

IT Transformation in Large Technology Organization- Case Telco's Fault Management

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<p>A program of renewing the global networks has been initiated in TeliaSonera and as a part of it also the current local network management IT solutions will be replaced with common and modern IT solutions in IT transformation program.</p> <p>The author of the thesis works in TeliaSonera Broadband Technology Solutions IT organization as an IT owner of the network management systems, so the topic of the thesis is directly related to working environment.</p> <p>The empiric part of the thesis includes the pre-study of the Common Fault Management project. The project’s deliverable will be the common IT solution which replaces the current local legacy IT solutions. The project set-up specification is created in initiation phase of the project and it is included as an attachment to the thesis. The author has been the project manager for the pre-study phase. The professional project manager will continue from the planning phase to the end of the project.</p> <p>The work has been done by collecting existing information related to the project and IT transformation from the internal and external stakeholders by interviewing, emailing and exploring the TeliaSonera intranet. The brief inquiry study to IT managers was carried out in December 2013 and the thesis has been written in Spring 2014. The learnings from the Master Programme; change, project and IT service management is applied in the thesis.</p> <p>The IT transformation project is addressed from the change viewpoint; comprehending both business processes and IT solutions. The objective of the study is to improve the success of the IT transformations by bringing out more of the impacting key success factors of the IT changes.</p>	
<p>Keywords Application consolidation, Change management, IT service management, IT transformation, project management</p>	

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Abbreviations

BSS	Business Supporting Systems
BTS	Broadband Technology Solutions
CMDB	Configuration Management Database – ITIL term for repository of IT assets
CMMI	Capability Maturity Model Integration
COBIT	Control Objectives for Information and Related Technology Framework
COTS	Commercial of the Shelf – an alternative to In-house-developed software
DP	Decision Point
FCAPS	Fault, Configuration, Accounting, Performance and Security – the five functions of network management systems according to ITU
FM	Fault Management, Sub-part of Service Assurance
FRA	Försvarets radioanstalt, National Defence Radio Establishment
GNSV	Graphical Network Status View
IMC	Incident Management Center, Network Operation Center of TeliaSonera Broadband Services
IT	Information Technology
ITIL	IT Infrastructure Library – commonly used IT framework
ITU	International Telecommunications Union
MTS	Mobility Technology Solutions
NE	Network Element
NFV	Network Functions Virtualization
NGOSS	Next Generation Operations Systems and Software, TM Forum’s technical specifications for business management of communications service providers, currently called Framework
NGSA	Next Generation Service Assurance Architecture

OSS	Operation Supporting Systems
PM	Performance Management, Sub-part of Service Assurance
QoE	Quality of Experience
QoS	Quality of Service
RAS	Reliability, Availability and Survivability
RCA	Root Cause Analysis
SA	Service Assurance, sub-part of OSS
SDN	Software-defined Networking
SIA	Service Impact Analyzer
PMO	Program Management Office
PROMO	Project Governance method used in TeliaSonera
RFI	Request for Information
RFP	Request for Proposal
T2M	Time to market, length of time taken in product development process
TAM	The Application Framework, sub-component of Frameworkx
TELCO	Telecommunications Company
TOGAF	The Open Group Architecture Framework
TS	TeliaSonera
TT	Trouble Ticketing, sub-part of Service Assurance
V MOST	Vision, Mission, Objectives, Strategy, Tactics

1 Introduction

TeliaSonera is an international network service provider, mobile network operator and telephone company. “TeliaSonera provides network access and telecommunication services that help people and companies communicate in an easy, efficient and environmentally friendly way.” (Teliasonera.com, 2014.)

Broadband Technology Solutions (BTS) is a technology unit for business area Broadband Services which comprises operations in Sweden, Finland, Norway, Denmark, Lithuania, Latvia, Estonia and international carrier operations. The biggest Units in BTS are IT, Program Management Office (PMO), Networks, Incident Management Centre (IMC) and Applications. IT Unit is the owner of IT Solutions of Business Area Broadband Services and responsible of the whole life cycle management of the IT systems.

The big reorganization has been executed in TeliaSonera during the spring 2014 and its consequences to the organization structure and responsibilities have not been taken into account in this thesis.

Due to merger of Telia and Sonera in 2002 the company has still plenty of incumbent legacy IT systems and there are growing needs for development of the whole IT infrastructure. The company has initiated the IT transformation program together with network technology renewal program for development of the all technology platforms. The scope of the IT transformation program is the total IT of TeliaSonera BTS including all three main areas; Customer Channels, Business Support Systems, and Operational Support systems (figure 1).

IT needed to interact with the customers and the network

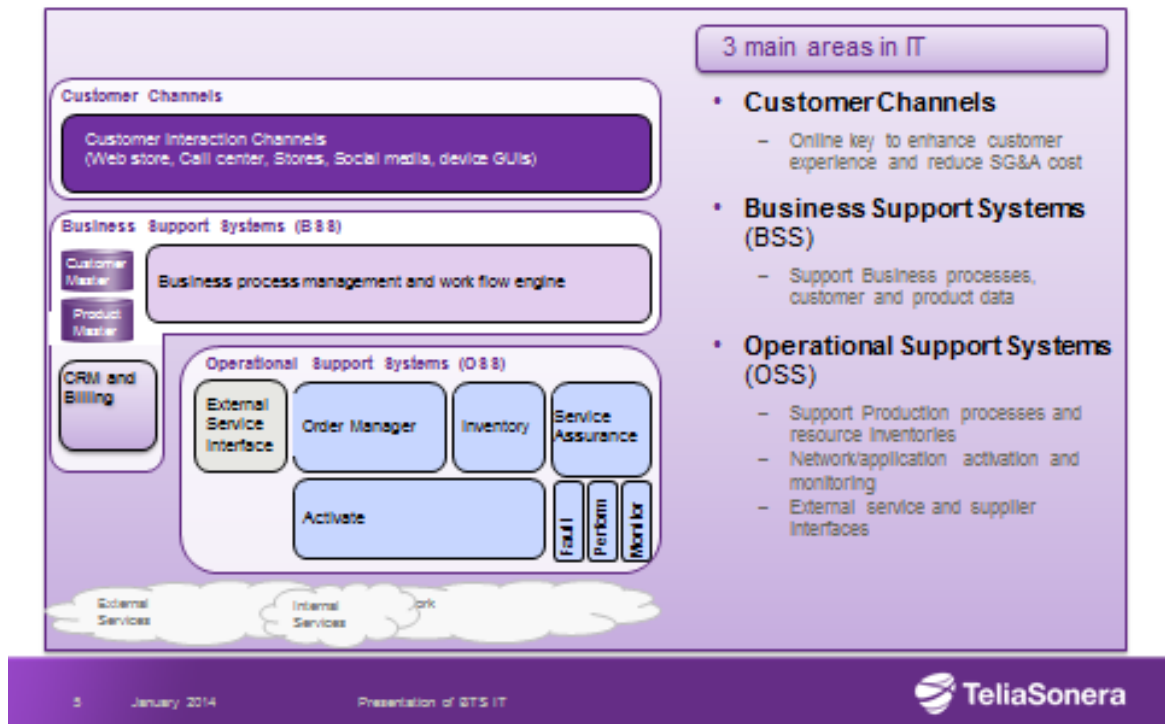


Figure 1. TeliaSonera BTS IT (Vepsäläinen, 2014)

The total amount of IT systems in TeliaSonera Nordic and Baltic area (both Broadband and Mobility business) is about 1600 of which about 400 business support systems (BSS), about 400 operational support systems (OSS) and about 200 customer channel systems. The rest 600 applications are various non-traditional IT systems which cannot be categorized (Vepsäläinen, 2014).

According to TeliaSonera intranet definition the Customer Channels systems consists of IT systems and services supporting online customer interaction which covers online services for selling, customer support, customer self-management, customer order, interaction & composition, distribution & request and online channel infrastructure as sales portals.

Business support systems (BSS) are the IT solutions supporting directly the business processes as product and service management, order management, sales, billing etc.

Operational support systems (OSS) consists of IT systems and processes to monitor and control networks, value added services and IT infrastructure for efficient production operations. They cover service & resource assurance, resource implementation, order fulfillment and activation, network & service inventories, planning & optimization and network element managers.

The Common fault management is a project of IT transformation program. The main deliverable of the project is a common fault management solution for TeliaSonera Broadband Services. The pre-study phase of the project constitute a case study part of the thesis which is contemplating IT transformation from the viewpoint of achieving actual and sustainable change in the organization. The author of the thesis is acting as a project manager for the pre-study phase of the project. From the next planning phase the project manager responsibility will be forwarded to professional TeliaSonera project manager. The project phases are introduced in chapter four.

TeliaSonera business is very technology dependent as company acts as a network service provider (NSP) both in fixed and mobile. The examination goes through the business processes related to service assurance, process frameworks applied and service assurance processes implemented, supported and executed with the fault management IT solutions which are the subject of the case study part.

The high level principles for successful transformation have been defined already in IT (figure 2) and they will be taken into account in the mentioned IT transformation Program. The high level principles constitute a starting point to the IT transformations (Vepsäläinen, 2014).



Figure 2. Key principles of Successful IT transformation (Vepsäläinen, 2014)

Radical business simplification means that the change covers everything; products and services, processes and also IT systems. Green field approach means a revolutionary change where the transformation lacks of any constraints from the prior legacy systems and related processes. Show success early means shortening the duration of the projects radically. Imperfect solution mindset means prioritizing fast progress of the project before perfect solution. Out-of-the-box functionality means using the standard commercial software. It is also called commercial of the shelf, COTS, in comparison with home tailored, so called bespoke software. No requirements approach principle is accepting the functions already included in COTS application compared to never ending requirement management of the constantly coming detailed user needs. The last key principle about combining the transformation and legacy maintenance means that the same vendor is responsible both new replacing system implementation and the old system phase-out.

The business value can be considered as differentiation, simplification or execution mastery. Simplification means simplifying and standardizing and componentizing the internal products, processes and systems (Bhatia, 2012, 5). TeliaSonera is striving for simplification by doing the transformations.

1.1 The thesis objectives and research questions

The objectives for the thesis were to describe the service management environment in general level, collect the existing input for the IT transformations from the organization and research the impacting internal and external factors for the IT transformation success. The common fault management project is represented as an example in the IT transformation program. The research questions are:

- what are the success factors for the IT transformation
- what are the risks for the IT transformation
- what are the drivers for the IT transformation
- what are the constraints for the IT transformation?

2 TeliaSonera Processes

According to TeliaSonera intranet process pages the purpose of processes in TeliaSonera is to create value for the customer in the most cost efficient way. The customers want that services and products produced by TeliaSonera are reliable and simple to use and that they have the functionality and features which are required. The customers should perceive a good balance between what they get and what they pay. The information of the services and products must be easily found and the services and products must be easily bought and at right time. The faults must be fixed fast and the invoicing must be understandable and correct.

Processes exist also for internal reasons. They are the key to performing work across the departments and avoiding functional silos in order to deliver value to the customer end-to-end. The processes help to keep clear responsibilities and interfaces between organizational units. Avoiding the overlapping effort and multi-fold working are also the rationale for processes. Documentation and IT implementation support the performance of the processes and the continuous improvement is used for improvement and correction of malfunctions.

2.1 Process Map

The processes are depicted in the process map (figure 3). On top there are the customer touch points which are showing how the customer interacts with TeliaSonera and creating the interface towards the processes. The other processes are explained more detailed in next chapter.

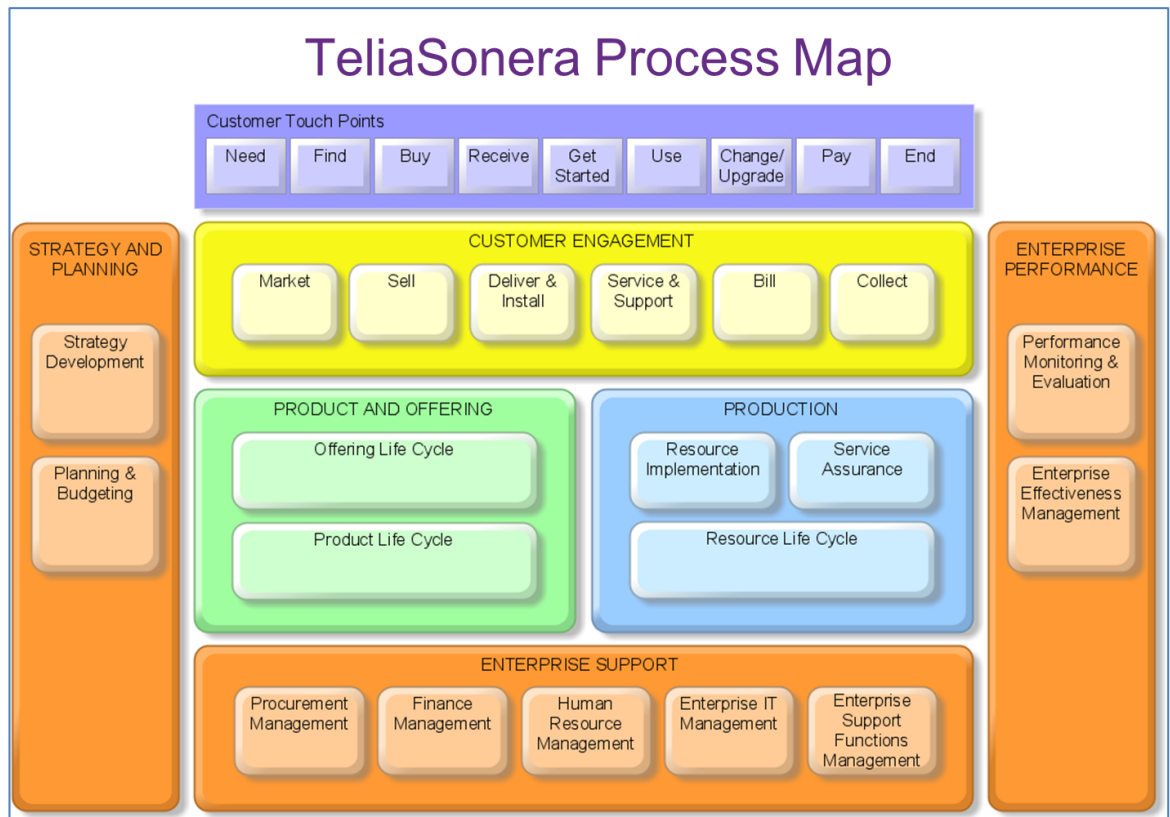


Figure 3. Teliasonera Process Map

2.2 Process Accountabilities

Country level business units are accountable of the customer engagement processes. The purpose of customer engagement is to ensure world class customer experience and loyalty. Corporate level product and offering processes are in accountability of product management. Corporate level group functions are accountable of strategy and planning, enterprise performance and enterprise support processes. The company's technology solutions units (BTS in Broadband Business Area and MTS in Mobility Business Area) are accountable of production processes. Service assurance process area where also the fault management systems are used is depicted in blue production box in process map.

