Kaisa Korkalainen

Improved IT Change and Release Management Process

It all started with a small idea that grew bigger in time and now ends up to writing the last words to my Thesis. This has been a long journey filled with both laughter and tears, joy and despair. Even though at times the road was rocky this adventure has been well worth embarking and I can be proud of what I have achieved during this year.

I'm grateful for this Master's program for allowing me to learn new things and meeting all the new people in our class. This program has not only given me new skills, but also it helped to learn things about myself I did not know even existed before. I want to give special thanks to Dr Juha Haimala for the guidance on writing this thesis and at the same time helping to understand that it is not so serious. Also thanking Zinaida Grabovskaia for the pinch of salt advice and comments to bring the thesis to its current format.

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This Thesis would not be finalized without the help from our whole class. The WhatsApp group brought peer support needed for finishing this work, even though at times it may have brought more pressure than hope, but still without it this process would not have been as much fun as it was. Special thank you goes to the other KONE lady – Niina Aho. Having almost daily peer support available has been priceless.

Last, but definitely not least I want to thank my fiancée Anne for allowing me to be in the world of my own for a long period. Thanking also my family and friends for the support they have given through this journey.

Kaisa Korkalainen
Espoo
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This Thesis aims to improve the change and release management process within an IT organization in a large manufacturing company. The current change and release process works, but not as optimally as it could. The change requests created by the business users for changing something in the IT solutions, but due to lack of transparency in the process they do not get the information when the requested change will be released to production, if released at all.

This study is done as case study where data is collected by conducting interviews within the case organization, studying the results of past IT satisfaction surveys and discussion ongoing in Yammer, company internal social media. A literature review is conducted for finding best practices for creating a conceptual framework for eliminating the weaknesses identified with the data collection.

The study results in giving ideas for how to improve the weak points by improving the process flow, building set of KPIs and adding more transparency and communication to the overall change and release management process.

The findings will be utilized in the case organization both in short term and in long term as some of the improvement proposal ideas need an implementation of a new change management tool as current tool does not support the functionalities needed for the implementation. As the case organization is already planning on implementing a new tool, the improvement suggestions can be used to help with the implementation.

Keywords	Change management, release management, process flow improvement, KPI, process communication, transparency

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1   Introduction

> *"It is not the strongest of the species that survives, not the most intelligent, but the one that is most responsive to change. Your ability to transform in itself will be a key driver of competitive advantage." (Anonymous)*

Information Technology is gaining an ever more significant role in the companies today. Big part of companies' operations are run on some kind of computer application. The applications do not stay the same throughout their lifecycle but the changing needs of users bring new requirements to them. In this situation it is important that any changes done to the applications are done in a controlled, transparent and well-documented way.

To respond to this need, IT frameworks, like ITIL have been developed to help the companies to talk to each other in the same language. These frameworks also have specific sections written on how changes can be managed. However, even with the frameworks available, the practices are not always fully implemented in the companies which may lead to over complicated processes. The aim of this thesis is to tackle one of such challenge and to improve the processes in one company.

1.1   Key Concepts

The key concepts for the study include the following terms:

Change Management   ITIL foundations defines the scope of Change Management to cover changes to Service Portfolio and configuration items across the whole Service Life Cycle. (ITILFND05 05-5)

Change   "A change is the addition, modification or removal of authorized, planned or supported service or service component and its associated documentation." (ITILFND03 03-20&21) Changes can be defined to three different types

based on their priority: Normal Change, Standard (pre-authorized) Change and Emergency Change.

Release Management   ITIL defines the objectives of release management to establish clear and comprehensive release and deployment plans that enable the customer and business change projects to align their activities with these plans. (ITILFND05 05-6).

Release   There are no guides in ITIL what kind of releases there can be within an organization. The releases in the case company have been divided to five types depending on how often the release occurs and the change type that the release is linked to.

1.2   Business Context

The case company in this study is KONE Oyj. The case company is an over 100 year old family owned company manufacturing elevators, escalators and automatic doors. The company operates in almost 80 countries with nearly 50000 employees. The case company operating model consist of five different elements: managing the relationship with customers, delivering products and services, conducting maintenance, creating new solutions and managing and supporting the business. These elements are also known as KONE Way and there is a global team that makes sure all the units are following the processes. The case company is divided into different business units, like New Equipment Business, Service Business and Global Functions, for example Innovation and Technology department. The business unit structure is based on the company operating model. Each unit works on one or multiple processes, depending on the function of the business unit.

The case organization of this study is the case company's IT department, which makes part of the case company's Innovation and Technology department. IT department is divided to different IT Solution Teams based on the company operating model and infrastructure needs. Each company operating model element has a corresponding IT Solution team to develop and support solutions for their specific needs. There are also two teams that take care of the infrastructure and platforms that are common for all the IT

Solution teams. As part of normal IT Solution life cycle these solutions need changing based on new requirements from the business units. KONE IT has defined processes for bringing the requirements to a change that can be released to use. The current change and release processes are very rigid with heavy approval process even for the simplest changes.

