMO and the service managers utilized the SIAM Dashboard in their day-to-day operations, measuring and monitoring IT service and core process performance within the SMO. The SIAM Dashboard would be adjusted and improved according to the feedback received from the head of SMO and the service managers after the two-week SIAM Dashboard piloting period.

6 Validation of the proposal

This section describes the results of validation of the Proposal developed and implemented in chapter 5. This first describes a short overview of the validation stage. After this, an overview of the SIAM Dashboard within the ITSM tool is shown. Then this chapter focuses on analyzing the feedback and evaluation of the case company SIAM Dashboard proposal. And finally, this chapter presents the summary of the validation of the case company SIAM Dashboard proposal.

6.1 Overview of the validation stage

The SIAM Dashboard proposal was implemented by the case company and it was piloted over a two (2) week period by the head of SMO and the service managers. The focus on the SIAM Dashboard pilot was on using the SIAM Dashboard on a day-to-day basis and evaluating if the SIAM Dashboard was able to provide all the critical information regarding the IT service and core process performance that the head of SMO and the service managers required in their daily work.

6.2 Overview of the case company SIAM Dashboard within the ITSM tool

In this section, an overview of the SIAM Dashboard implemented in the case company is shown consisting of screenshots taken from the case company ITSM tool.

Screenshots from the case company SIAM Dashboard presented in Figure 24 below. The KPIs have been hidden for confidentiality reasons.

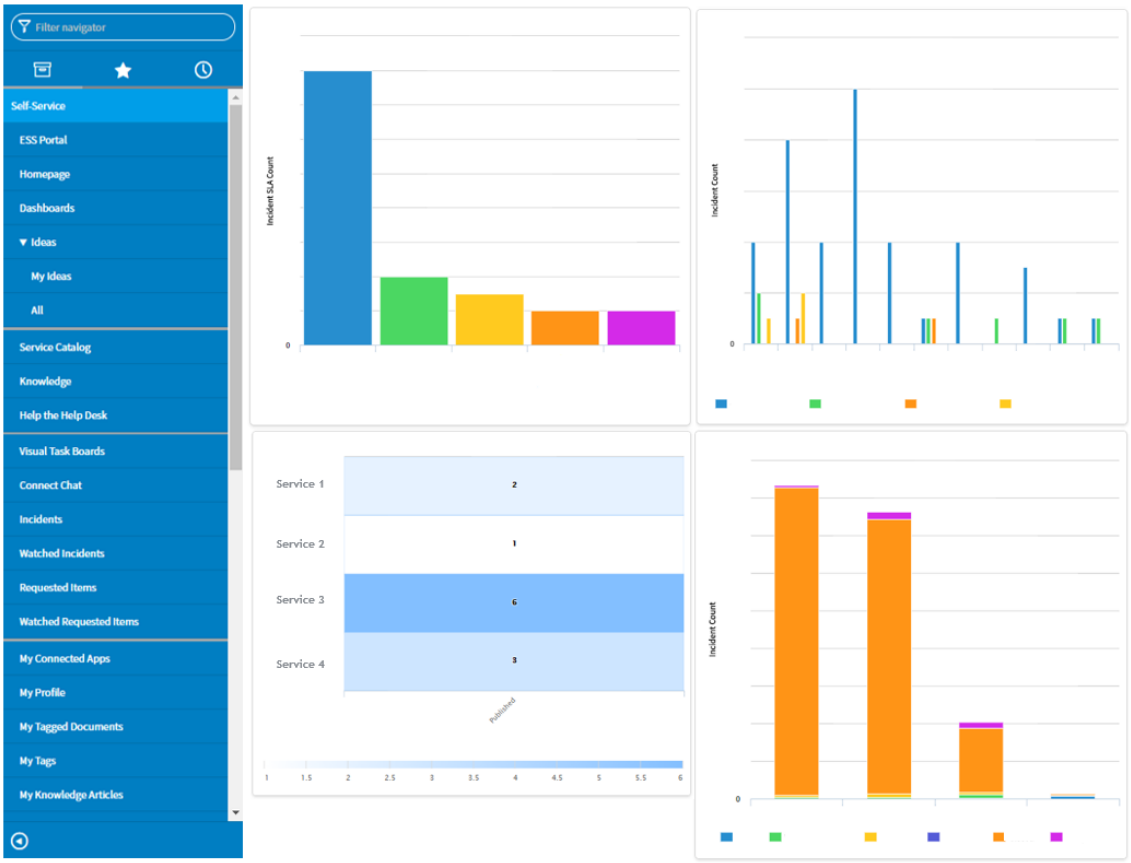

Figure 24. Overview of the Service Manager – Last Month Dashboard

The figure above demonstrates the Service Manager – Last Month Dashboard interface. The SIAM Dashboard interface consists of the navigation panel on the left, and it presents four (4) different KPIs on the right. The names of the KPIs, services and scales have been hidden for confidentiality reasons.