2.3 Process Types

The processes are categorized to different types. Operational processes are resource implementation and service assurance in production and also all customer engagement processes. Life cycle processes are all product and offering processes such as resource

life cycle process in production box. Strategy and planning, enterprise performance and enterprise support are categorized as enterprise support type.

2.4 Life Cycle Processes

All life cycle processes have the same structure because they need to interact with each other. They have three parts; development, maintenance and retirement and the strategy and planning part which act a kind of steering process towards the other parts. For instance in the strategy and planning part of product life cycle makes plans about which project should be run in the development part. The product that has been developed needs to be maintained during the product lifetime, and then in the end the product has to be closed down in retirement part. Resource life cycle is activated when the IT or the networks need to be changed.

2.5 Process Frameworks and Their Applications

TeliaSonera processes relate to the international standards. The two frameworks which are in common use are eTOM and ITIL. TeliaSonera's strategy is to have its own process map but it has been structurally based on eTOM and sub-processes and process elements have been incorporated into process map from both of these frameworks.

eTOM is a traditional process framework for Telcos and ITIL is widely used among IT Service Providers so there have been needs for bringing these two frameworks together and creating the capability to apply ITIL best and good practice through eTom. TeliaSonera has also customer demands for use of ITIL framework.

2.5.1 Business Process Framework eTOM

TM Forum is a global, non-profit industry association for telecommunication service providers. The OSI/Network Management Forum was founded in 1988 by eight companies Amdahl, AT&T, British Telecom, HP, Northern Telecom, Telecom Canada STC and Unisys. The name was later changed to TM Forum from Tele Management Forum. In 2000, the Next Generation Operating Support System (NGOSS) program was launched, with a mission to make 'plug and play' interoperability a reality. Over the

next eight years, there were seven releases of the NGOSS frameworks which included the Business Process (eTOM), Information (SID) and Application (TAM) frameworks. The abbreviation of eTOM comes from Enhanced Telecom Operations Map (Tmforum.org, 2014).

As shown in the figure 4 below there are three main process areas Strategy, Infrastructure & Product which covers planning and life-cycle management, Operations covering operational management and Enterprise Management covering business support processes. Processes are structured hierarchically and they are decomposed in deeper levels. Also the linkages or flows between the processes are defined as also process dynamics called behaviors. eTOM provides common terminology and structured catalogue of process elements which can viewed more and more detail because of a level structure.

The graphic representation of an eTOM model consists of rows and columns. The intersections of these rows and columns point out to specific processes. The topmost row denotes the customer facing activity i.e. marketing while the bottom most row indicates the supplier facing activity and the support activities. In-between there are layers for service (the technical facing side of the product) and resources (i.e. networks and IT). In this manner the eTOM map tries to indicate the whole value chain.

The eTOM map is divided into two halves, the left side is called strategy, infrastructure & product (SIP) and the right side is called operations. The idea is that the left side support the processes on the right side as they are the true “real time” processes that interacts with customers, offerings, products, resources and suppliers.

There is also at the bottom a grouping called enterprise management, which contains supporting processes needed to run a company. These processes are not special for telecom service providers, they can be found in any company of larger size (Tmforum.org, 2014).

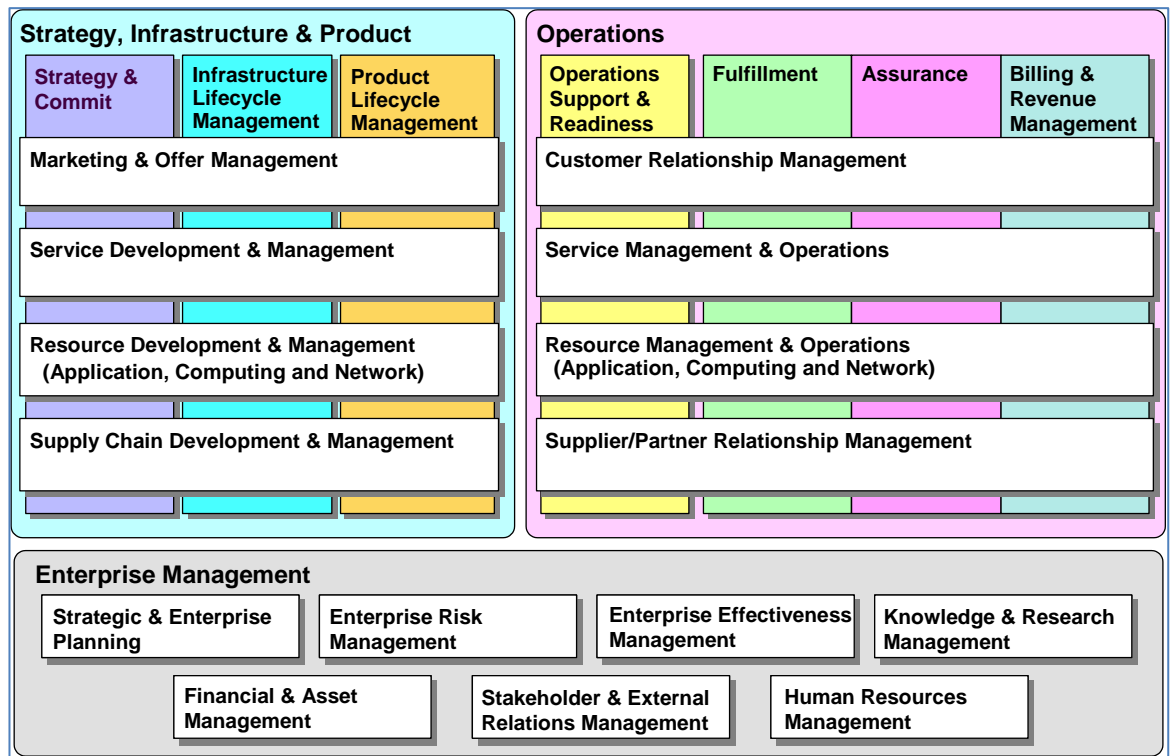


Figure 4. Business Process Framework decomposition hierarchy (Tmforum.org, 2014)

Seven vertical level 1 end-to-end process groupings are shown on the map. These vertical groupings can be thought of as a lifecycle when you view them from left to right in the schematic in the map. The horizontal groupings represent major programs or functions that cut horizontally across an enterprise's internal business activities (Tmforum.org, 2014).

TeliaSonera's process maps relation to eTOM is illustrated in figure 5 below.

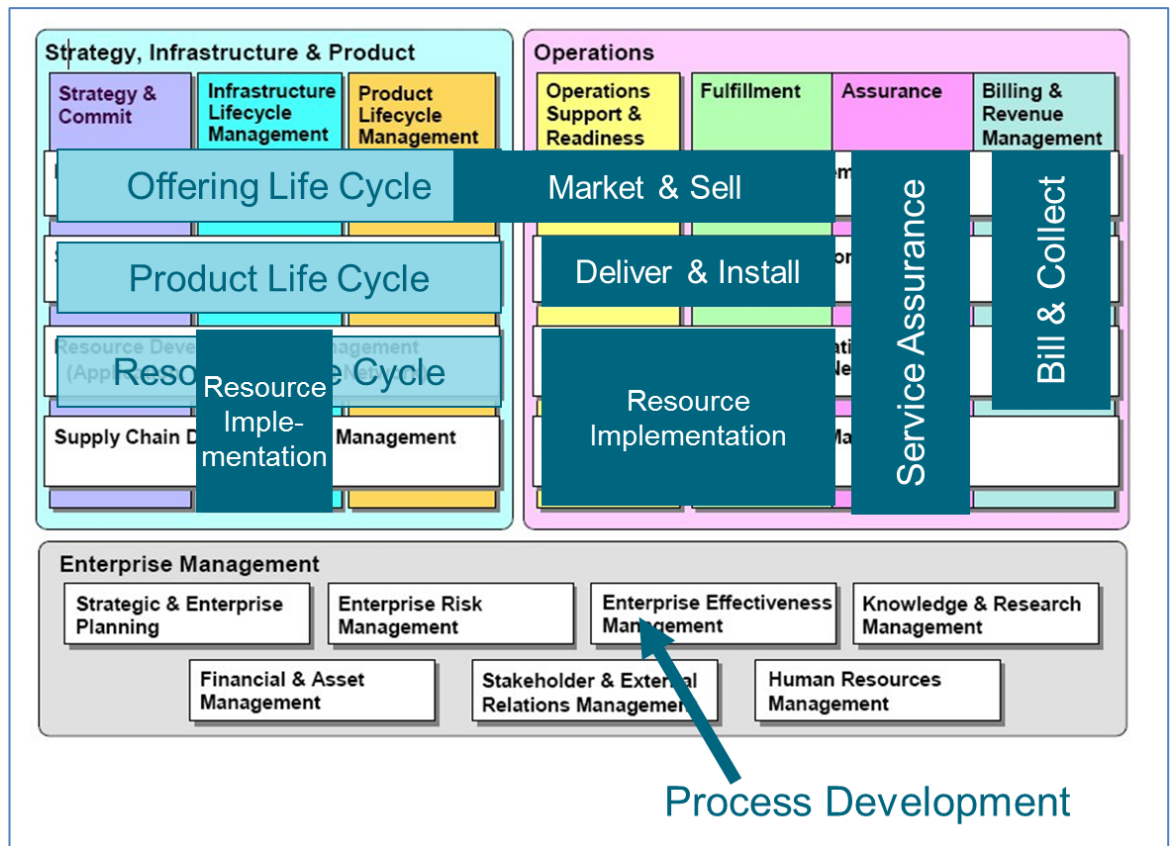


Figure 5. TeliaSonera process relation to eTOM (Nilsson, 2014).

Part of TeliaSonera processes can be mapped on level 1 of eTOM map.

2.5.2 ITIL

IT Infrastructure Library aka ITIL was published in 1980's in United Kingdom in the era of Margaret Thatcher. The government determined that the level of IT service quality provided to them was not sufficient. For the result of these unsatisfying circumstances Her Majesty's Stationary Office on the behalf of the Central Communications and Telecommunications Agency subsumed within the Office of Government Commerce (OGC) was told to develop a framework for efficient use of IT resources.

ITIL is a process framework for IT Service Management best practices and it is widely adapted and adopted globally. The popularity of ITIL grew in 1990's and a user forum, IT Information Management Forum (ITIMF), was established in 1991. The user forum changed its name later to IT Service Management Forum (itSMF). The user forum has

nowadays members worldwide and ITIL's popularity continues its growing (The Official Introduction to the ITIL Service Lifecycle, 2007).

OGC announced version 2 in 1991 and the current version 3 was announced in 2004 and published in 2007. This version adopted more of a lifecycle approach to service management with greater emphasis on IT business integration. The ITIL version 3 consists of Official Introduction book and five core books covering the service lifecycle; Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement (figure 6).

The sixth book, The Official Introduction, provides an overview of the five core books and all of the books are complemented by extensive additional publications and supporting web services with study material among others (Cartlidge, Hanna, Rudd, Macfarlane, Windebank, & Rance, 2007, 8-10).



Figure 6. The ITIL-based Service Lifecycle Model (Ictstandard.org, 2010)

As mentioned, ITIL version 3 adopts a greater business focus for IT because IT assets are integrated with the business strategy and business outcomes. ITIL version 3:

- is positioned as a practice in the IT services business
- uses a service lifecycle that engages across, and beyond, the enterprise
- allows a synergy with other best practices e.g. COBIT, CMMI.

The books in ITIL V3 describe the Service Lifecycle:

- Service Strategy: Policies and objectives
- Service Design, Transition, & Operation: Progressive stages that represent change & transformation, new and changed services
- Continual Service Improvement: Learning and improvement.