The case organization is in process of updating its whole operating model. This is a three year program that started with developing the project management and service management processes first as those have the biggest impacts to the end users. Improving the change and release process is part of this program. This study will support the improvement work done in the program.

1.3   Business Challenge, Objective and Outcome

Presently there are issues in the change and release management process in the case organization that need to be investigated and improved. For example, the changes get approved based on intuition instead of systematic, streamlined evaluation of impact of the change. This may partly happen due to the fact that there are no specific resources allocated to the change work, but the same resources are used also for project related tasks or support work. Next, there are challenges with prioritization. The projects have tight deadlines and support work gets prioritized, so that the change work is done when there is any time left. Due to the lack of systematic prioritization the changes are not done in order of priority but as the person working on the changes chooses to pick from the list. Also there are no unified change schedules. As a result, the business units may not have a clear understanding when their changes are released, if at all. Thus, in spite of otherwise mature and effective IT processes in IT department, these challenges put changing needs of case company business at risk and need to be improved.

Accordingly, this study aims to improve the change and release management processes in the case company IT department which currently lack systematic procedures related to change and release management.

The outcome of the study is an improved process for change and release management that would relate to the majority of the change and release work at the IT department that currently have some gaps in implementing the processes. The outcome of the Thesis includes the process maps and descriptions for the improved processes, as well as

recommendations how to put them in practice so the organization can immediately implement the improvements.

1.4   Thesis Outline

This study is written in 7 sections. Section 1 in this study provides the Introduction. Section 2 describes the methodology and material used in this study, while Section 3 conducts the Current State Analysis and reports on the results as for the change and release management in the case company. Section 4 discusses available knowledge and best practice in change and release management and other areas that can provide some critical input for building the improvement proposal, pooled together in the form of conceptual framework. Section 5 builds a proposal for the case company and Section 6 validates this proposal. Finally, Section 7 provides the discussion and conclusion to the study.

2   Method and Material

This chapter introduces case study as the method that is used for doing the research. The chapter also discusses how the data is gathered for the study and the criteria that is used for evaluating the validity of the research.

2.1   Research Approach

The research method selected for this study is case study. Case study is a good method for getting an in depth understanding of any real-life phenomenon. (Yin 2009) A case study is a linear, but iterative approach to studying the topic. Linear means that the study flows from one step to another, however it may return to the previous steps during the study to iterate what was found in that part. The case study process flow pictured in Figure 1.
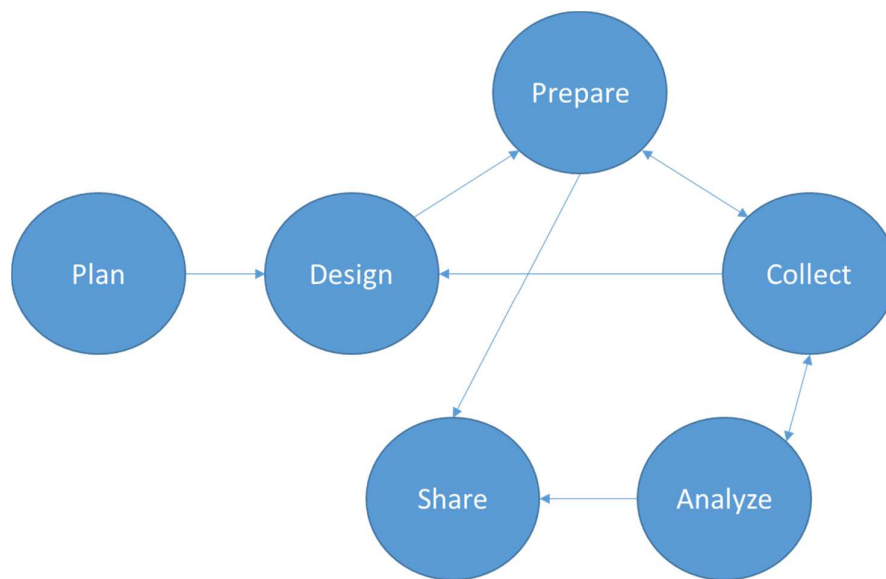
Figure 1: Case study process flow (Yin 2009:2)

As pictured in Figure 1, a case study starts from the planning phase where the objectives of the study are defined. Secondly a design phase determines how the study will be conducted. This is followed by preparation and collection phase to get an understanding what data will be collected, how it will be done and eventually collecting the data. The two last points are analysing and sharing. The data is analysed to understand what the data gathered in the previous step is telling and concluding it into findings. Eventually the study results are shared. (Yin 2009)

The data used in a case study is usually qualitative. Qualitative data is "descriptive and inferential in character and, for this reason, often seen as 'soft'." (Gillham 2010) While collecting the data "a key approach is using numerous and highly knowledgeable inform-ants who view the focal phenomenon from different perspectives." (Eisenhardt and Grae-bner 2007) Qualitative data cannot used for statistical analysis but it is often used for finding patterns and common nominators in the process. While a case study often con-centrates on finding solutions or improvements to the negative patterns identified during the study, it is also important to highlight the positive findings, which make an important part in the investigation of a study. As this study fits into the logic of a case study, this approach was selected.