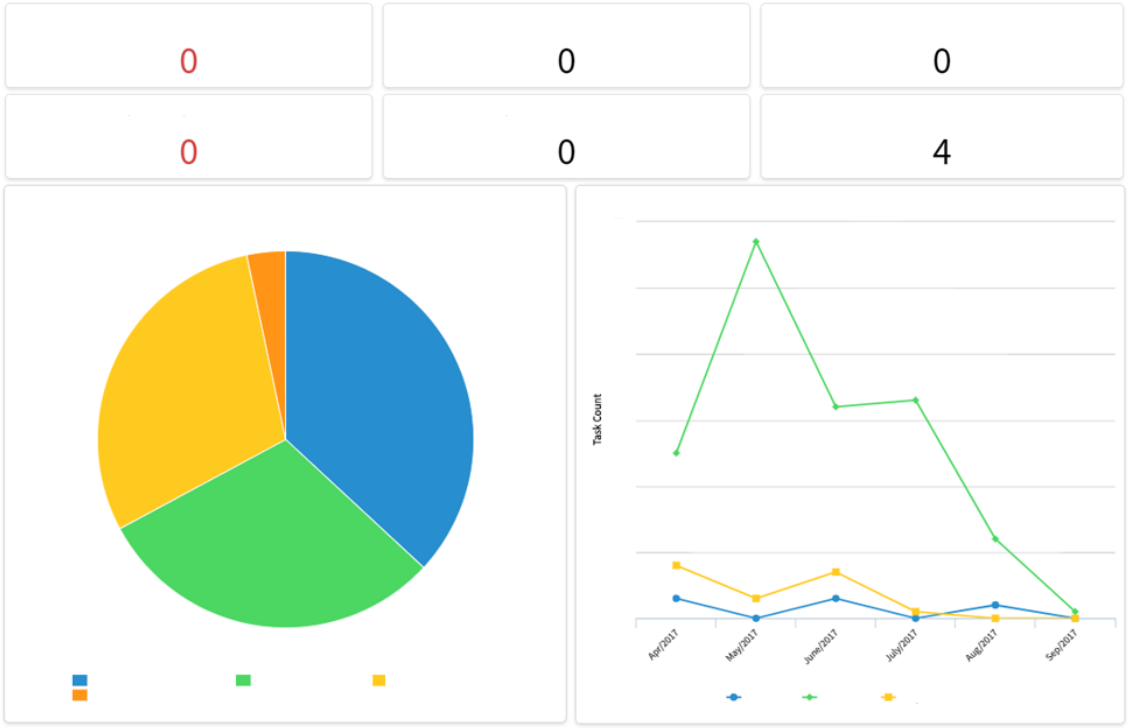

Figure 25. Overview of different KPIs used in the SIAM Dashboard

The figure above demonstrates different types of KPIs used in different SIAM Dashboard views (Service Manager – Current State, Service Manager – Last Month, and SMO). The names of the KPIs, services and scales have been hidden for confidentiality reasons.

6.3 Feedback and evaluation of the proposal

The feedback received from the head of SMO was that the SIAM Dashboard performed well over the two-week period. It was tested that the SIAM Dashboard was able to provide a comprehensive overview of the SMO's status on a high level in real-time, which was not possible before. The most important aspect according to the head of SMO was that the critical core processes (e.g. incident and major incident management) could now be monitored in real-time, and in case of emergencies the head of SMO would now be able to react immediately by escalating and assigning more resources in order to solve the situation accordingly. The head of SMO had no improvement points at the moment regarding the SIAM Dashboard.

The service managers also agreed that the SIAM Dashboard was able to deliver the required information and insights regarding the IT service and core process performance

to the service managers on an individual level. The service managers stated that they were now able to have a clear overview of their own service areas. According to the service managers, the most important aspect was that now all of the service managers had the same standardized KPIs for measuring IT service and core process performance. There was now a clear set of KPIs where the incident and change management are prioritized, supported with the most important KPIs from the other process areas. The service managers assessed that the number of KPIs was also optimal, there was not too many KPIs added to the same view making it cluttered, and there was not too few KPIs to be displayed which would make it too restricted in terms of being able to measure the IT service and core process performance in an optimal way. This also benefits the head of SMO, who is now able to compare the different service areas with each other on the high-level perspective, as the different service areas utilize the same KPIs for measuring IT service and core process performance. One of the key benefits from the SIAM Dashboard for the service managers is also that now the service managers do not have to use any time in searching for important information manually from the ITSM tool, as the information can be analyzed directly from the ITSM in real-time. The service managers had no improvement points regarding the SIAM Dashboard. Based on this information, improvements or adjustments will not be made to the case company SIAM Dashboard.

The SIAM Dashboard implemented in the case company was designed to balance the weaknesses the SMO currently had and increase the efficiency of the SMO, and according to the head of SMO and the service managers the SIAM Dashboard is able to serve the purpose it was designed for. The SIAM Dashboard and the KPIs chosen established a common understanding within the SMO regarding the IT service and core process success factors and standardized how the IT service and core process performance could be measured. The SIAM Dashboard provided a tool for the head of SMO and the service managers, which could be used for monitoring IT service and core process performance in real-time. It also removed the need for the head of SMO and the service managers having to manually search for the critical information from the ITSM tool.