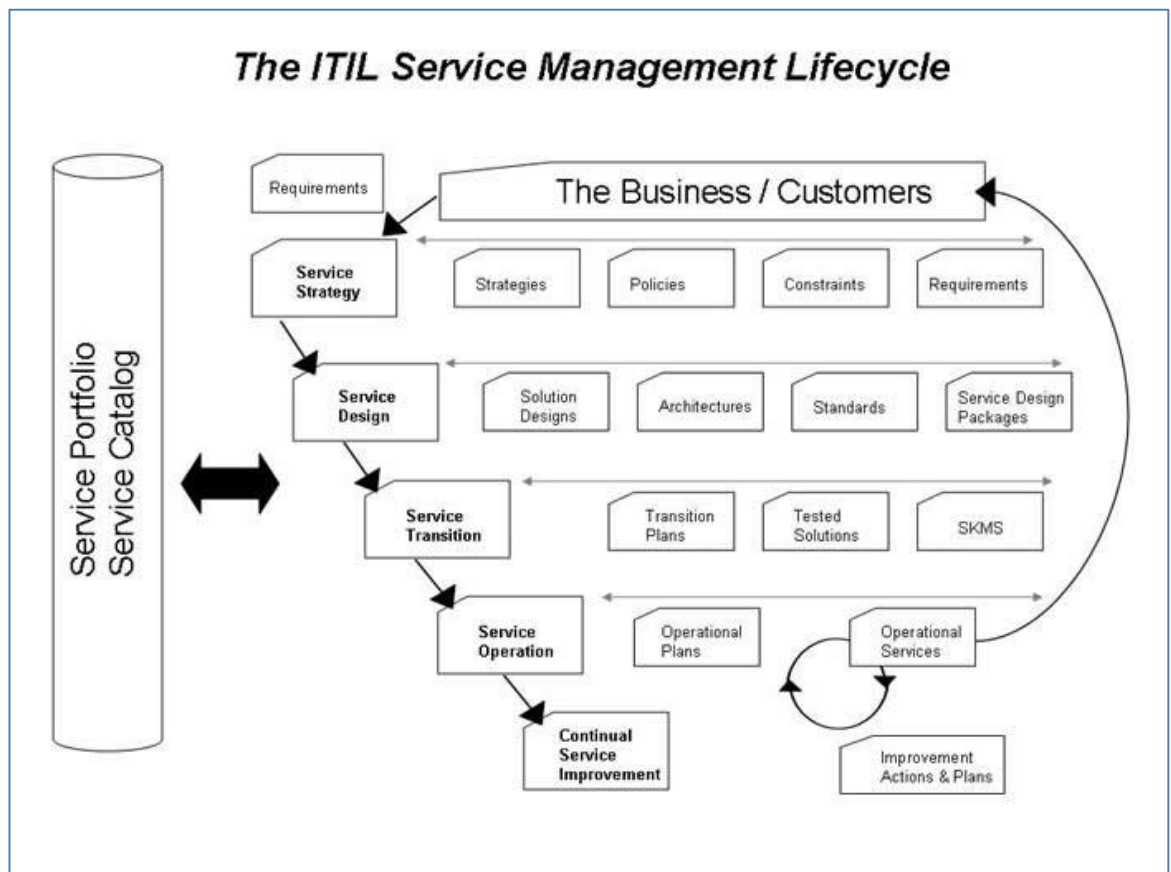


Figure 7. Key links, inputs and outputs of the Service Lifecycle stages (Cartlidge & Hanna et al., 2007, 11)

All services should be driven by business needs and requirements. Within this context they must also reflect the strategies and policies of the service provider organization as indicated in figure 7. (ITIL ®V3 Foundation Handbook)

The ITIL processes total of 25 and functions total of four are listed under the five service life cycle areas in figure 8.

ITIL Processes and *functions*

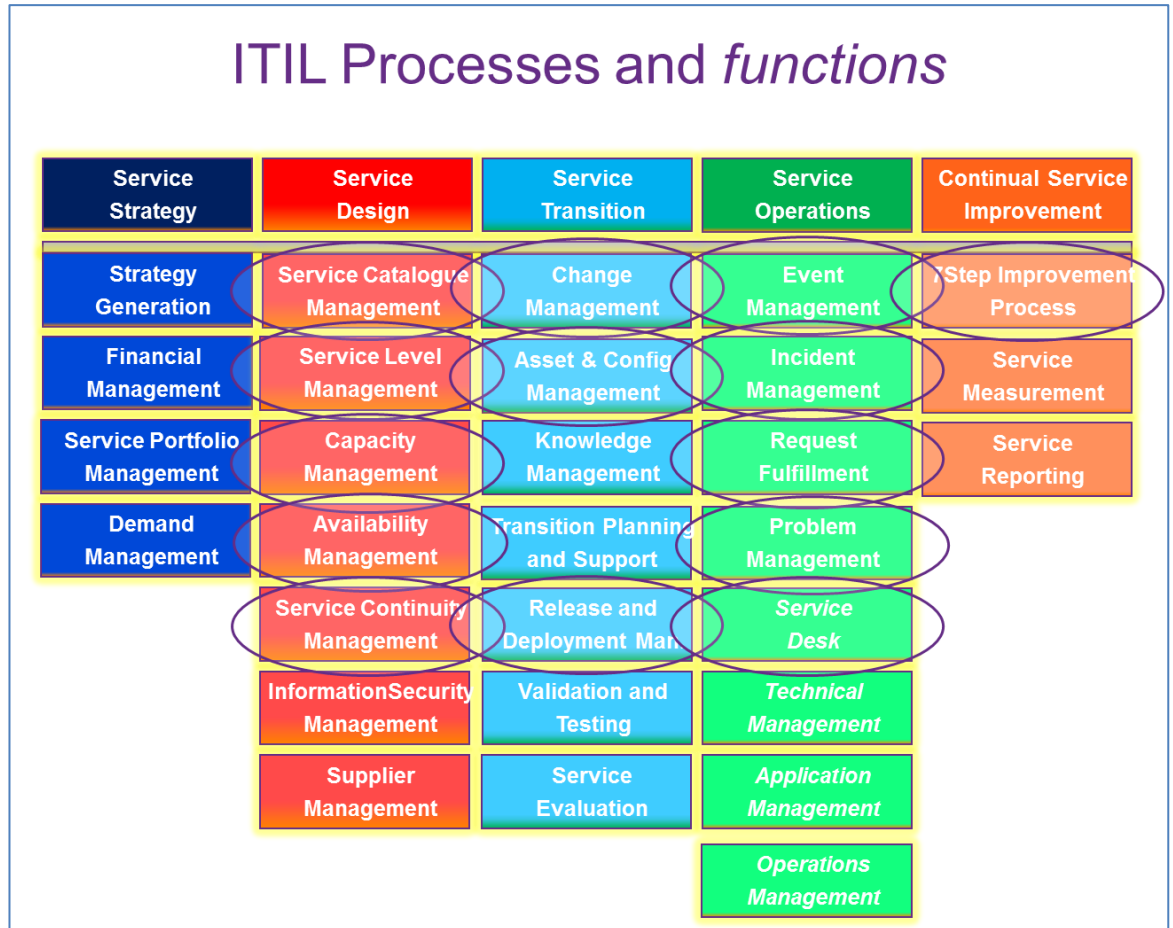


Figure 8. The ITIL processes and functions. The TeliaSonera Adopted parts are circled (Nilsson, 2014)

eTOM has been the dominant process framework for Telcos for decades, whereas ITIL is implemented later. The process development in big organizations is a time-consuming task so TeliaSonera has adopted only a part of the processes from ITIL so far.

The adopted processes are:

- Service Catalogue Management
- Service Level Management
- Capacity Management
- Availability Management
- Service Continuation Management
- Change Management
- Asset and Configuration Management
- Release and Deployment Management
- Event Management
- Incident Management
- Request Fulfillment Management
- Problem Management
- Service Desk function
- Continual Service Improvement process.

The process development work is time consuming and more ITIL processes will be adopted in later stages.

2.6 Service Assurance Operation and Processes

Service Assurance is all about making sure that the products perform according to promises given to the customers. If the product stops working it must be fixed. Service Assurance is almost completely based on ITIL and has the next processes (figure 9):

- event management - detects events, makes sense of them and determines the appropriate control action
- incident management - restores faults to normal operations as quickly as possible with the least possible impact to the customer
- problem management - resolves the underlying root causes of incidents and acts pro-actively to avoid incidents
- change management – implements changes with least impact on customers and informed in advance
- performance management – monitors, analyzes and report performance (the process comes from eTOM and it is not fully adopted yet in TeliaSonera)
- continuity management - makes sure that that services and resources can recover and continue after disasters have occurred
- request fulfillment – various mainly pro-active routines.



Figure 9. Service Assurance processes (Nilsson, 2014)

It should be noted that even if the performance management process based to eTOM, is presented in service assurance process map; it is not fully implemented yet.

The functions in service assurance area are depicted in figure 10 below. The functions are categorized to separate functional areas which are partly overlapping. There is not a clear agreement in which area the each functions should belong. According to TM Forum the applications and functions for fault management can be found between assur-

ance and fulfilment and performance management is belonging to assurance in operations process area (figure 4).

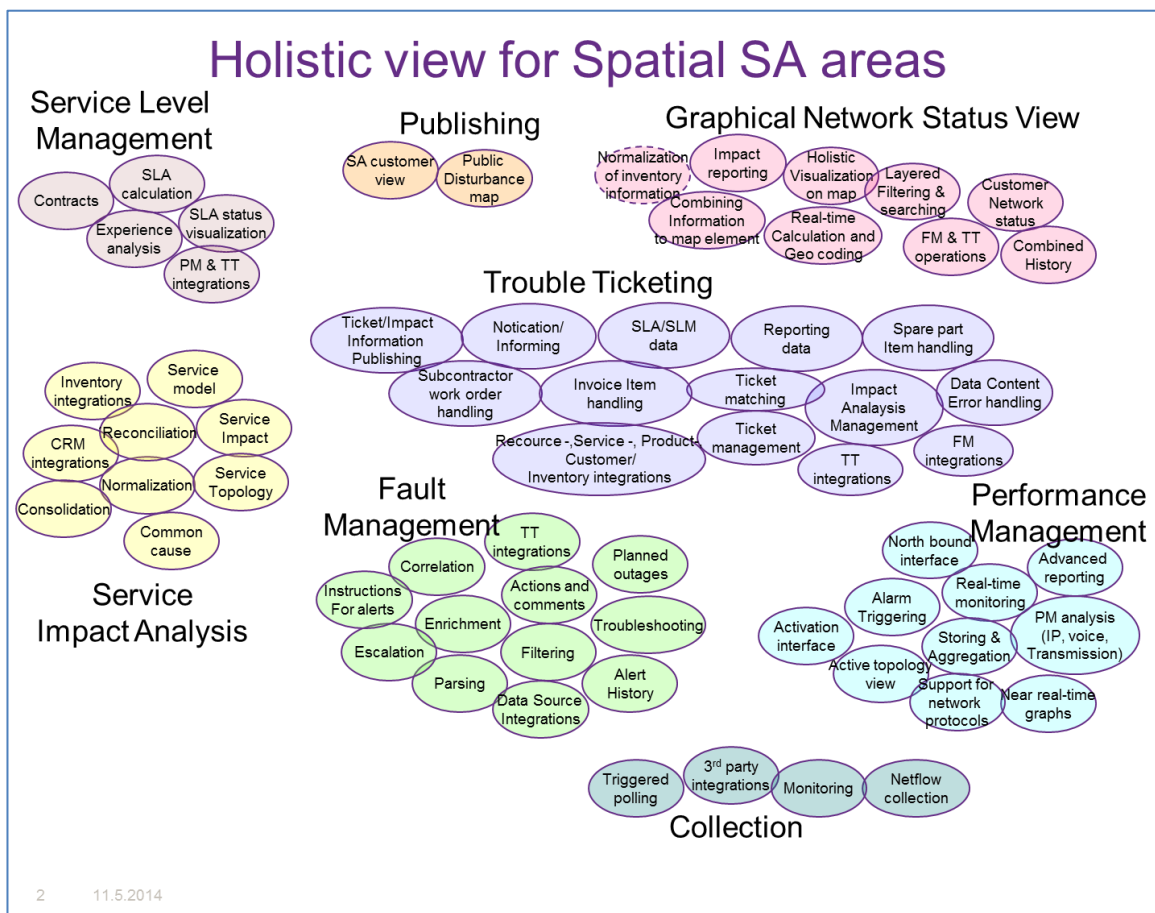


Figure 10. Service Assurance System Functions (Peltonen, 2014)

2.7 Fault Management

Fault management IT solutions are mainly used for event management process and partially in incident management and problem management processes. So fault management is not a process; it is a function. Fault management applications provide necessary functions for managing faults associated with specific resources which can be application, computing or networking resource like network elements (e.g. routers and switches), servers or other IT specific appliances as also running applications in computer memory. According to TM Forum this includes the detection, isolation, resolution, and reporting of various faults (Tmforum.org, 2014).

There are also other definitions; according to International Telecommunications Union (ITU) there are five functions (not processes) provided by network management systems; fault management, configuration management, accounting management, performance management and security management. The list is also commonly known as FCAPS. Fault management encompasses several functions which enable fault detection, isolation, and correction. Among other functions and activities fault management includes measurements for quality assurance. Reliability, availability and survivability (RAS) are measured and reported (Itu.int, 2014).

There are several functions typical to fault management (FM) solutions. The simplified use case is that the notifications or raw alarms arrive from network and the attributes of notifications are parsed. The alerts with the attributes are generated to make the notifications readable to the user. Filtering function means that only the needed events are passed through. Filtering is an essential step because the amount of the events can be dozens per second even in a small network.

In TeliaSonera case with huge global networks the amount of network events in fault management is millions per day and in performance management tens of millions per day (Tondkar, 2014).