In this study, which deals with process improvement, the approach is to identify the is-sues or gaps in the process and to find references from already existing cases in litera-ture for building a theory. As typical of a case study, it does not always follow the same structure. Sometimes it is needed to study the literature before conducting the case anal-ysis in order to find out what part of the case to investigate. When it is clear what needs to be investigated, the next step is to start analysing the current state of the case based on the data collected for the study. As typical of a case, study, this Thesis mostly relies on the analysis of the qualitative data. The data used in this Thesis is discussed in the next sub-section.

2.2   Research Design

Every research starts with a plan – a research design. The research design of this study identifies all the steps done along research process and helps to highlight the activities don, as well as the data collected and the intermediate outcomes, from each step. Re-search design for this study is pictured in Figure 2 in the next page.
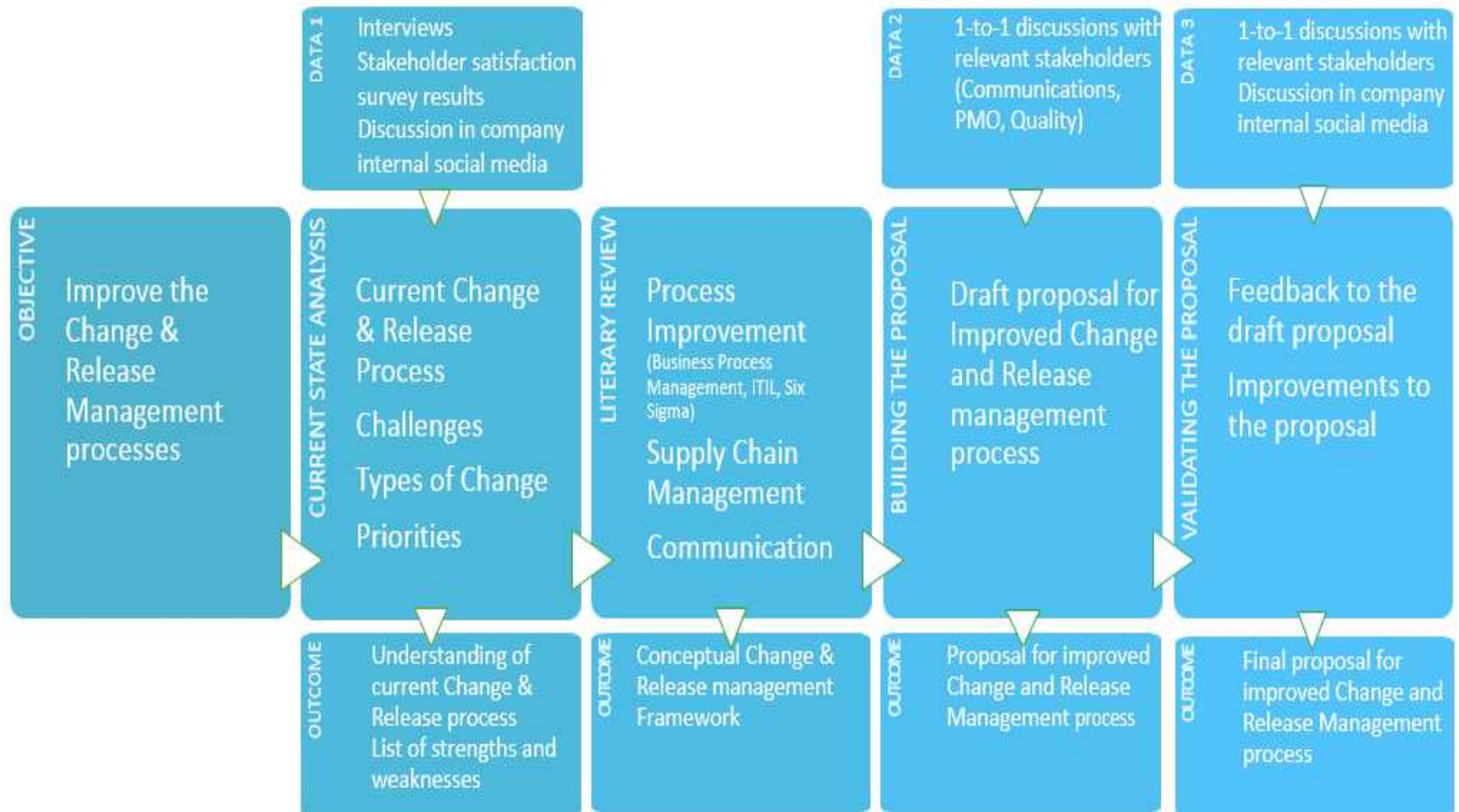
Figure 2: Research design in this study