The value the SIAM Dashboard brings to the case company consists of the following elements: The standardized KPIs and methods for measuring IT service and core process performance provide a clear foundation for measuring the SMO performance. Compared to the methods and practices used before, when the service managers were able to decide their own KPIs to be used in their own service areas, the overall performance

of different service areas was hard to define accurately, as they could not be compared directly to each other. By unifying the KPIs and creating a common understanding regarding the success factors of IT service and core process performance, the SMO is now able to easily process the information received from the SIAM Dashboard ensuring efficient day-to-day operations. Because the SIAM Dashboard provides all of the required information in real-time, especially regarding incident management and change management, the SMO is able to react to different emergencies and apply the required measures to these emergencies faster than before. This also decreases the potential negative impact on the business organization and therefore also reduces the potential costs that could be created by untreated incidents and problems. Compared to the methods used before, the head of SMO and the service managers are able to save time by using the SIAM Dashboard to search for the information which they had to search manually from the ITSM tool before the SIAM Dashboard was implemented. This creates more time for the head of SMO and the service managers for higher priority activities, and therefore increases the value received by the case company compared to the value invested to the SMO.

6.4 Summary of validation of the proposal

The SIAM Dashboard proposal was implemented in the case company and it was piloted over a two (2) week period by the head of SMO and the service managers. The head of SMO and the service managers utilized the SIAM Dashboard on a day-to-day basis in order to see if there were any flaws or improvement points to be found.

According to the head of SMO, the SIAM Dashboard was able to provide a comprehensive overview of the SMO's status on a high level in real-time, and incident and major incident management was now able to be monitored more efficiently than before. The service managers also gave good feedback on the SIAM Dashboard. The service managers stated that the SIAM Dashboard was able to deliver the required information and insights regarding the IT service and core process performance to the service managers on an individual level, and most importantly the service managers now had the same standardized KPIs for measuring IT service and core process performance. The head of SMO and the service managers had no improvement points for the SIAM Dashboard implemented in the case company at the moment. Based on this information, improvements or adjustments will not be made to the case company SIAM Dashboard.

According to the head of SMO and the service managers the SIAM Dashboard is capable to serve the purpose it was designed for. The SIAM Dashboard and the KPIs chosen established a common understanding within the SMO regarding the IT service and core process success factors and standardized how the IT service and core process performance could be measured.

From the value perspective, according to the head of SMO and the service managers, the standardized KPIs and methods for measuring IT service and core process performance provide a clear foundation for measuring the SMO performance. By unifying the KPIs and creating a common understanding regarding the success factors of IT service and core process performance, the SMO is now able to easily process the information received from the SIAM Dashboard ensuring efficient day-to-day operations. Because of the real-time and accurate information received by the SMO, it is now able to react to different emergencies and apply required measures faster compared to old methods. This decreases the potential negative impact to the business organization. Because the head of SMO and the service managers do not have to use time to manually search for the critical information from the ITSM tool, their valuable time can now be used for higher priority targets. This increases the value received from the SMO from the business organization perspective.

7 Summary and conclusions

This chapter first presents the executive summary of this thesis. Secondly, this chapter goes through the results and conclusions. And finally, this chapter discusses the final words regarding this thesis.

7.1 Executive summary

The business challenge regarding this thesis was that the case company was utilizing SIAM (Service Integration and Management) for managing their company's IT services and vendors, but there was no real-time information easily available for the managers working at the SMO (Service Management Office) regarding the IT service and core process performance. There was no standardized way for choosing or analyzing KPIs. Each of the service managers were choosing their own KPIs for measuring their services.

The objective of this thesis was to define a SIAM Dashboard for the case company, that would increase the ability to deal with the challenges the case company was currently facing without a real-time SIAM monitoring system.

The desired outcome for this thesis was to build a SIAM Dashboard with KPIs that could be used by the case company's head of SMO and service managers for measuring and evaluating the IT service and core process performance which are related to SIAM. The SIAM Dashboard was planned to be implemented into the ITSM tool utilized by the case company.

The SIAM Dashboard proposal in this thesis was built by using available knowledge (details in chapter 4) together with the SIAM Dashboard and KPI requirements defined together with the case company service managers and the head of SMO (details in chapter 5). The most important process areas within the SMO were defined together with the head of SMO and the service managers. They consisted of the following: Incident management, change management, request fulfilment, problem management and knowledge management. Because incident (and major incident) management and change management are so important by holding business critical aspects, the SIAM Dashboard would be highly focused on these two areas. The SIAM Dashboard proposal consisted of three different parts: Service Manager – Current State Dashboard (consisting of 12 KPIs), Service Manager – Last Month Dashboard (consisting of 19 KPIs), and SMO Dashboard (consisting of 11 KPIs).

This SIAM Dashboard proposal was approved by the case company service managers and the head of SMO, and it was implemented to the case company ITSM. The SIAM Dashboard proposal was piloted successfully over a two (2) week period. The SIAM Dashboard was utilized in the SMO's day-to-day operations, and the SIAM Dashboard was validated after the piloting period by the case company service managers and the head of SMO.