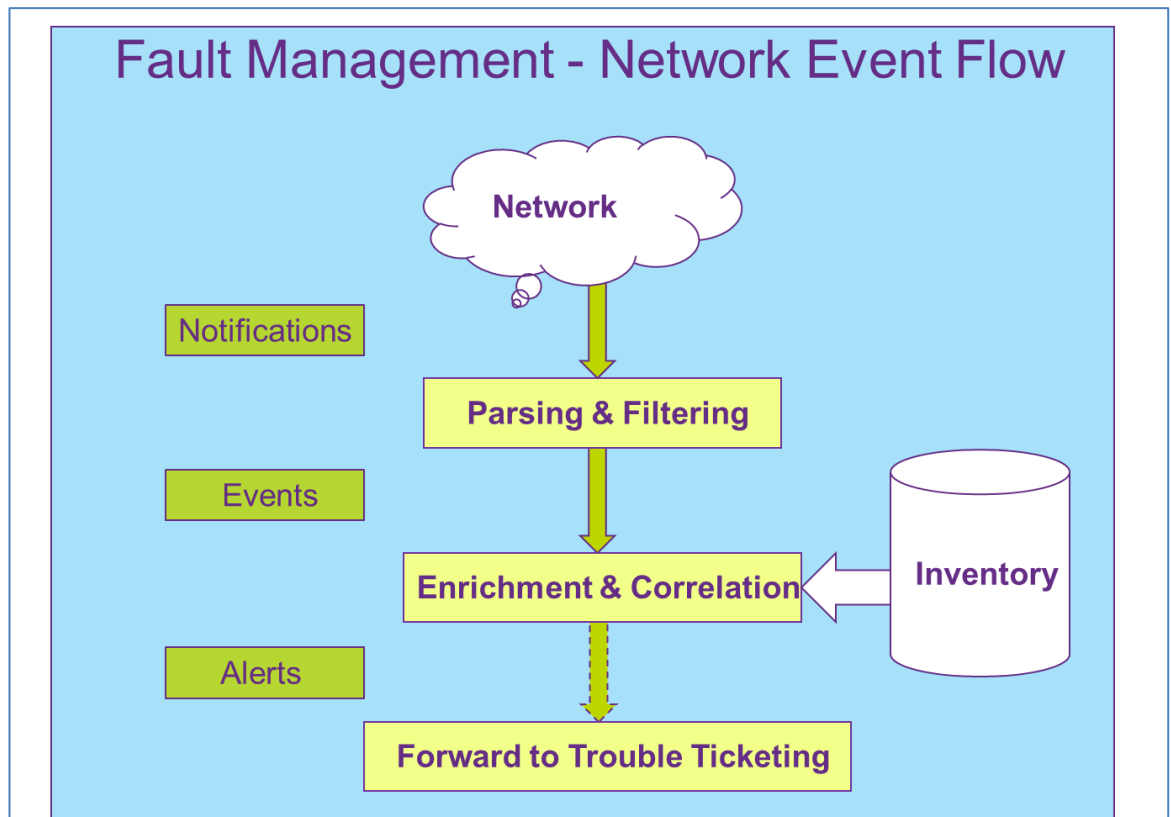


Figure 11. Fault Management Functions

In the enrichment phase the alarm information is extended from external data sources which are typically inventories. Also additional network information can be collected and used for information extension. Correlation is the process where alerts related to same fault are grouped together for efficiency reasons. After these functions the alert is resulted and represents a fault in a network element. The alert can then be forwarded to trouble ticketing system via system integration or it can be left in fault management system for later manual handling (figure 11).

3 IT Transformation as a Change

IT transformation can be seen as any change in the organization. The main idea is to use change management methodology in TeliaSonera IT transformations. All changes have to be managed to make them successful and efficient. There are several factors that need to be in place in successful change. The success rate of the change can be even calculated. The following change formula was introduced by Richard Beckhard and David Gleicher in 1980's:

$$C = (D \cdot V \cdot FS) > R$$

The formula shows that the Change (C) can succeed if the product of the multiplication of the Dissatisfaction with the status quo (D), the Vision (V), and First Step (FS) is bigger than the Resistance (R) against the change. It should be noted that if any of the factors is zero the product is also zero and the change would fail.

Even if the formula seems to be very simple and the factors may be difficult to define and measure, the formula captures the essence of many change programs and also can be used as a checklist when the change is stalling. So there must be dissatisfaction with the status quo, compelling vision and first practical steps taken for momentum to build (Green, 2007, 46).

The IT transformation can be seen as strategic change which will have impacts to business processes and via those also to roles and responsibilities. The tools and technology will also change as also applications. The change can be classified as a big, planned, and long term change.

There has been a traditional separation between IT and the business which should be integrated. Working closely together on critical business processes makes this integration easier. Business should understand the IT and the IT solutions and IT should carefully listen to business associates and understand the business process first-hand (Bell & Orzen, 2011, 252).

The change will be implemented as a project. The Project Management Institute (PMI) defines a project as “a temporary endeavor undertaken to create a unique product, service, or result.” (Pmstudy.com, 2013). As project management governance tools and practices will be used while implementing the change it would give a good and steady framework for implementation.

3.1 Change process

Dr. Kotter offers a practical approach to an organized means of leading, not managing, change. He presents an eight-stage process of change and the process is feasible for this change also (Kotter, 1996) as seen in Table 1.

Table 1. Kotter's 8-Step Change Model

Step 1	Establish a sense of urgency	The current environment is already so old and obsolete, burning platform for transformation, so it can be easy to help others to see the need for the change.
Step 2	Pull together the guiding team	Project team and the steering group members must be selected carefully. Stakeholder map tool (power/support) should be applied.
Step 3	Develop the change vision and strategy	The step is a part of the project planning.
Step 4	Communicate for understanding and buy-in	Spreading understanding and acceptance of the vision and the strategy.
Step 5	Empower others to act	Removing all obstacles to change, change systems or structures that undermine the vision, and encourage risk-taking and nontraditional ideas, activities, and actions.
Step 6	Generate short-term wins	Search for "low-hanging-fruit" and harvest them, communicate the wins, listen to the stakeholders.
Step 7	Don't let up	Use increased credibility to change systems, structures, processes and policies that don't fit the vision.
Step 8	Create a new culture	Lessons learned, link to organizational success.

The Kotter's method has also encountered critics. The Kotter's research in 1996 revealed that only 30 percent of change programs succeed. Since the book's release, thousands of articles and books have been published and the topic has been in curriculums of many MBA programs. Yet in 2008 the similar survey of McKinsey showed that only one of three transformations succeeded (Mckinsey.com, 2014).

The one conclusion is that people don't behave rationally and the irrational insights should also be taken into account in managing changes. The other conclusion is that

the culture's role should be brought deeper in the change management even if the cultural factor is mentioned also in Kotter's 8th step. More insights of the company culture can be found in the chapter 3.5.

3.2 Change type

Balogun and Hailey (Green, 2007, 21) have segregated the nature of the change from the result of the change and have separated the changes to four different types as illustrated below (figure 12).

		End result	
		<i>Transformation</i>	<i>Realignment</i>
Nature of change	<i>Incremental</i>	Evolution	Adaptation
	<i>Big bang</i>	Revolution	Reconstruction

Figure 12. Change types (Balogun and Hope Hailey, 2008)

Adaptation is a non-paradigmatic change which is implemented slowly and the nature of change is incremental so it is done in planned phases. *Reconstruction* can be seen also as a non-paradigmatic change for realigning the organization's operations in a more dramatic and faster manner than adaptation. *Evolution* is a transformational change which is also done gradually in different stages. *Revolution* is a fundamental change which is done as transformation but in a relatively short time (Green, 2007, 21).

The IT transformation as a change can be categorized as an *Evolution* because it is a "transformational change implemented gradually through different stages and interrelated initiatives" or also as a *Revolution* because "it is a fundamental,

transformative change” (Green, 2007, 21). So transformation is a key word and categoring the change to evolution or revolution is a matter of space of time for the change.

3.3 External Factors for the Change

PESTLE Analysis is a tool for assessing external future scenarios which can face the organization from different angles of views as illustrated in table 2 (Green, 2007, 37).

Table 2. PESTLE Analysis

Political	TS as a Swedish state owned company has to listen carefully owners.
Economic	Recessionary period offers several opportunities to exploit (price of labour (external) and money, available resources, extra discounts).
Social	Locations of new systems (country/city), dependent on competent workforce and insourcing/outsourcing level of system maintenance.
Technological	Appropriate solutions available on market place with optimal life cycle point.
Legal	State related customer requirements, Swedish espionage legislation. (Försvarets radioanstalt, FRA, National Defence Radio Establishment.)
Environmental	Reduction of environmental waste (data center energy efficiency, end user computing energy efficiency, toner and paper consumption and ethical handling of eletronic waste.)

The different viewpoints should be applied in the later phases of the project.

3.4 Application consolidation

According to Lean principles the sustainable IT systems improvement and new innovation cannot be attained with a focus on technology alone but the focus should be on people, process, and technology, and also in that particular order (Bell and Orzen, 2011, 11).

Gartner has stated the importance of understanding that the real problem when pursuing cost and complexity reduction by application consolidation, it is necessary to standardize and simplify also business processes. In many cases the goal of the application consolidation program is reducing the number of applications which lead to temptation of “Low-Hanging Fruit”. IT is looking for quick wins which are attractive as giving the impression of progress. Low-hanging fruit has little substantive value because it means killing a lot of little applications. The focus should be put to large expensive applications and related with business process changes (Kyte, Hotle & Carlton, 2013).

There have been attempts also in TeliaSonera where the technology has been decided first and the processes and people have been bulldozed to follow the given solution. Even if the change can be done also in that reverse order it can cause a lot of disaffection and complaints from the people. The success of the change can also be uncertain when using this order.

3.5 Company culture

Also companies, as individuals, have their own identity and behavior which differentiates them from the others. The culture is evolving and changing all the time and it is an important factor to understand when striving for change in a current culture towards future culture.

According to study “Culture’s Role in Enabling Organizational Change” conducted by Booz & Company, it was found out that the change is very hard to implement if the employees perceive the transformation as being contrary to the company’s culture. The culture comprises many small things like behavior of people in different roles and can also be put “how we do things around here”. The study found out that the culture issues are widely understood and known by the management but not however used in planning the transformations and culture remains unleveraged as an enabler of the change. With succeeded programs the cultural levers had played a role twice as likely.

The authors of the study also give practical instructions for applying company culture attributes in changes by strengthening the positive attributes and minimizing the nega-

tive ones. The most important levers are diagnosing the existing culture, creating the critical behaviors called “critical few”, elevating the morale by influencing the employees pride and commitment, using informal peer networks and motivators and using storytelling (Deanne Aguirre, 2014).

TeliaSonera is quite a new company even if it is established from two old companies Telia and Sonera. The company’s culture is still based on two different cultures at some level and common TeliaSonera cultural things might be hard to find yet twelve years after the merger.

3.6 Organization maturity

The Change Maturity Model is based on the same 5-level multi-dimensional approach as the traditional ones for process capability maturity e.g. in COBIT® and CMMI® definitions where organizations evolve from level 1 towards level 5 (figure 13). The levels are *Initial(/ Ad-Hoc)*, *Repeatable*, *Defined*, *Managed* and *Optimized* (Change-management-institute.com, 2013).

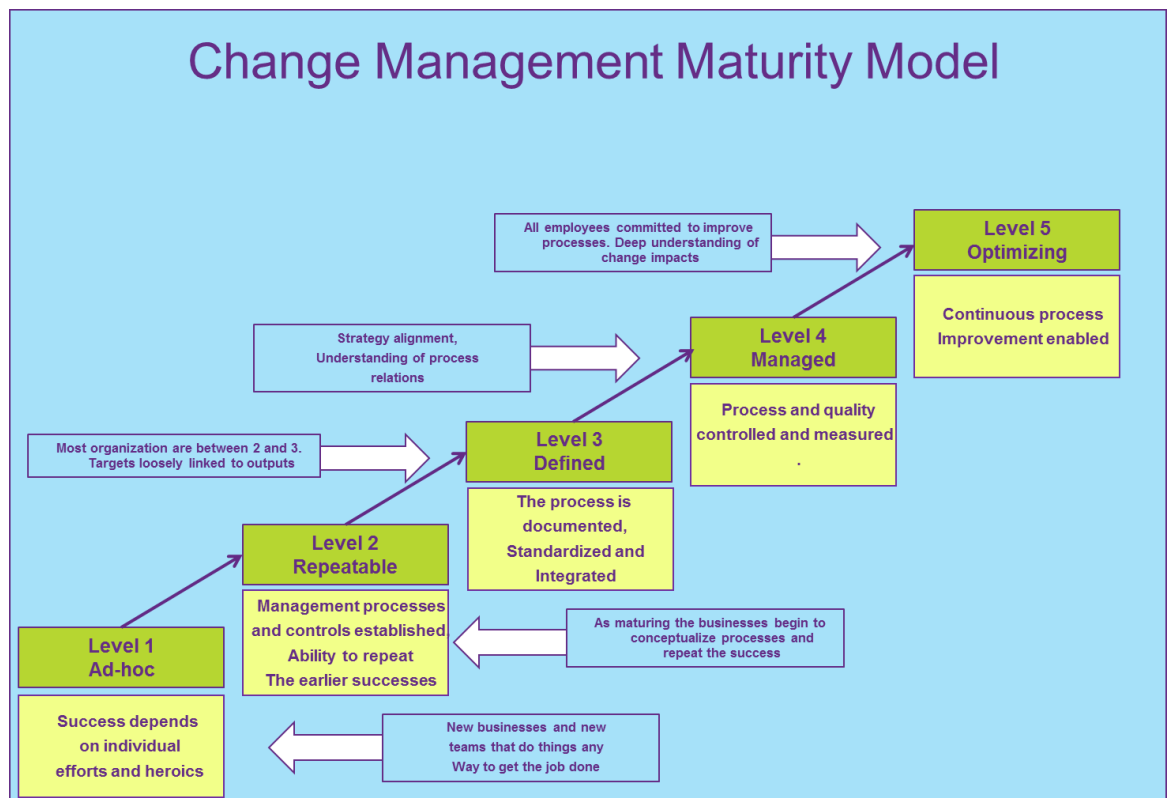


Figure 13. Change Maturity Model (Adopted from CMMI)

The level of process maturity can be measured quite easily with self-assessment methods that can be either commercial or self-developed. The measurement helps to understand the current maturity by establishing the baseline which tells where we are now. The second step is to understand the potential of improvement and the evolution of maturity drive to continual improvement because the higher maturity levels typically deliver closer alignment between business and IT. These kinds of process maturity measurements have been executed in TeliaSonera about Change Management in different business units. The next change maturity measurement will be conducted next summer by the author.

3.7 Communication in changes

According to *Leadership and Communication in Multicultural Environment Course* the change communication should be *Candid*, which means open and two-way; *Contextual*, lot of factual information without jargon; *Constructive*, up-front considered communication, focusing positive sides and effects like opportunities, benefits, etc.; *Consistent*, same message via different channels to all recipients, and *Continuous*, repetitive, often and using both formal and informal methods. The communication plan is created as a part of a project plan and these factors should be taken into account.