As shown in Figure 2, the research design starts with setting the objective of the thesis – to improve the change and release management processes at the IT department.

The Current State Analysis aims to understand the current state of the change and release management processes today. The data in current state analysis phase is collected by conducting interviews with different key stakeholders and also by investigating the results of a yearly IT Survey with IT end users from October 2016. The case organization also has a lively discussion ongoing related to the change and release management in a forum dedicated for change and release process improvements in the company internal social media Yammer. Part of that discussion is also used to understand the current state of the process.

The next step in research design, Literature Review, concentrates on finding models for solving the main issues identified in the in the current state analysis. The literature used for this step are different process improvement frameworks, like Business Process Management, Supply Chain management and ITIL as well as documentation related to project communication for improving the overall process flow. The outcome of the literary review is a conceptual framework for the change and release management.

After the current state analysis and the literature review, the key challenges and key suggestions for solution buildings become identified. Both these steps make the foundation for the building of the proposal to improve the process together with experts within the case organization.

The final step is validation of the draft proposal from the previous step. The proposal is validated with different stakeholders to make sure that the proposal is valid. This is done through discussion with the key stakeholders and opening the proposal for discussion in Yammer for all interested parties.

2.3   Data Collection and Analysis

This study relies on three different methods of data collection. First, most of the data comes from the interviews and discussions conducted with different key stakeholders. Second, the data from an IT end user satisfaction survey is used to get the voice of the business users heard. Third set of data comes from following a discussion about change

and release management in the company internal social media Yammer. The data collection for this study is shown in Table 1.

Table 1: Data collection details (Data 1-3)

	Data type	Participants / role	Topic, description	Date	Duration	Documented as
	Data 1					
1	Face to face interview	Respondent 1: Head of PMO	Change and release management in KONE IT in general	Jan 2017	30 min	Field notes and recording
2	Face to face Interview	Respondent 2: Release manager for IT Solution 1	Change and release management for IT Solution 1	Jan 2017	55 min	Field notes and recording
3	Phone Interview	Respondent 3: Area director	Change and release management in KONE from business point of view	Jan 2017	50 min	Field notes and recording
4	Face to face interview	Respondent 4: Change and release management specialist	Change and release management in KONE IT in general	Jan 2017	25 min	Field notes and recording
5	Face to face interview	Respondent 5: Solution owner for IT Solution 2	Change and release management for IT Solution 2	Jan 2017	45 min	Field notes and recording
6	Face to face interview	Respondent 6: Global Process Owner	Change and release management in KONE from business point of view	Jan 2017	40 min	Field notes and recording
7	Face to face interview	Respondent 7: Head of IT Solution team	Change and release management in KONE IT in general	Jan 2017	35 min	Field notes and recording
8	Phone interview	Respondent 8: Quality manager for IT Solution 1	Change and release management for IT Solution 1	Jan 2017	45 min	Field notes and recording
9	Phone interview	Respondent 9: Platform owner for IT Solution 3	Change and release management for IT Solution 3	Jan 2017	55 min	Field notes and recording
10	Face to face interview	Respondent 10: Head of Computing	Change and release management for infrastructure	Jan 2017	35 min	Field notes and recording
11	Phone interview	Respondent 11: Consultant	Change and release management for infrastructure	Feb 2017	40 min	Field notes and recording
12	Survey	IT End user satisfaction survey open for the whole company	How IT can support the changing needs of business	Oct 2016	-	Survey results analysis
13	Discussion on company internal social media	IT department employees	General discussion about change and release management	Dec 2016-Jan 2017		

	Data 2					
14	Phone discussion	Respondent 1: Senior Communications specialist	Communication within change and release process	Apr 2017	30 min	Field notes
15	Face to face discussion	Respondent 2: Change and release manager	Process flow and KPIs of change and release process	Apr 2017	60 min	Field notes
16	Face to face discussion	Respondent 3: Quality expert	Continuous improvement in change and release process	Apr 2017	50 min	Field notes
	Data 3					
17	Phone discussion	Respondent 1: Head of PMO Repondent 2: Change and release manager	Discuss about the proposed process improvements	Apr 2017	35 min	Field notes
18	Discussion on company internal social media	IT department employees – targeting interviewees from Data 1	Future of the change and release management in KONE IT	Apr 2017	-	

Data 1 for this study is gathered to get an understanding of how the change and release management currently works in the case organization. As shown in Table 1, Data 1 consist of mostly of interviews conducted with different key stakeholders who are familiar with the change and release management processes, like Release Managers, IT Solution Owners or Business Process Owners. The interviews were done both face-to-face or on phone, depending of the location of the interviewee. The interviews were recorded and field notes were gathered based on the interview notes and recordings. The interview questions are shown in Attachment 1.