According to the head of SMO, the SIAM Dashboard was able to provide a comprehensive overview of the SMO's status on a high level in real-time, and incident and major incident management was now able to be monitored more efficiently than before. The service managers also gave good feedback on the SIAM Dashboard. The service managers stated that the SIAM Dashboard was able to deliver the required information and insights regarding the IT service and core process performance to the service managers

on an individual level, and most importantly the service managers now had the same standardized KPIs for measuring IT service and core process performance. The head of SMO and the service managers had no improvement points for the SIAM Dashboard implemented in the case company. Based on this information, improvements or adjustments were not required to be made to the case company SIAM Dashboard.

Because of the real-time access to accurate information regarding IT service and core process performance, the SMO is now able to react to different emergencies and apply required measures more efficiently compared to the former practices. The head of SMO and the service managers also no longer have to use time to manually gather the information required from the ITSM tool and their time can now be used for higher priority targets.

7.2 Thesis evaluation: Objective vs. Results

From the thesis evaluation perspective, the objective for this thesis was to define a SIAM Dashboard for the case company, that would increase the ability to deal with the challenges the case company was currently facing without a real-time SIAM monitoring system. This included defining and standardizing the SIAM KPIs to be used by the case company's head of SMO and the service managers within the SMO. The SIAM Dashboard would be used for measuring the IT service and core process performance which are managed by SMO (SIAM function).

It was concluded that the proposed SIAM Dashboard was suitable for the use of the case company. The SIAM Dashboard helped to deal with the challenges the case company was currently facing. The SIAM KPIs were standardized to be used within the case company SMO. The SIAM Dashboard and the KPIs both received positive feedback from the head of SMO and the service managers who tested the SIAM Dashboard proposal over a two (2) week period. This means that the validity of the SIAM Dashboard proposal is sufficient, and the objective was reached successfully. The SIAM Dashboard proposal was built based on a comprehensive collection of available knowledge and best practice gathered from trusted sources (ITIL® 2011, IT Service Management Forum). This means that the reliability of the SIAM Dashboard proposal is justifiable. The SIAM Dashboard provides the case company a foundation for measuring IT services and core process performance that is built based on the industry best practice.

7.3 Final words

This thesis gave a comprehensive insight into an industrial manufacturing company's IT service management. During this thesis, my knowledge regarding the key concepts around Service Integration and Management was increased, as well as my understanding on what it requires to be able to successfully conduct SIAM processes according to the best practice.

One of the most interesting aspects during working on this thesis was to see and understand in practice how the business organization creates the drivers for the IT, and how the IT realizes the value for the business organization.

The possibilities and the potential of IT are constantly changing and growing, the business people and the IT people are sharing same interests and goals, and the IT is recognized as one of the main value creators in the core of business.

It is clear that managing and executing optimal IT service management practices is one of the modern cornerstones of running a successful business, regardless of which industry the company is in.

References

Cannon, D. and Taylor, S. 2011. ITIL® Service Operation. Book. Axelos. 370 pages. [Accessed February 17th 2018]

Dorst, S. 2015. Who is the King of SIAM? White paper. Axelos. 19 pages. [Accessed January 17th 2018] URL: https://www.axelos.com/case-studies-and-white-papers/who-is-the-king-of-siam

Holland, K. 2015. An example ITIL-based model for effective Service Integration and Management. White paper. Axelos. 30 pages. [Accessed January 20th 2018] URL: https://www.axelos.com/case-studies-and-white-papers/an-example-itil-based-model-for-effective-siam

Holland, K. 2015. An introduction to Service Integration and Management and ITIL®. White paper. Axelos. 24 pages. [Accessed January 22nd 2018] URL: https://www.axelos.com/case-studies-and-white-papers/introduction-to-service-integration-management

Hunnebeck, L. 2011. ITIL® Service Design. Book. Axelos. 456 pages. [Accessed March 3rd 2018]

Lacy, S. 2011. ITIL® Service Transition. Book. Axelos. 347 pages. [Accessed February 25th 2018]

Palomäki, H., Heinonen, M., Youm, M. 2017. SIAM Dashboards. itSMF Finland. 46 pages. [Accessed March 13th 2018] URL: https://itsmf.fi/siam-sig/

Scopism. 2017. Service Integration and Management Foundation Body of Knowledge. Scopism Ltd. 238 pages. [Accessed January 19th 2018] URL: https://www.scopism.com/free-downloads/

Scopism. 2017. Service Integration and Management Professional Body of Knowledge. Scopism Ltd. 432 pages. [Accessed February 3rd 2018] URL: https://www.scopism.com/free-downloads/

Vromant, J. 2014. Quick guide to SIAM. Article. The ITSM Review. 3 pages. [Accessed February 2nd 2018] URL: http://theitsmreview.com/2014/09/siam/

Appendix 1 – SIAM Knowledge

This appendix elaborates SIAM as a concept and describes the knowledge relevant regarding the concept.