According to J. D. Duck the change management consists of three separate parts. Managing the conversation between the people leading the change effort and those who are expected to implement the new strategies, managing the organizational context in which change can occur, and managing the emotional connections that are essential for any transformation (Hbr.org, 2013). So it not the matter of communication only, it is also a matter of managing the on-going communication!

Maybe the most important goal for communication is to attain the commitment from top management for the change. Also middle management must be inclined to the change to get employees to the same side and win the hearts and minds of all personnel.

4 Project Management

The TeliaSonera project model (TS Promo) is a group-wide framework for project management. According to the corporate governance, all projects are established, managed and concluded according to this framework. The model provides a common project decision-making framework and supports the management of projects with common instructions and templates.

4.1 Project Model of TeliaSonera

The phases, decision points and documentation of the project are shown in figure 14 below. The life cycle of any project consists of pre-study, planning, execution and closing phases.

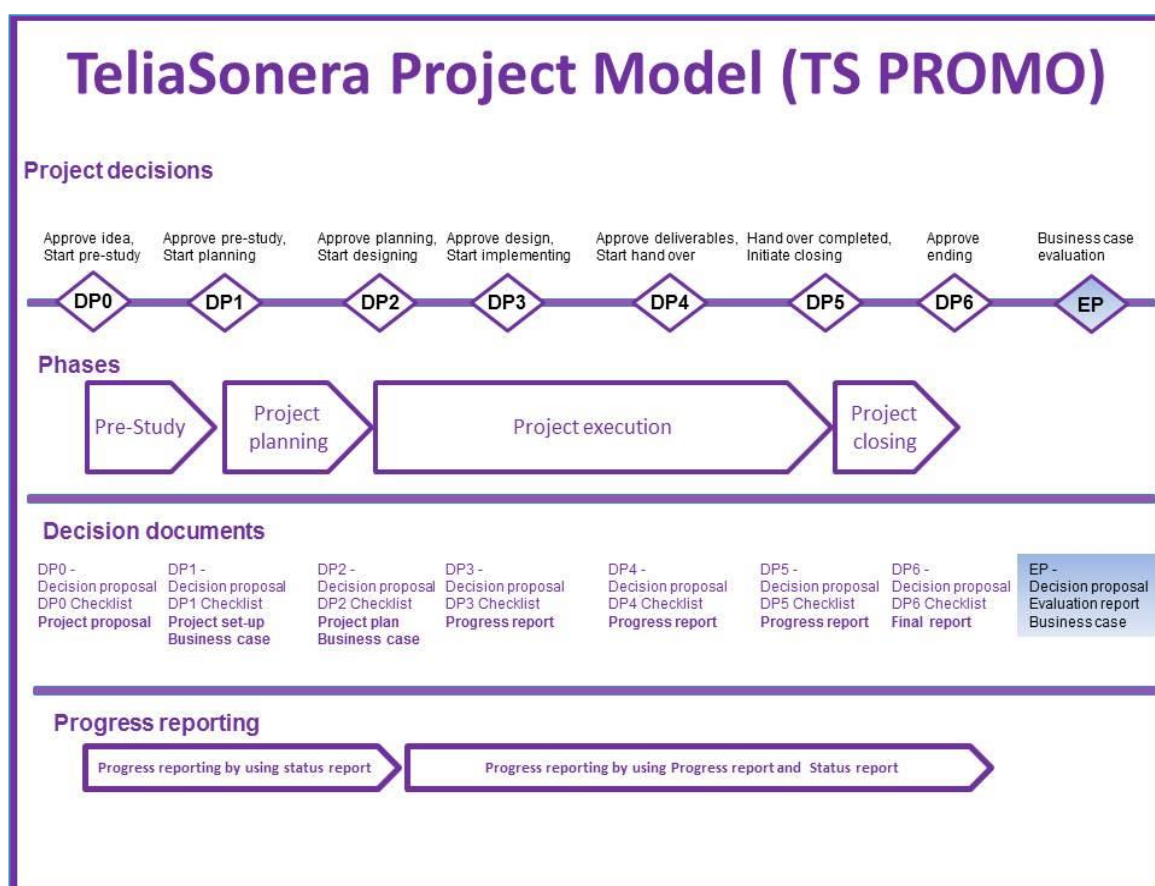


Figure 14. TeliaSonera Project Model

During the project initiation before pre-study phase and first decision DP0, the project stakeholders are identified. The project owner acts as the chairman of the project steering group to which he/she appoints the relevant members.

Typical activities at this stage are:

- Describing the project idea
- Performing a preliminary risk analysis
- Defining the expected business benefits
- Securing the resources for the project pre-study
- Defining the expected results for the pre-study phase.

The project owner creates the project proposal document and DP0 presentation for the project steering group and prepares to take the decision to initiate the project (DP0 – GO).

A project initiative typically derives from a business development initiative, process improvement initiative or from a need to deliver a one-time outcome in basically any business context. Typically, a business decision is first taken to go forward with the initiative. Also the person ultimately responsible for the project, called the project owner, shall be appointed.

In the project set-up phase (before pre-study phase and first decision DP0) the project conducts the necessary investigations and preparations to conclude the scope and limitations of the project. The objectives are to describe the project's goal, scope, result, conditions and constraints in a project set-up document and its appendices. The pre-study phase of the project covers the next phases of the project:

- the project idea is analyzed and the project results are defined
- the major risks are identified and analyzed
- the complexity of the project is analyzed according to the complexity model
- the preliminary business case and project budget are prepared
- the high level work breaks down structure and project schedule are described
- the expected business benefits and expected objectives are described.

In the project pre-study phase the project conducts the necessary investigations and preparations to conclude the scope and limitations of the project. The objectives are to describe the project's goal, scope, result, conditions and constraints.

The documentation related consists of the Project Set-up Specification (Attachment 3) and the Complexity Model (Attachment 2). The pre-study is presented in in chapter 7.

4.2 Project risk management

The purpose of the project risk management is to identify, evaluate, communicate, mitigate and eliminate the risks. Project risk management is an integral part of all project work and is actively performed by project management throughout the project. It is also a mandatory activity in all TeliaSonera projects. The owner of the project is owner of the project risks and therefore accountable for proper risk management. The project manager is responsible for managing and reporting the risks during the project.

Without a good risk management the project manager falls into crisis management as problem after problem presents. Crisis management is reactive process whereas risk management is a preventive, proactive process that allows the potential problem identi-

fication before they occur and also put the corrective actions in place to avoid or lessen the impact of the risk (Milošević, Martinelli & Waddell, 2007, 219).

The project risk is defined as an uncertain event or condition when occurring has an effect on scope, schedule or cost of the project. A risk may have one or more causes and, if it occurs, it may have one or more impacts, either positive or negative. The risks are always in future while project issues are the present problems or concerns influencing to the same project constraints.

The risk management process is depicted in figure 15. The first step in the process is to identify all of the events which could cause any impact to the project. Risk identification is an iterative process which occurs throughout the project lifecycle. All potential risks should be identified so the amount of the risks in this phase can be overwhelming.

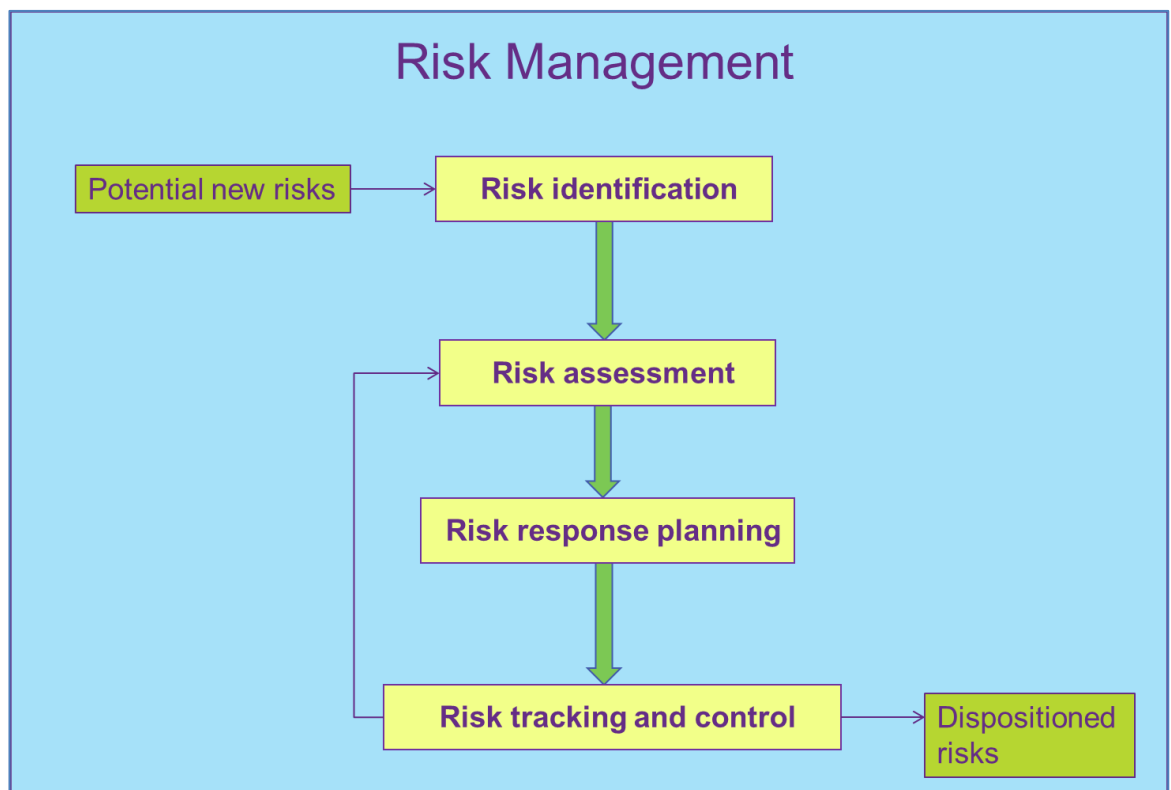


Figure 15. Risk management process flow (Milošević & Martinelli et al., 2007, 220)

The next step, risk assessment is needed to investigate all the risk events identified in the previous step. The reason is to pose the most serious threats to the success of the project and prioritize the risks accordingly. The analysis can be done by using “if – then” statement where *if* is the identified risk event and *then* the impact of the event. Each event should be analyzed to get the in terms of the outcome, weighting the severity of the impact of the outcome and the understanding when the event can occur.

The third step is risk response planning where the response actions to the risks are planned. The actions can be either mitigation of the impact of the risk event or elimination the possibility of risk occurrence. The other two responses are the acceptance of the risk or transferring the risk to another party which can be for example a vendor.

The last step of the risk management is concurrent monitoring the trigger events related to the risks and identifying and executing risk response plans for new risks (Mi-lošević & Martinelli et al., 2007, 220 - 223).

The project risk management is initiated already during the project initiation phase. There is no formal risk management process on-going but the major risk identifying is part of the project phase and the major risks are documented in Project Set-up Specification (attachment 3). Each project risk should belong to one of the categories which are Project Management, Organizational, External and Implementation. Further these main categories have four standard sub-categories and fifth sub-category is “Other” and it should be used if the risk does not fit to the standard ones.

5 Research Methodology

The methods of the study were searching and collecting the existing business objectives and goals for BTS IT. The IT viewpoint as internal factors for the change/IT transformation was collected from BTS IT unit's management and senior IT architects with a questionnaire (attachment 1) in December 2013. The survey was done by interviewing and collecting information via email particularly for this study. The questionnaire was sent to 20 people, of which 15 responded so the plausibility of the study is somehow limited. The results were got by email and by interviews and the results and the analysis of the survey are provided in chapter 6.2.

The visualization is used in analysis by representing the results as Force-field diagrams. The sizes of the ovals in figure 17 and the thickness of the arrows in figure 18 and 19 indicate the relative proportion of responses.

The case project was initiated and the pre-study phase was performed according to TeliaSonera project model TS Promo. The project's complexity was assessed and the project was described with its scope, organization, costs and related risks.

Also a lot of discussions and email conversations with company internal and external specialists were performed in gathering information for the work.

6 Internal Factors

The targets from business to IT and also results of the questionnaire survey may be considered as internal factors for the change from change management perspective.

6.1 Targets from Business

The needs and target KPIs for the transformation has been collected from business units and product management unit. The cost reduction goal is based on the experiences of system integrators (figure 16).