The case company IT department runs an annual survey to find out how satisfied the IT end users are with the services IT department is providing. One section in the survey covers questions about the changing needs of the respondent's department and how IT is able to respond to those needs. The latest IT survey was run in October 2016 and it received an all-time record amount of responses – almost 7000. The responses included both numerical evaluations and almost 6500 open comments. The results have been validated by IT department's quality team and all teams in IT department have had their own result review sessions to identify corrective actions to improve the services. The open comments related to questions about change and release process are used as

Data 1 to get a wider angle from business units on how the change and release management currently work. The change and release related survey questions are shown in Attachment 2.

Third part of Data 1 collection is to follow the discussion in Yammer, company internal social media.

Data 2 for this study draws together the suggestions for improvements related to change and release management. Data 2 points to what would be the desired state for the future of change and release management. In Data 2 collection, the interviewees identified what could be done to improve the process and other related questions. The interviews were conducted as informal discussion. The interviewees selected for the Data 2 were experts in the topics identified in the literature review. Their expertise will help building the proposal.

The Data 3 consist of discussion with the head of PMO and a change and release manager to for getting a first validation of the proposal created based on Data 2. After the discussion the proposal will be open for discussion in the company social media Yammer. The discussion is open for all employees using the social media but it will be especially targeted to the interviewees that were interviewed while collecting the Data 1.

Next section discusses the change and release management in IT department at the case company.

3   Current State Analysis

This section analyzes how the change and release management process is currently working in the case company. After the case company introduction, the change and release management process is introduced followed by the findings from the data collected. They identify the strengths and weaknesses of the process.

3.1   Overview of Current State Analysis

Although change and release management processes are two different, but interlinked processes, those are usually considered to be one process as there cannot be releases without change requests and no change process is complete if there is no release to deploy the changes. The current state analysis in this study is conducted in three steps: first, the change management process is explored; second, release management process is investigated, and third, the IT roles for the combined change and release management process are analyzed. The results are summarized into the strengths and weaknesses of the current change and release management process. The data used in this section is based on interviews, survey results and internal discussions in the company.

First, the current state concentrates on getting an in-depth understanding of the complex content of the change and release process. The case company set up a centralized IT organization some 15 years ago. The history of IT change management in the IT organization is almost as long. There are many people in the case company that have been with the company already at that point. There is a lot of knowledge with both business users and IT employees of how the process has been working through the years.

To get an understanding of the history and the current state of the change and release management, a series of interviews was conducted with people both on business and IT areas. Among the interviewees were the people who have been long in the company but also some who have only started recently. The people with long company experience were able to give more input on how the process has been working through the years and also how the process has changed in time. The interviewees who had joined the company only recently were selected as they have experience in change and release process from other companies. They were able to point out things that were not so obvious to people who have been working with the same process for a long time.

The interviewees were selected partly based on their roles that were closely linked to the change and release process. Some were selected based on their active commenting in Yammer. To get a full view of the process interviewees were selected from both business and IT side and also from managerial and operational level.

Second, the open comments of the annual IT survey were analyzed from the change and release process perspective and the related comments have also been included into the analysis of the current state. The IT survey results are investigated to get a better understanding of the business user's opinion of the current state of the change and release management process.

Third, the discussion about Change and Release management in company internal social media was followed to make sure that any relevant topics that have not come up during the interviews or survey results are also not excluded from the current state analysis.

3.2 Current Status of Change and Release Management Process

For the case company business to be able run their operations with the changing business needs that may require a change in the IT solutions they use. For getting those changes done, there needs to be a channel between the business and IT departments where the changes can be requested.

3.2.1 Change Management Process in KONE IT

The changes done in IT can be originated by three different functions. First type includes the change requests that are originated by business and related to changing a business process or functionalities in some IT Solution. This kind of changes can be related to an ongoing project or created as part of continuous development. Second type of changes are related to the IT infrastructure and originated by either IT infrastructure support teams for security patching of servers, version upgrades and continuous development activities or by projects developing new business applications who need the infrastructure built for the application. Third type of changes is related to bug fixing. If a functionality is not working in an IT solution or the entire system is down the users can contact a Global Service Desk for opening an incident ticket to the support organization. In order to bring the needed fix to the IT solution a change request is created.