8 Overview of SIAM

The IT landscape has become extensively more complex compared to the genesis of ITIL: The business dependency on IT is constantly growing, business is more demanding and there are high expectations of guaranteed performance, IT refresh and innovation cycles are shorter, sourcing and multi-sourcing are no longer separate fields, and at the same time, there is an expectation of agility and advancements from contracted partners. SIAM is a recognizably evident adaption of the ITIL best practice framework that pursues to provide the key to the effective management of the multi-provider model in existence in most modern companies. The key to success is the ability to handle the challenge of cross-functional, cross-process, cross-provider integration while finding an efficient approach for managing this delivery environment and assuring value-based outcomes. (Dorst, S. 2015)

SIAM is an adaptation of ITIL that focuses on coordinating internal and external suppliers and their services in a cost-effective way in order to achieve the end-to-end service levels required to support the goals of the business functions in an organization. (Vromant, J. 2014) SIAM is not a process. It is a service capability and set of methods in a body and approach that base on, build up, and complement every part of the ITIL practices. SIAM consists of approaches for supplier coordination, integration, collaboration, interoperability and delivery. This forms a foundation where all parties understand their role, responsibilities, context and are empowered to deliver, as also being held accountable for actions and outcomes. (Holland, K. 2015)

The goal for SIAM is to give a single point of visibility and control for the service management and delivery of all services in use, provided by the suppliers. This is achieved by taking end-to-end responsibility for the performance and delivery of services to the consumers, coordinating the delivery, integration, and interoperability across multiple suppliers and services, assuring supplier performance, making sure that the services

meet the business needs efficiently, and by providing the required governance over the suppliers on behalf of the business. (Holland, K. 2015)

The initial service and supplier landscapes are going through a significant change and the service management functions that were set up to manage these are no longer optimal for that use. This requires a shift in the way that these services and their suppliers are managed. (Holland, K. 2015)

There are many drivers for the adoption of SIAM focused models, examples are shown in the Figure 26 below.

Drivers for adopting SIAM
The move from using a single-sourced prime contactor approach to using disaggregated multi-supplier contacts.
Increasing use of commodity services such as IaaS and SaaS causes challenges in achieving consistency through imposing ways of working on suppliers.
Within larger organizations, there are often several services that are similar, but they are managed in different ways by different teams.
Pressure between suppliers who want to commoditize and optimize their services and customers who want services customized to their needs, but integrated with other services they use as well.
The necessity to make best use of a organization's resources by utilizing standardized models focusing on adding value.
Increasing quality expectations from consumers within continuing budget constraints.
The need to integrate certain services selected by business users while maintaining overall quality and performance.
Inconsistencies between the service target achievement of individual component services and the customer's experience of the overall service received.
The flexibility required to support developing business and IT supply models.
The developing customer/supplier landscape of more specialized service providers and technologies, multiple delivery channels, diversity of customer communities, and a fast rate of change to requirements.
The move from supply chains to supply networks for the delivery of services.

Figure 26. Drivers for adopting SIAM (Holland, K. 2015)

As shown in the figure above, when there are many different services becoming commoditized in an IT environment and where multiple vendors are required to work together in order to provide business critical services for the customer, many organizations are using more time on the management of suppliers than actually delivering services. The

organizations are considering SIAM to effectively manage the end-to-end picture of service provision, coordinate the actions of multiple service providers, and provide a single source of truth regarding service performance. SIAM is also considered as a powerful tool in developing new services and strategies, optimize delivery through people, processes, tools and suppliers, and ensure smooth performance of daily operations, enabling organizations to focus on more progressive activities. (Scopism. 2017)

8.1 SIAM performance

High performing SIAM implementation is dependent on the co-operation and involvement of the suppliers and the business. Effective SIAM pursues to combine the benefits of best-of-class based multi-sourcing of services with the simplicity of single sourcing, minimizing the risks and threats which are common in multi-sourced approaches and hiding the supply chain complexity from the consumers of the services. In cases where policy and execution can no longer be fully determined by a single authority, the SIAM practices are used for steering the development of supply chains into supply networks. (Holland, K. 2015)

When executed successfully SIAM can be enabled to reach its full potential, but without competent governance, coordination and collaboration, there will be service performance concerns including: A lack of transparency for the end-to-end service, incomplete awareness and inability to report on end-to-end service performance, no control of service levels across the end-to-end service, and service performance that is not aligned to business requirements. (Scopism. 2017)

With the SIAM multi-provider model, providers may each be eager to deliver services, but they are not always working as effectively as they could when viewed from a customer or end-to-end perspective. The challenge is that issues fall into the gaps between the service provider modules, often leading to finger pointing, degradation of relationships between the providers and eroding customer confidence. This creates a demand for more defined and cohesive control structures that allow managing the service providers in a consistent and efficient way. The target is high performance across a portfolio of services that meets the needs of the users of the services. This is where the need for SIAM comes from and the challenge to design such a structure begins. (Dorst, S. 2015)

8.2 SIAM structure

The SMO which is the SIAM function, operates between the suppliers and the business which supports and enables the integration of the services offered by multiple (internal and external) service providers. (Vromant, J. 2014)