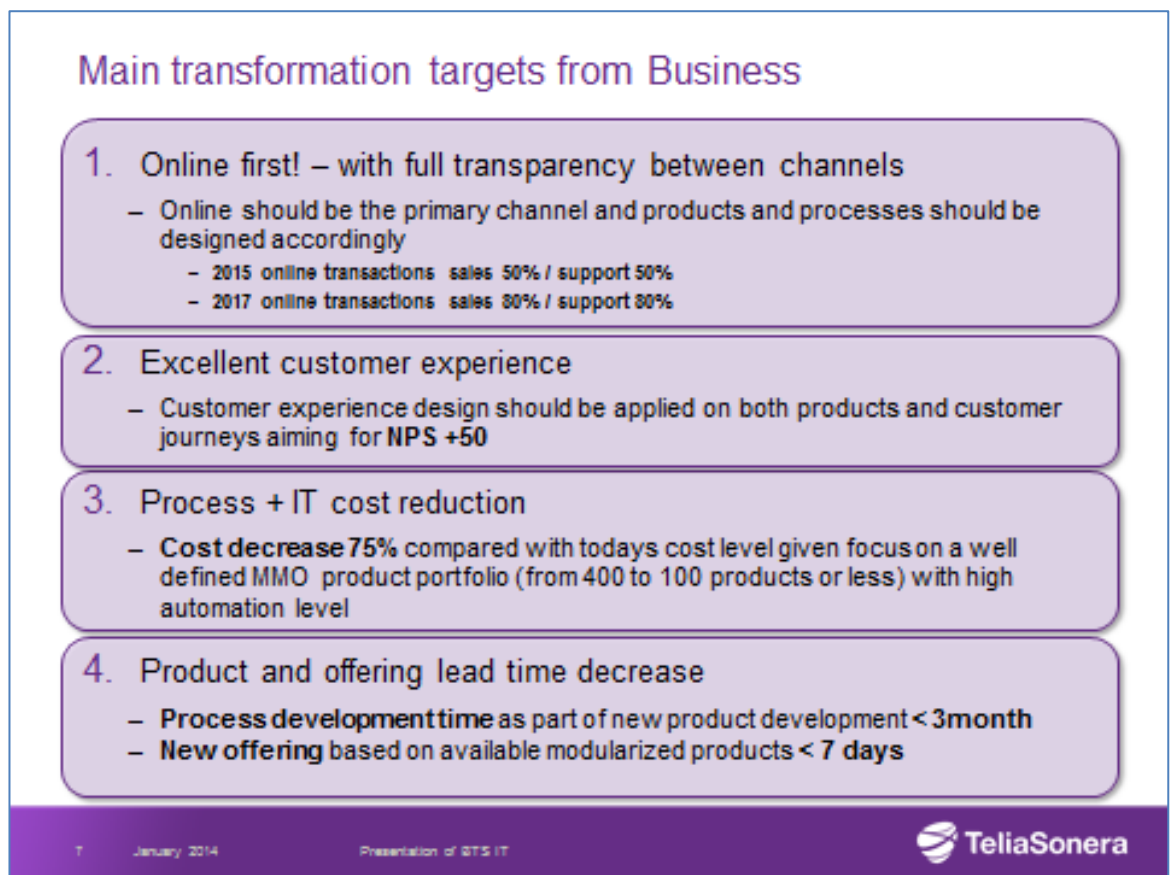


Figure 16. Prioritized targets from Business to IT (Vepsäläinen, 2014).

All of these targets got from the business units are in the scope of service assurance area transformation:

- Service assurance processes are in key role in smooth online service chain. The continuous improvement for the processes and IT solutions are needed to be able to support the growing online services
- At the end of the service chain there is a customer and the good quality service assurance has the impact to the customer experience
- Application consolidation reduces direct maintenance cost and automation increase indirect process costs
- The new processes and IT solutions must better aligned with business needs of quicker product offering.

The targets set several challenges to IT. The system architecture is complex and the systems are heavily integrated. Compromising customer experience and cost reduction requires creativity and new way of thinking.

6.2 IT Transformation Survey

The purposes of IT transformation were seen as IT renewal, strategy implementation, complexity reduction by application consolidation and meeting the business needs. The size of the oval on the diagram illustrates the share of responses (figure 17).

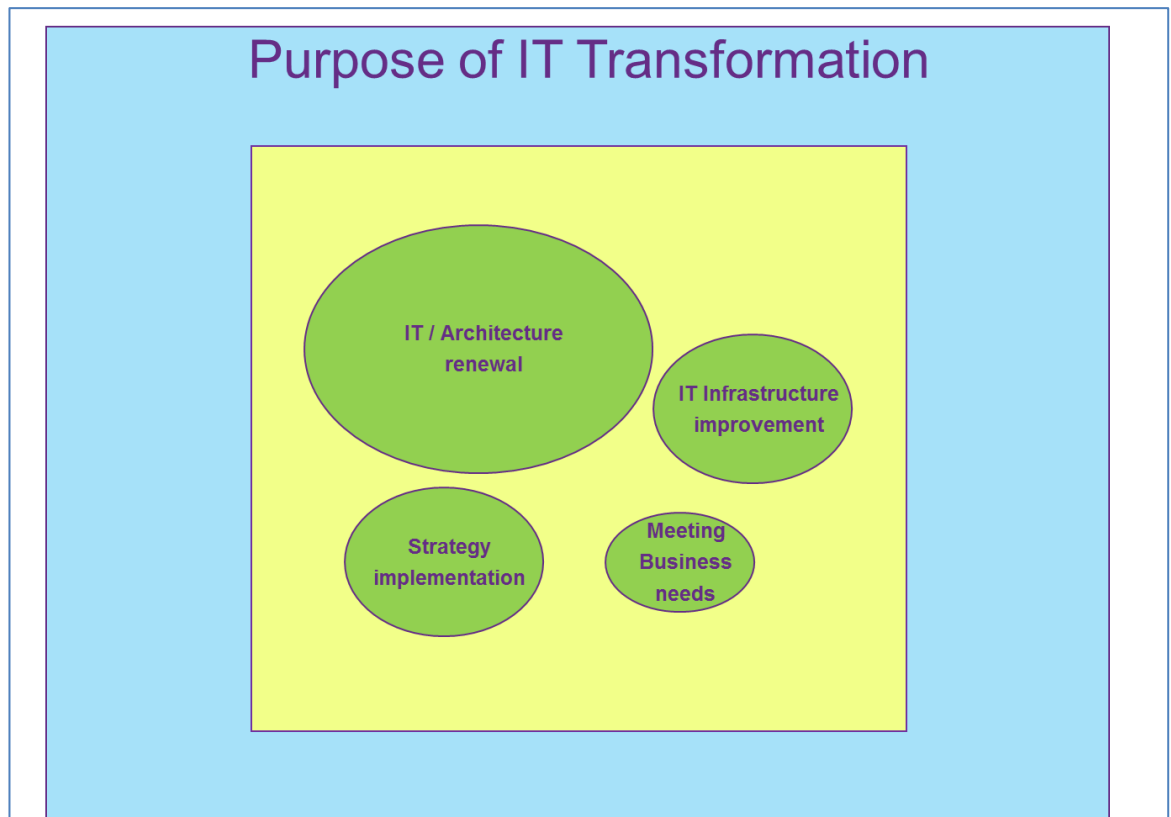


Figure 17. How IT associates see the purpose of IT Transformation.

The burden of legacy systems can be seen in answers. Biggest share of respondents saw IT Transformation as a renewal effort of old IT systems and striving to new IT architecture. The current IT environment is perceived complex and reduction of complexity is illustrated in oval IT Infrastructure improvement. The strategy implementation is perceived as third reason and satisfying the business need does not come until the fourth factor.

The drivers and constraints for the transformation are illustrated in the first force-field diagram (figure 18) and Key Success Factors and risks in second diagram (figure 19).

The force-field diagram was originated by psychologist Kurt Lewin and its purpose is to illustrate the forces impacting the major changes to be taken into account in implementing the change. The thickness or widths of the arrows illustrate the strength of the force in each case. (Craig, 2000, 101-102.) In the analysis made of the survey results the amount of the certain replies affects linearly to the arrow width.

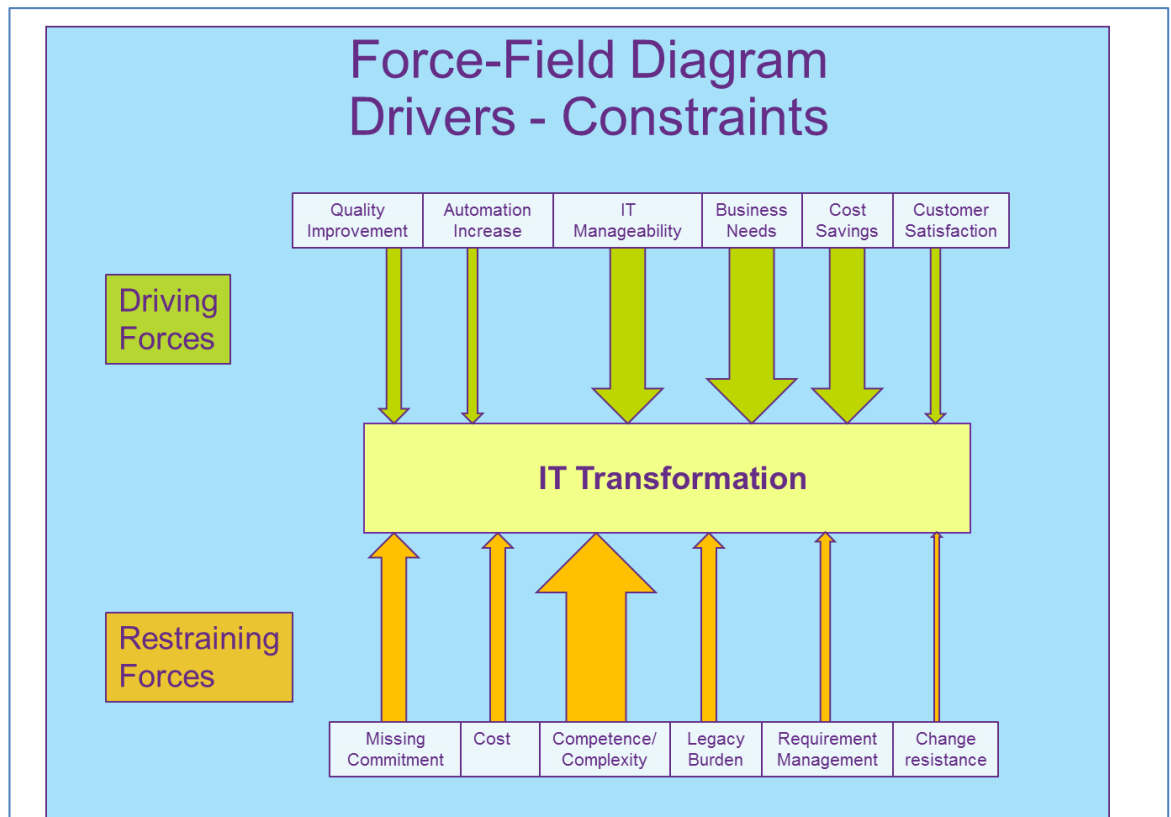


Figure 18. Driving and restraining forces of IT Transformation.

The primary drivers for IT Transformation are business requirements, cost savings and IT manageability. The biggest constraint for IT transformation is lack of internal competencies and the complexity of the current IT infrastructure. So even when there are systems remained in place long past their useful life cycle, IT might be reluctant to even think of tinkering the legacy systems unless it is an absolute must because the designers and builders of the systems have long since left the company and the systems are poorly documented or the documentation is lost.

IT also perceives that both the lack of business commitment and also top management commitment is a substantial restraining force against IT transformation.

The outcome from this diagram can be treated in several ways (Craig, 2000, 103-104.):

- Concentrating only to driving forces and at the same time ignoring the restraining forces
- Increasing the power of driving forces but also taking account of restraining forces
- Taking account of restraining forces and take actions to decrease them
- Increasing the driving forces and decreasing the restraining forces
- Forgetting the whole idea of the change if the restraining forces are bigger than the driving forces.

The second lowest option ‘increasing the the driving forces and decreasing the restraining forces’ can be applied in TeliaSonera IT transformation. The complexity issue can be mitigated by a clear IT architecture discussed later.

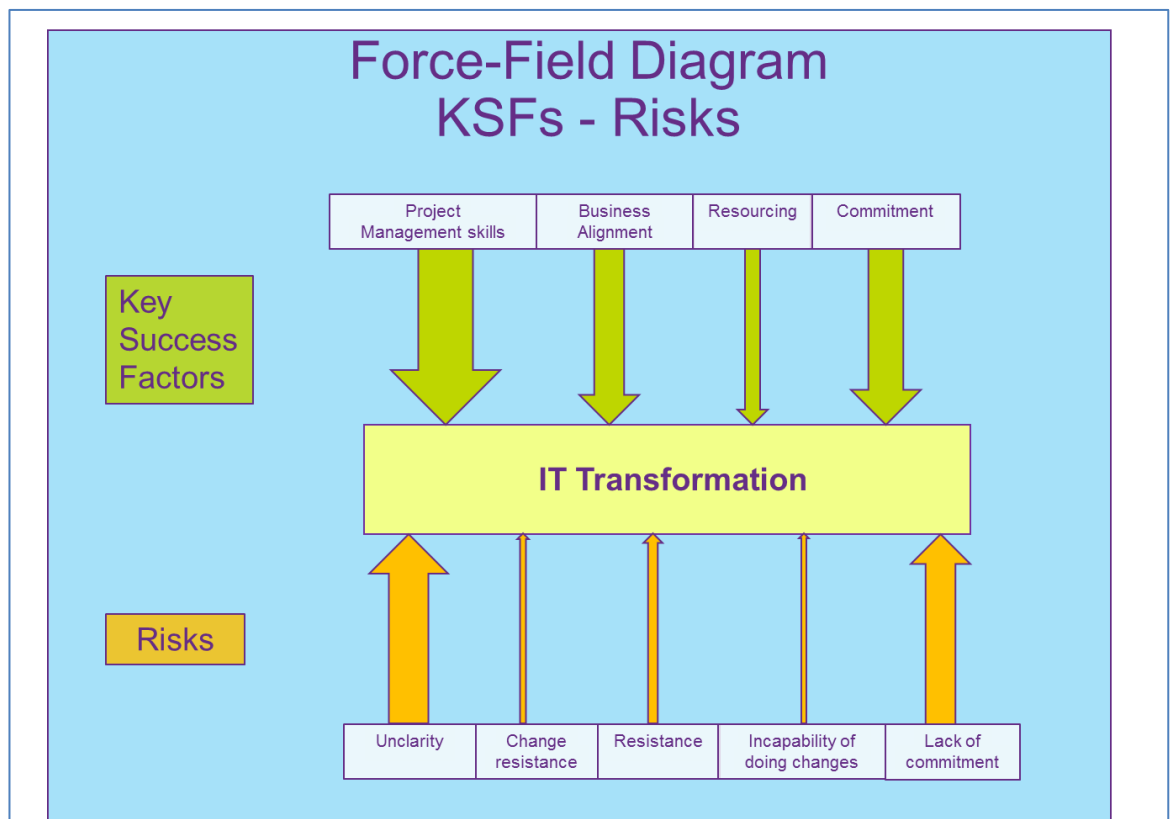


Figure 19. Key Success Factors and Risks of IT Transformation.