The change requests are divided to three types based on the urgency of the change needed. The most complex of the three change types is the normal change that has not been pre-approved. The current state of normal change process is described in Figure 3 in the next page.
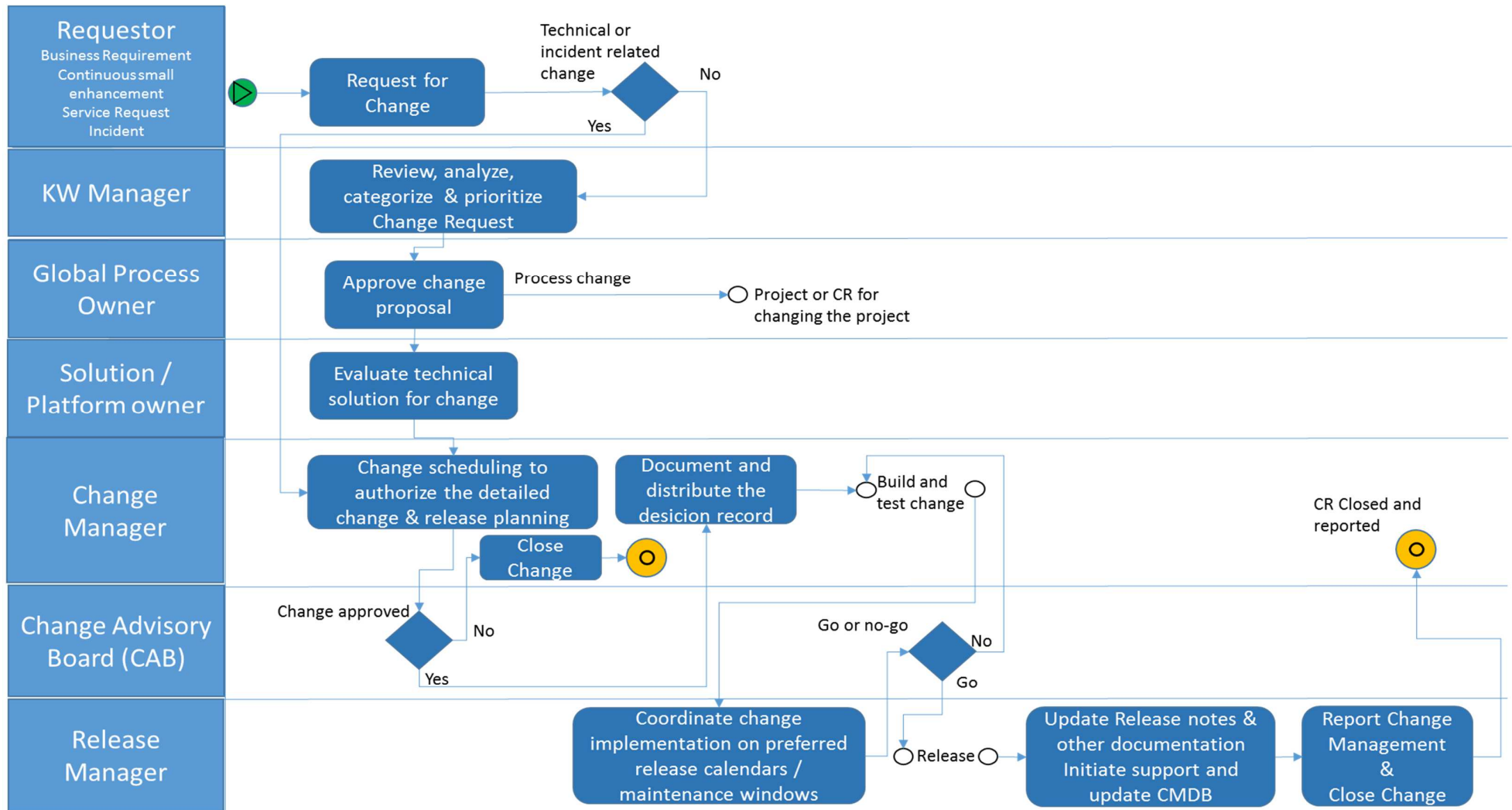
Figure 3: Current state of normal change

If a normal change is based on the request from business it will go through the approval process, which currently consists of quite multiple steps. If the change request is related to a business process change it will not come to IT department, but will be further developed by the department in charge of the business processes in the case company. If the change is IT related and passes full approval process it will move to prioritising and development phase. Once the change is developed and tested to be ready for deployment it will go through last approval round before it will be deployed to production environment.