There is no single ‘best’ SIAM model which would fit for every organizations’ needs. Each organization develops its own SIAM model based on the organization’s requirements, the services that are in scope, and the outcomes that are desired. As there are variations between different SIAM models, they still share common characteristics, as shown in the Figure 27 below. (Scopism. 2017)

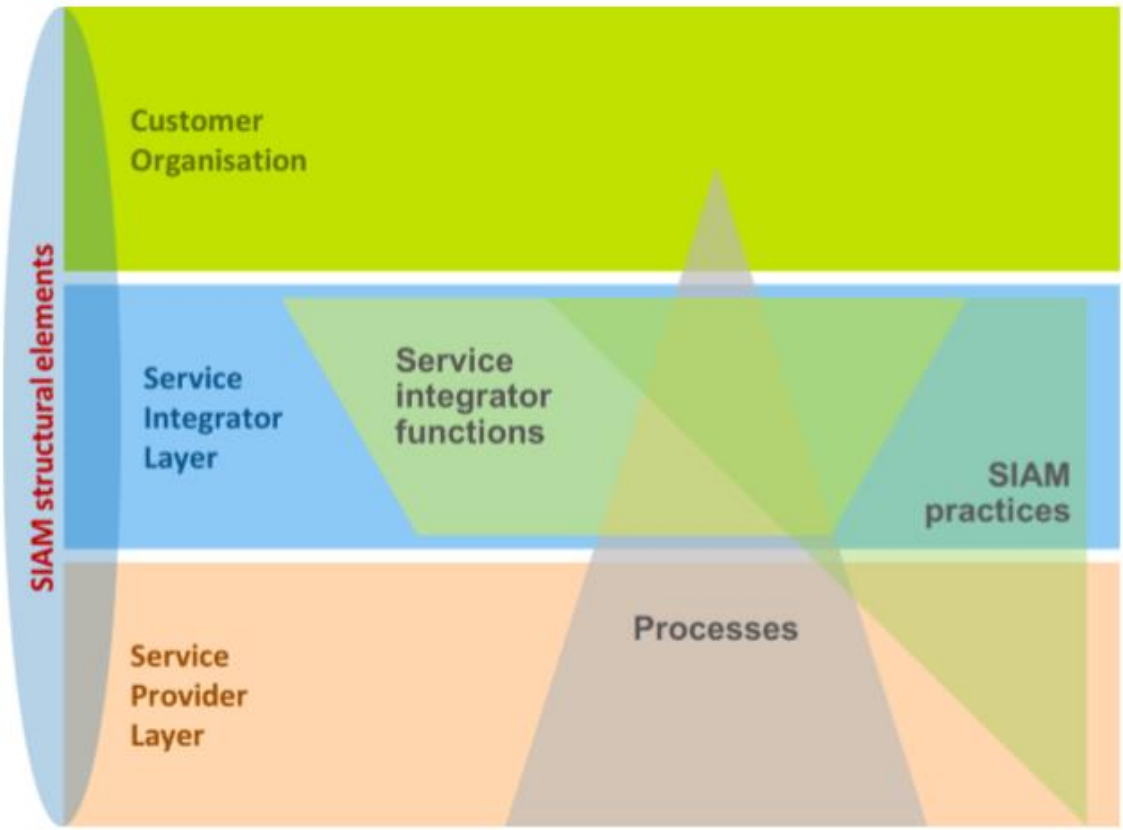

Figure 27. A high-level SIAM model (Scopism. 2017)

As shown in the figure above, the SIAM structural elements consist of three main layers: The customer organization layer, the service integrator layer, and the service provider layer.

The customer organization layer typically consists of business units such as human resources, finance, sales, and customer organization's own internal IT function who are the different consumers of services. The organization typically also have their own customers who consume their products and services. The customer organization is the owner of the contractual relationships with external service providers and external service integrators. The customer organization holds retained capabilities, which are functions responsible for architectural, strategic, business engagement and corporate governance actions. These functions typically continue working under the direct control and ownership of the customer organization. The retained capabilities also include all responsibilities and accountabilities that must remain on the customer side for regulatory or legislative reasons. Some examples of retained capabilities are: Enterprise architecture, policy and standards management, procurement, contract management, demand management, financial and commercial management, service portfolio management, corporate risk management, and governance of the service integrator; based on achievement of business outcomes. The service integrator layer is independent from the retained capabilities, also in cases where it is internally sourced. (Scopism. 2017)

In the SIAM ecosystem, the service integrator layer is where the end-to-end service governance, integration, management, assurance and coordination is conducted. The focus of the service integrator layer is on implementing an efficient cross-service provider organization, ensuring that every service provider is contributing to the end-to-end service. The service integrator layer provides operational governance over the service providers and has a direct relationship with the customer organization and service providers. There can be one or more organizations, including the customer organization, providing the service integrator layer. In cases where the service integrator layer is provided by several organizations, it is important that it is still seen as a single logical service integrator. The service integrator layer can consist of one or more teams of people. (Scopism. 2017)