The most important success factor for IT transformation according to survey seems to relate project management skills. Clear targets, knowledge of all needed information, ability to keep the schedule and scope, good planning and perseverance of running the project are all categorized to project management area. Commitment from all levels of management from business, IT and stakeholders proved to be the second success factor, and the business and IT alignment the third one.

Mutually the risks included also absence of commitment. The biggest risk was vagueness in targets and scopes, over-optimism in planning and cost estimations, unclear expectations and alienation from business, these all are bundled to risk “unclarity”.

60% of the respondents proposed phased approach for IT Transformation, 30% saw that the parallel approach would be the most suitable and only 10% suggested a Big Bang approach. The respondents assessed that the IT transformation can last from two months to ten years and the calculated average duration was 3,9 years. Most of the respondents (60%) felt that TeliaSonera should use internal resources in implementing the IT transformation while 20% replied that TeliaSonera should use external forces and 20% proposed the usage of both resources.

7 Common Fault Management – The Case Study

The common fault management project is applying the theories and factors presented in earlier chapters. The author of the thesis has been the responsible project manager at the pre-study phase of the project. The rest of the project (planning, execution and closing phases) will be handled by a TeliaSonera senior project manager.

One of the main subjects of the thesis work was to initiate the common fault management project and execute the projects the pre-study phase. The created set-up specification of the project is in attachment 3.

7.1 Project idea and the deliverables

The ultimate goal of the whole project is to select and implement a common Fault Management solution for TeliaSonera Broadband Services replacing the current legacy systems in Sweden and in Finland. The Common Fault Management solution can be also one of the existing ones if the current one could substantially meet the business and architectural targets. In brief the common global FM solution should be an application with so less customization as possible with standard interfaces, meeting the most important business requirements for now and also for the future and fitting into architectural frames.

People, processes and the technology – and in this particular order, was stated in chapter 3.4 and it means that the starting point should not be the technology. Legacy systems are creating the value to the current business so the new system has to offer more benefits to business. The project should be considered also a business transformation not only the IT renewal project.

7.2 Stakeholders

The systems have both internal and external users. Internal ones are the employees working in Incident and Problem Management processes, IMC and Customer Service clerks and 2nd level experts and also specialists working for Network Production.

External users are business customers who are using TeliaSonera Network Monitoring products which are build using particular FM applications.

The Main Process Owner of Incident Management process is the Head of IMC and also the role of Business owner of the Fault Management systems belongs to the same party.

The vendors play an important role in Fault Management area because the major part of operational system management is outsourced. Third party system integrators are also used as maintenance responsables. The level of outsourcing varies a lot system by system.

7.3 Project complexity

The project complexity model is used to ensure that all projects will be managed by a project manager with the required competence and experience, i.e. a TeliaSonera Project Manager, a TeliaSonera Senior Project Manager or a TeliaSonera Principal Project Manager. Having a project manager with the right profile ensures a higher probability for the project to be successful. The complexity assessment shall be used as the basis for discussion between the manager of project managers and the Project Owner.

The majority of the complexity dimensions have been considered to be Moderate, so there is a need for a TeliaSonera Senior Project Manager after the pre-study phase. The result of the analysis can be seen attachment 2.

7.4 The Financials – The Business Case and the Budget

The business case assures that the project supports TeliaSonera's strategy by proposing value to the customer and gaining benefits for the company. It also describes the present situation including opportunities and difficulties, rationale for the project, time for implementation of the project and the effort. The business case covers legal and regulatory aspects and the sustainability aspects of the project. The upmost reason for the

business case is to provide the financial overview of the project with cash flow calculations and profit and loss impacts.

The preliminary business case is created and included in project documentation but is left out from the thesis due to confidentiality reasons.

The funding of the project is handled by the IT Transformation Program.

7.5 The Project Break Down Structure and Schedule

The project is divided to several phases which can be done partly parallel. The current state analysis called “as-is”, the future state envisioning called “to-be”, GAP Analysis i.e. the analysis about the gap between current and future state, vendor evaluation and selection and implementation phases.

The first step of a change according to Kotter is to establish a sense of urgency. IT associates know the situation of legacy systems well but the message of the needed change has to be extended also to business associates i.e. IT unit’s stakeholders. Also management has to be convinced of the necessity and the urgency of the change.

The next phase is to find the right people for the project – as revealed in IT questionnaire study - the lack of project management skills was seen as a most important key success factor for the transformation. The right people should be selected also for achieving engagement from stakeholders and commitment from the all levels of management. The professional full-time project manager who has proved experience in similar projects is a must for the project. Internal technical specialists of service assurance area must be involved to the project but the fact is that they are already almost fully allocated to daily operational work which makes their usage very limited.

The proposal is to use external resources from IT service companies like Tieto or CGI who already know the TeliaSonera IT environment well and who have the proven experience from the similar IT transformation programs and the good methods of executing big projects. The application vendor which will be selected later in the project is

in a key role also. The usage of external work force necessitates very good vendor management skills from the internal project group members.

7.5.1 As-Is

The assessment of the current state including the business processes and the IT solutions is the next step. The assessment phase is very important; the biggest risks for the transformation were related to ambiguity of the complex environment. The current Service Assurance/Fault Management computing environments consists of five separate legacy applications area and all of which have a number of integrations with the other systems.

The parts of the systems are extensively modified and seem to have remained in place long past their useful life cycle for several reasons. The systems are developed to support unique country based business processes, they rely partly on obsolete technology and the developers might have left the company. The systems have been repeatedly patched and the changes are poorly documented or the documentation is scattered around the organization. As a result the current environment is very complex, risky, fragile and expensive. The systems are developed for multivendor heterogeneous networks around globe. The amount of network elements (NE) is hundreds of thousands.

By addressing the requirements from business and managing the architectural needs and demands envisioning of the wanted solution – the vision of the future state - can start. The gap analysis will be committed next to be able to conclude the analysis and move to evaluation phase. The evaluation phase consists of market place study and vendor evaluation including commercial negotiations with RFI/RFP processes.

The transformation from legacies is not an easy job. Legacy systems are built to serve as well as possible and the user requirements have been met with tailored and customized applications. For the users, the systems are familiar and people are used to work with them. Replacing the legacy with COTS type of solution means loss of some business functionalities so the transformation cannot be seen purely only from IT point

of view. The transformation must be justified by added business value so the business associates must be involved in the project from the start (Luukkanen, 2014).

The information of the current systems consists application and versions, vendors, stakeholders, computing platforms, network technology and area where the system is used, number of interfaces and system integrations, number of occurring events or monitored objects and the amount and organizations of users.

The related business processes, use cases, demands and also legislative and other regulatory requirements will also be assessed and documented.

According to Tieto Transformation method based in TOGAF the As-Is phase forms a *baseline* for the transformation (Luukkanen, 2014).

7.5.2 To-Be

After knowing the baseline situation the envisioning the future state can start. The Vision of the future Fault Management solution is the common solution for all networks and processes cross-country if it is even possible. The enterprise architecture including business architecture, informations systems architecture, Technology, IT architecture and Data/Information Model must be followed. The high level Next Generation Service Assurance (NGSA) architecture is depicted below in Figure 20.

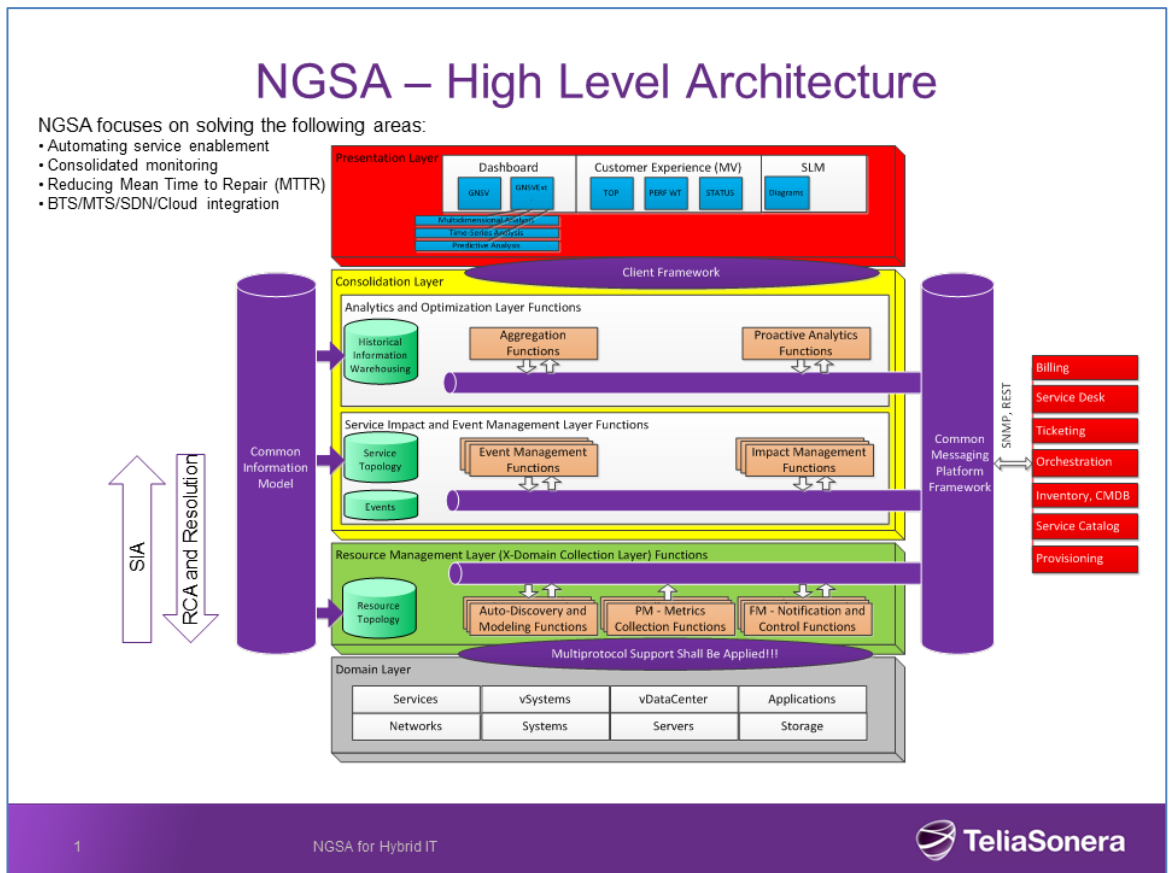


Figure 20. Desired IT architecture (Järvilehto, 2014)

NGSA shall be based on unified modeling approach, which will create view of the entire systems environment. NGSA shall be based upon powerful object-based management model that is built and maintained automatically. NGSA shall be driving approach where the all devices in the environment shall be modeled – networks, servers, software, and applications – even customized devices.

NGSA has three layers:

- Analytics and Optimization Layer which provides a data warehouse for long term data trending, analytics engine, and reporting capabilities
- Impact and Event Management Layer which provides full event management lifecycle, Root Cause Analysis (RCA), and Service Impact Analysis (SIA)
- Resource Management Layer which provides discovery, data collection, performance, and event monitoring and notification capabilities.

The presentations layer is above and domain layer below the NGSA layer stack.

7.5.3 Gap Analysis

When the baseline is known and the future state is envisioned the gap between the current and the future can be analyzed which gains critical insights. It helps to identify the existing processes and outcome and the future state desired outcome and to map how the gaps can be filled with the required new solution functionalities or the tasks what are needed for closing the gaps. As a transformation is done with a phased approach the gap analysis provides input for a roadmap to the future visionary state.

7.5.4 Vendor Evaluation and selection

After the phases above the project team would know *what* and *why* to look for because the requirements are clear. The selection criteria will be prepared with suitable weight factors. The phase consists vendor visits, demos, conference trips and finally the commercial RFI- and RFP processes and negotiations and laying agreements with the selected vendor (Luukkanen, 2014). The procurement unit's help is needed in the vendor evaluation, selection and negotiation phases.

7.5.5 Implementation

The implementation will be planned and scheduled in detail in the projects planning phase. The challenge in implementation phase is to keep the production up and

running smoothly and uninterrupted. The implementation concerns also business processes related to fault management function. The users are in the key role in adopting changes in the processes. Implementation means the replacing the current applications with the new one which must be done from network domain to network domain and from system to system. The new system and legacy systems will be used at the same time for a while.

7.5.6 Schedule

The preliminary high level time scale for the project is depicted in figure 21. The schedule is made intentionally optimistic. The pre-study phase is already conducted and the time estimation for the planning and execution phase is one year if the required decisions can be made in time.