The other two change types are not as complex as the first type, but they have their own special features. The standard change is the most simple of the three change types. Standard changes usually are related to data customizing or data refreshing in lower operating environments that contain very low risk for production environments when implemented. For that reason the standard changes can be pre-approved and deployed to production as soon as the development is done as shown in Figure 4 in the next page. If approval is needed, it will only require the solution owner's approval.
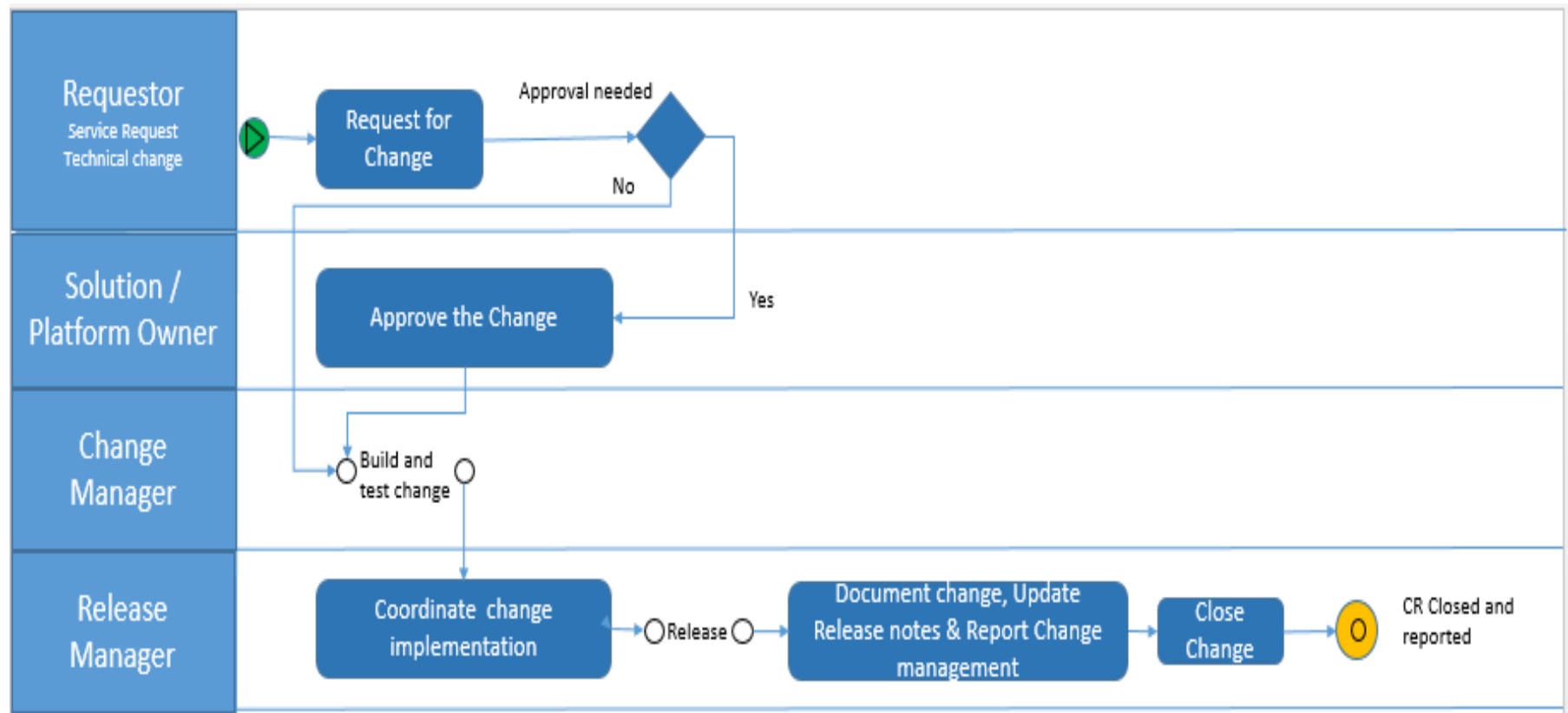
Figure 4: Current state of standard change