There are multiple service providers inside a SIAM ecosystem. Each of the service providers are responsible for the delivery of one or more services to the customer. The service provider is responsible for managing the different components that are used to deliver its services and operating its own processes. The service providers can be a part of the customer organization or they can be external to it. An internal service provider is a team of people or a department which is a part of the customer organization, the performance is generally managed by utilizing agreements and targets. An external service

provider is an organization which is not a part of the customer organization, the performance is generally managed by utilizing service level agreements (SLAs) and a contract with the customer organization. Some examples of the services that are provided by the service providers in a SIAM model are: Desktop services/end user computing, data center, hosting, security, network/LAN/WAN, cloud services, printing services, voice and video (VVI), application development, support and maintenance, and managed services. If the customer organization retains its own internal IT capability, this would still be seen as an internal service provider, which is governed by the service integrator. For defining the services' importance to the customer organization and the approach on how to govern and assuring certain services, it can be helpful to categorize the service providers inside a SIAM ecosystem. There are three common categories which can be used for categorizing service providers in a SIAM ecosystem: Strategic service provider, tactical service provider, and commodity service provider. The SIAM is applied to all of the categories, but it is important that the relationship and the amount of control required are defined individually. (Scopism. 2017)

8.3 SIAM component model

SIAM is a set of different capabilities, which all have their own processes, functions, activities, and principles. A SIAM model groups these capabilities into related components in a logical manner. The SIAM provider is not able to operate in isolation, it also requires specific support and involvement from the business organization in different areas, where the input from the business is required for different reasons in different situations in order to be able to conduct an effective SIAM model. These typically include areas such as: Enterprise architecture, program management, project management, systems integration, commercial procurement, and business analysis. (Holland, K. 2015)

One of the generally used examples of a SIAM component model is the SIAM Enterprise Model, which was first created in 2012 and used by the UK Public Sector. This model and its variations have been universally adopted in different UK public sector organizations. There are many different SIAM models currently in use in different organizations, but many of them consist of a similar set of components. (Holland, K. 2015)

An example of the UK Public Sector's SIAM Enterprise Model is shown in the Figure 28 below.

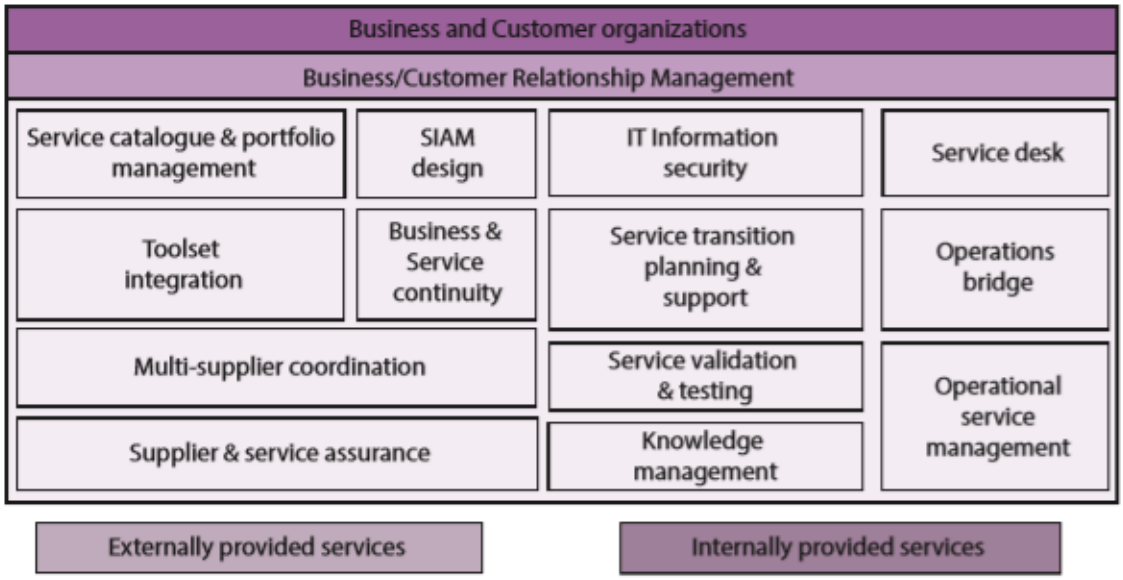

Figure 28. UK Public Sector's SIAM Enterprise Model (Holland, K. 2015)

As shown in the figure above, there are many various components in the SIAM model and the delivery of each component can be sourced from the business organization or externally, or from both in combination. The sourcing choice typically depends on the following aspects: The existence of SIAM capability in the business, the maturity and capacity of the SIAM capability, size and complexity of the business, services and the supplier landscape. The SIAM Enterprise Model consists of individual SIAM components where each of the components focus on a specific related processes and activities. (Holland, K. 2015)

As SIAM models are often defined as a group of certain components and processes, but it is important to remember that it also requires a lot consideration on people, partners and products as well. The Figure 29 below demonstrates what process areas and capabilities an effective SIAM model consists of. (Holland, K. 2015)

Process areas and capabilities of effective SIAM models
Process integration across multiple suppliers.
Multi-supplier coordination (change/release/capacity/incident/problem, etc.).
Supplier performance management against SLAs and OLAs.
Supplier management against contract requirements.
Business Relationship Management.
Service level management of individual and end-to-end services.
Supplier and service assurance (audits, assessments, KPIs, etc.)
Collaboration between multiple suppliers.
Common standards/policies/templates definition and application.
Service introduction onboarding of new and changed services and suppliers, and the related offboarding of previous services and suppliers.
Service reporting consolidation of service quality and performance reports.
SIAM design of changes to the SIAM model and for new services coming under the SIAM model.
Service catalogue and service portfolio creation and management.
Toolset integration between suppliers and SIAM toolsets.
Testing of integrated solution.
IT information security support assuring and managing security.
Release management of integrated solution.
Strategy for services and sourcing.
Innovation culture and management.