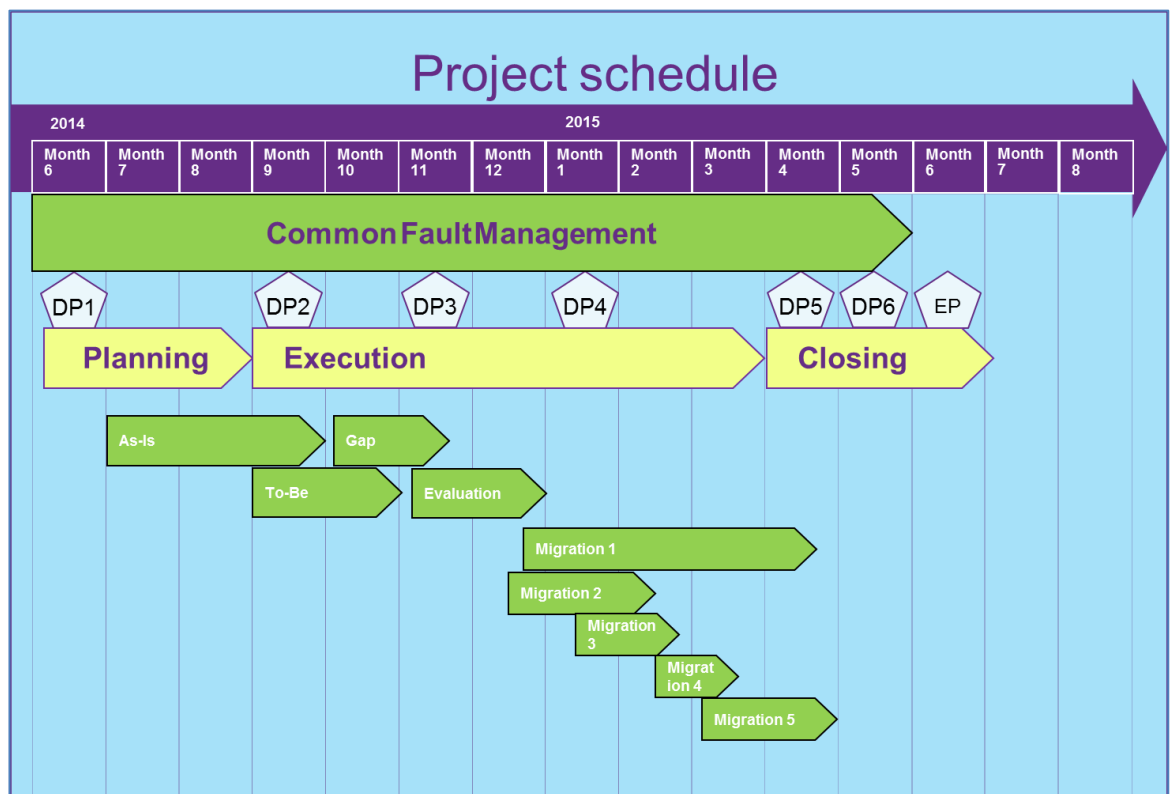


Figure 21. Time scale for Common Fault Management Project

8 Conclusion

A lot of scattered information was collected for the thesis. Business requirements towards IT unit, existing principles about transformation programs and business processes were studied. Applied IT frameworks, service assurance and fault management function and IT architecture were explored. The performed inquiry study revealed IT management ideas and thoughts about IT transformation and the drivers and constraints related to the IT transformation.

The change management methodology and the various aspects impacting the success of the change were addressed. One of the thesis' objects was to support the simultaneous started common fault management project which was temporarily delayed due to organizational changes in the company. The objective was achieved, and the work done within thesis will be useful in continuing project.

The author familiarized himself with processes and reviewed the project management governance. Different roles as a student in a familiar working environment provided an opportunity to question and challenge the existing issues and helped to meet new people and to see familiar people in a new light.

9 Discussion

The program and project management in TeliaSonera is quite complicated with several separate decision organs. Projects are also competing with each other for the scarce resources. IT unit among others has suffered from recent years continuous lay-offs and a lot of internal tacit knowledge has been lost. Saving activities have left the impacts to IT environment. Large numbers of the systems are aged and not fully capable of meeting the current business requirements. In Service Assurance area the impact analysis features are the most wanted ones. Also more automation to processes is needed. The platform standardization and data centre consolidation have added pressure to transform the applications to virtualized server platforms which are still new to some application vendors.

IT must response to the requirements by doing IT Transformations. The drivers for the changes have to be reinforced and the constraints turned down. The company cultural aspects and the change management methods can be used in programs and projects for ensuring the success. The commitment from management and engagement from stakeholders are crucial for the project success and without them the project is doomed.

The users have to change their working in IT Transformation while the business processes change. Impacting to people's behavior is a challenging task. If people are accepting the change in their minds the implementing the change is easier and quicker. Change management learnings should be exploited in IT Transformations.

Planning is more important than the plans itself. Planning should be done focused on for both short-term and long-term periods. Planning should be done together with stakeholders; users, process owners, business associates and architects. The silos should be removed from the organization and the re-construction of new silos should be prevented by strengthening cooperation across the organization.

The current state, the baseline should be kept up-to-date in easily accessible documentation. The CMDB information is not so comprehensive in the real world than in frameworks. The amount of integrations is huge and the environment is very complex. The baseline is the starting point of the change.

The customer demands are increasing and the new ways are sought for improving the fault management functions. The increasing complexity in network environments makes this a challenging task. The networks are constantly growing and there are large array of different network elements on the market with different standards used.

It is forecasted that the service assurance will take the more important role in future virtualized world. As IT environment also the networks are becoming virtualized which generates new requirements for service assurance. The network functions will be virtualized; the technology is called Networks Function Virtualization (NFV). At the same time also services are virtualized in Software-defined Networking (SDN) architecture where the control is decoupled from network boxes to separate controller layer. In this virtualized world the services are chained and service assurance must work in close alignment with the service chaining. In addition to current quality of service (QoS) also the quality of experience (QoE) will be measured (Järvilehto, 2014).

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Attachments

Attachment 1. Questionnaire used in information gathering from IT.



Survey Internal

Date
2013-11-05
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Document id
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Page
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Creator
Pekka Stenfors

IT Transformation questionnaire (BBS Service Assurance Area)

Date:

Interviewee:

1. What is IT Transformation?

2. Are there any alignment towards VMOST (Vision, Mission, Objectives, Strategy, Tactics)

3. What are the drivers/rationales for doing IT transformation project?

4. What are the constraints/obstacles for doing IT transformation project?

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5. What is the approach of IT transformation (Big Bang/Phased/Parallel/Consecutive)?

6. How long the IT Transformation can take?

7. Should the IT transformation project be driven internally or by a big system integrator?

8. What are the key success factors for the project?

9. What are the biggest risks?

Attachment 2. Common FM Project complexity Model

Project: Common FM
Date: 29.3.2014
Project manager profile that is required: Moderate Complexity

Complexity Dimensions	Project Profile		
	Low Complexity	Moderate Complexity	High Complexity
Size:		10-30 team members	
Duration:			1-2 years
Project Budget:		MSEK 10-100	
Technology Complexity:		Major technical modification is required AND past execution experience has somewhat been demonstrated.	
IT System Complexity:		4-10 IT systems involved	
Scope Clarity:	Business requirements and project scope defined		
Interdependencies:		There are probably unknown dependencies to and/or from a few projects or line units	
Timing Importance:		Medium business consequence if delivery time is not met, e.g. business case cannot be achieved	
Supplier Situation:	Some external or internal suppliers involved. Well established relationship and a good track record of the suppliers. Frame agreements exist with the suppliers.		
Team Structure:		Project team from more than one Business Area	
Stakeholder Complexity:		Stakeholders in more than one Business Area	
Project Importance:		Vital importance for customer and/or organization	
Governance Situation:	Clear and specific governance structure AND organizations with similar interests and expectations		
Organizational and Process Impact:		Major changes in existing processes and ways of working in target organizations	

Attachment 3. Common FM Project Set-Up Specification

Approver
TeliaSonera
TS BBS BTS IT
Jari Grönblom

Creator
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Project proposal for Common FM

Project basic information			
Project name	Common FM project – Evaluate, choose and implement common Fault Management System(/s) for TeliaSonera Broadband Services as a part of TS Roadmap Program.		
Project goal area	Strategic	Project class	IT systems
Project id			
Project owner	Jari Grönblom, TS BBS BTS IT		
Project manager	Pekka Stenfors, TS BBS BTS IT (DP0 – DP1)		
Start date (DP0)	2013-12-12	Completion date (DP5)	2015-05-31
Expenditure, total	xx MSEK		

Pre-study phase information			
Start date (DP0)	2014-12-12	Completion date (DP1)	2014-06-01
Expenditure, pre-study	83,2 KSEK		

Project description
<p>Make an evaluation of leading Fault Management systems in market place and in use solutions in BTS, select one as a common solution, and implement it to production.</p> <p>The goal of common FM Solution is to decrease the number of current FM (Fault Management) systems, harmonize the related processes with a common way of working, have a same look and feel user interface used in different countries and lower the total ownership costs for the functional area.</p> <p>Today we are running five different FM systems in the functional area. Netrac, Netcool, HP IOC, ACS-RA (included Ramida) in Sweden and Nelli solution in Finland. Even though having all these systems they only partially answer to the business requirements today.</p> <p>The systems are used for handling faults in networks. The raw alarms or events are collected, parsed, filtered, enriched towards inventories and the alert is generated and forwarded to Trouble Ticketing system if needed.</p> <p>The direct operational costs of these systems are about twenty million Swedish crowns annually. The cost per network event varies between 0,5 - 2 Swedish crown and the total amount of users is about 1000 employees.</p> <p>With one common FM Solution we could exploit volume based discount from vendor. The FM tool will be same for all users simplifying the related processes and training. The processes for managing the system will also be simplified. All general changes like IPv6 related changes</p>

must nowadays to be done to every system separately. With one common FM solution we can lower the costs in all aspects: volume based licenses, internal and external processes (FTE), development and training.

None of the existing systems can fully answer to the current requirements with the current version level. Present-day FM solution would bring us new features which are needed currently. We need to be more proactive by improving the root cause analysis from network perspective. Service Impact Analyzer (SIA) is a customer perspective of partly the same thing. SIA functionality is missing in Sweden and only implemented in Finland with SAMI/IA solution and the Ontology solution which is still in project phase. IT should be able to meet quickly the business requirements – these all requires more contemporary and flexible FM solution. FM solution is basis for event, incident and problem management processes.

We propose to start pre-study phase for the Common FM Solution project. The aim with the pre-study is to analyze current situation more deeper level, analyze candidates as future candidates as a common solution, evaluate the architecture for the common FM solution and collect business and internal requirements in high level.

1 Description of the pre-study phase

Pre-study scope

The main targets for pre-study are to analyze current FM solutions, collect in high level requirements from the stakeholders, and analyze the financial requirements. One important target as well is to evaluate target functional architecture for FM functional area, which serves the whole project. Some preliminary analysis will be done also for analyzing future candidates as common FM solution.

Dependencies

TS Roadmap program and already started and halted Common PM (Performance Management) project.

Assumptions

The business assumptions bases on the volume based discount when using one common system compared to five used systems today. Saving will be reached also from common way of working which one common solution enables. It will lower total internal and external FTE needed.

Present-day Common FM solution will better answer to the current requirements whereas the existing solution partially answers to the requirements. It will better support the current products and technologies.

Pre-study deliverables

Deliverable	Acceptance criteria	Approver
Project pre-study	The preliminary project plan is in line with the TS Roadmap program	Program manager
Pre-study report	Describes in AS-IS solutions, requirements in high level and functional area architecture	Jari Grönblom, steering group

Pre-study budget	
Opex man-hours	100
Opex SEK	83 200 SEK

Pre-study time limits		
DP or milestone	Date	Comment
DP0 Approve idea, Start pre-study	2013-12-12	
DP1 Approve pre-study, Start planning	2014-06-01	

Pre-study risks			
Risk category	Risk title	Risk description	Risk response
Project Management	Lack of PM skills	The lack of skills can lead to deviations in scope, timeline or/and the cost of the project	Careful PM selection
Project Management: Planning	Project plan and schedule	The lack of information in the beginning of the project can lead to the situation where the project is not able to be in schedule and budget, the target may also be "moving"	Adherence to Promo change management process.
Project Management: Communication	Lack with communication and advertisement (awareness campaign)	The lack with communication even in pre-study phase can have a defect to the total project leading to the project is not taking care of all essential parts and can fail with advertising the main target of the project. The failed communication can cause delays for project schedule.	Improvement of the communication plan
Organizational: Prioritization	Low prioritization	The project group consists of resources from many organizations. The prioritization for the resources on the organization might be insufficient for the needs of the project. The project is not able to be in	Preparation for escalation.

		schedule.	
Organizational: Other	Resistance to change	The employees resist change regarding the Common FM system. This can prevent the project to achieve the targets. The management commitment is missing.	Engaging people by the target (justification, commitment). Using change management methods for gaining the commitment and engagement
External: Subcontractors and suppliers	Unexpected change with the selected vendor	Some unexpected change with the selected vendor can cause long delays for the project.	Prevent action: vendor evaluation Post action: start negotiations, procurement unit needed
Implementation: Requirements	Insufficient requirements	The requirements are understood differently in vendor side. This leads to the situation where we are getting less in first phase, has an impact to the schedule and budget.	Prevent action: wide demonstrations during evaluation between vendors and users. Users involved to the springs, and usage of agile like methods during implementation.
Implementation: Complexity	Very complex environment (system integrations)	The existing surrounding environment is complex and different in different countries. This can lead to the situation where unexpected incompatibility issues occur between the surrounding and the Common FM system	Prevent action: Phased approach to the implementation
Implementation: Quality	Migration	The change on adjacent system can cause delays and costs for the integration	The freezing period of integrated systems need to be long enough

2 Organization and reporting for the pre-study phase

Project steering group			
Name	Organization	Role	Contribution
Jari Grönblom	BTS IT	Project owner, chairman	Decision maker
Pekka Stenfors	BTS IT	Secretary	Project manager (Pre-study phase)
N.N.	BTS IT	Member	Processes & Architecture

N.N.	BTS IT	Member	TS Roadmap Program manager
N.N.	IMC	Member	Stakeholder
N.N.	Customer Operations	Member	Main user
N.N.	Networks	Member	Stakeholder

Project team for pre-study phase			
Name	Organization	Role	Contribution
N.N.	BTS IT	Member	Specialist (IT FM)
N.N.	BTS IT	Member	Specialist (IT FM)
N.N.	IMC Karlstad	Member	Stakeholder
N.N.	IMC Jyväskylä	Member	Stakeholder
N.N.	BTS Networks	Member	Stakeholder
N.N.	Product & Services	Member	Stakeholder
N.N.	TSIC	Member	Stakeholder
N.N.	BTS IT	Member	Specialist (IT PM)
N.N.	BTS IT	Member	IT Architecture

Reporting and communication				
Who reports	To whom	What and format	How	When
Project Manager	Steering group	Decision material for the steering group meeting	By email or via work room	2 work days before the meeting
Project Manager	Project owner and steering group, TS Roadmap program	Progress report (word document)	By email or via work room	Monthly
Project Manager	All relevant interest groups	Written project documentation	Via work room	Up-to date work room

3 Other important issues to be taken account

None recognized.

4 Appendices

Appendices	Link of the document
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