Figure 29. Process areas and capabilities of effective SIAM models (Holland, K. 2015)

In addition to the figure above, some SIAM models also include a centralized Service Desk function, which deals with the incident management, service request management, and access management. This is because the Service Desk function can also be considered as a service that can be provided by a separate service provider. (Holland, K. 2015)

9 Core SIAM components

There are set of components that are generally referred as the “Core SIAM”, because they are common to all SIAM models and form the foundation of what a SIAM provider is responsible of. (Holland, K. 2015)

9.1 SIAM Design

The SIAM Design component conducts the design of SIAM processes, policies, templates, information exchanges, metrics, structures, and service level models that are necessary for SIAM. It is also responsible for activities such as designing the impact assessments of new services against the SIAM model. The SIAM Design focuses on the creation, updating, and improving the SIAM operating model. The SIAM Design component consist of following processes: Design coordination, availability management design, and capacity management design. (Holland, K. 2015)

9.2 Service Catalogue and Portfolio Management

The Service Catalogue and Portfolio Management component focuses on the creation and management of the service catalogue and portfolio management which are used by the SIAM provider, the suppliers, and the business. The catalogues' principles, methods and techniques are based on the ITIL Service Strategy and Service Design best practice. The component consists of following processes: Service portfolio management and service catalogue management. (Holland, K. 2015)

9.3 Toolset integration

The Toolset integration component conducts the selection, implementation, and configuration of appropriate SIAM tools to support the SIAM model. The Toolset integration focuses on the integration of the toolsets utilized by the SIAM provider and the suppliers. The Toolset integration component consists of following tools: Tools to support the execution of processes within the SIAM provider, service alerting and monitoring tools, decision support systems, diagnostic tools, discovery tools, security tools, reporting tools, and analytical tools. (Holland, K. 2015)

9.4 Multi-supplier coordination

The Multi-supplier coordination component conducts coordination of the process execution over multiple suppliers, ensuring a harmonized operation of the services for the users. The component also provides the capability to recognize the potential impacts of one supplier's activities to another supplier's services, this is to predict and prevent any adverse situations. The Multi-supplier coordination component consists of following processes: Change management for changes that affect multiple suppliers, major incident management for major incidents involving multiple suppliers, problem management for problems involving multiple suppliers, release planning and release conflict resolution, capacity management providing the demand to all affected suppliers, innovation, and continual service improvement. (Holland, K. 2015)

9.5 Business and service continuity

The Business and service continuity component is responsible over the actions which are required in order to create and maintain the integrated business and continuity plans. This includes also the design, implementation and improvement of processes, creation, maintenance and testing of the integrated continuity plans, testing, and maintenance. The business and service continuity component consists of following processes: IT service continuity management, and business continuity management. (Holland, K. 2015)

9.6 Operational management SIAM components

The operational management SIAM components are concerned of the operational management instead of governance. Including them in the SIAM model help the standardization and economies of scale. The capabilities of the operational management can be provided to internal and external suppliers. (Holland, K. 2015)

9.7 Service Desk

The service desk function is provided for the SIAM model by this component, and it is usually also the only service desk for all services. In some SIAM models used by organizations, all of the incidents are reported to the service desk. In cases where the incidents cannot be resolved, they are escalated to the appropriate supplier by the service desk. This provides a single point of contact, but it adds an additional handoff to the process between the user and the suppliers, which is the reason why it may not be the most optimal solution. The other solution is to allow users to report the incidents directly to the supplier's service desk, but this can only function in cases when the suppliers of the services are clear to the user. It is important that the incident management and the event management processes are completely integrated with other SIAM components in order to function properly. The Service Desk component consists of following processes: Incident management, request fulfilment, and access management. (Holland, K. 2015)

9.8 Operational Service Management

The Operational Service Management component gives a service management capability for the Service Operation and Service Transition processes. While other SIAM components provide the governance, coordination and integration capabilities that are required in SIAM, the Operational Service Management component provides the operational capabilities. The Operational Service Management component consists of following processes: Incident management, problem management, change management, release and deployment management, service validation and testing, service asset and configuration management, capacity management, availability management, and IT service continuity management. (Holland, K. 2015)

9.9 Operations bridge

The Operations bridge component gives an IT operations function which will perform activities such as service monitoring and alerting, housekeeping, event management,

health checks, and batch management. The Operations bridge component consists of following processes: IT operations control, technical management, event management, and incident management. (Holland, K. 2015)