The third change type – Emergency Change - is the most critical for the business continuity. It is always linked to an outage in a production environment and it needs to be brought back as soon as possible. As shown in Figure 5 in the next page, the development work does not require any approvals, only when the development is ready there will be an approval given by experts who have validated that the development will fix the issue before deployment to production.
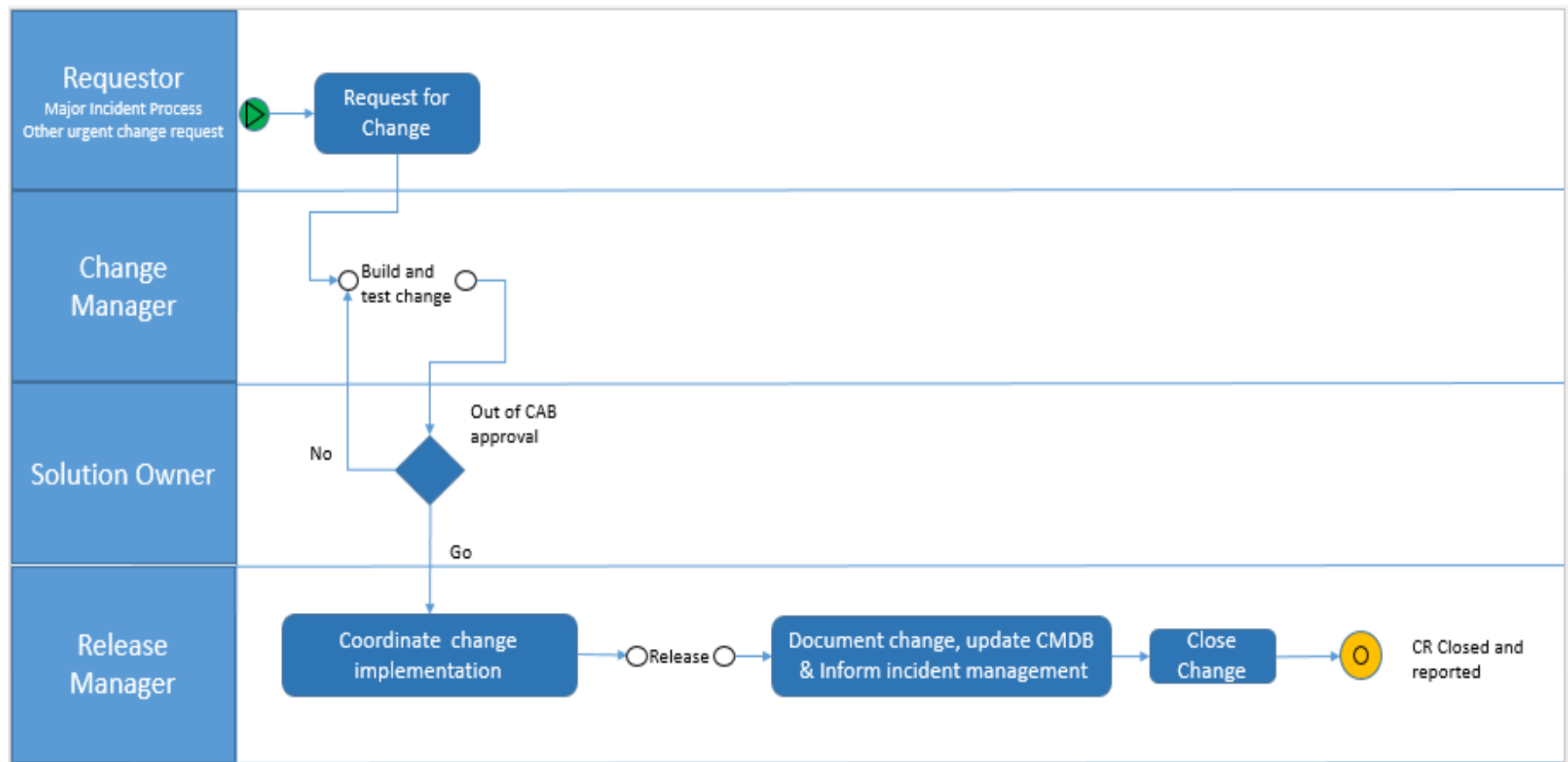
Figure 4: Current state of emergency change

If there is a business interruption and the IT solution no longer works as intended after a badly deployed change request, emergency changes can also be used for rolling back the development from production environment.

Although there is quite a clear understanding about the change management throughout the KONE IT, there is no one common way for doing release management, known also as deployment management. The next sub-chapter discusses the different types of releases and how those are linked to the Change Requests.

3.2.2 Release Management Process in KONE IT

A change is always related to a release for deploying the development done to the IT Solution into a production environment. At the case organization there is no one way for scheduling the releases, but different solutions have identified their own release schedules that best apply for the specific needs of the solution. There are five types of releases depending on how often the release takes place.

Major release	Takes place 3-4 times per year. Most of the normal change requests are deployed to production in major releases.
Mini (extra) releases	Monthly releases that mostly deploy changes related to project related change requests, small enhancements or by-passes from major release.
Minor release	Weekly releases that are used for deploying (non-major) incident development to production environment.
Standard release	Linked to standard change requests. Daily releases for bringing low-risk changes to production.
Emergency release	Linked to emergency change, takes place when needed. Emergency release process is sometimes incorrectly used for by-passing the normal CRs to production environment outside the release schedules.

Within the IT solutions supported by the case organization there is only one IT solution – SAP – that has a release schedule that contains all different release types. The SAP release schedule pictured in Figure 6 shows how the different schedules take place during a calendar year.
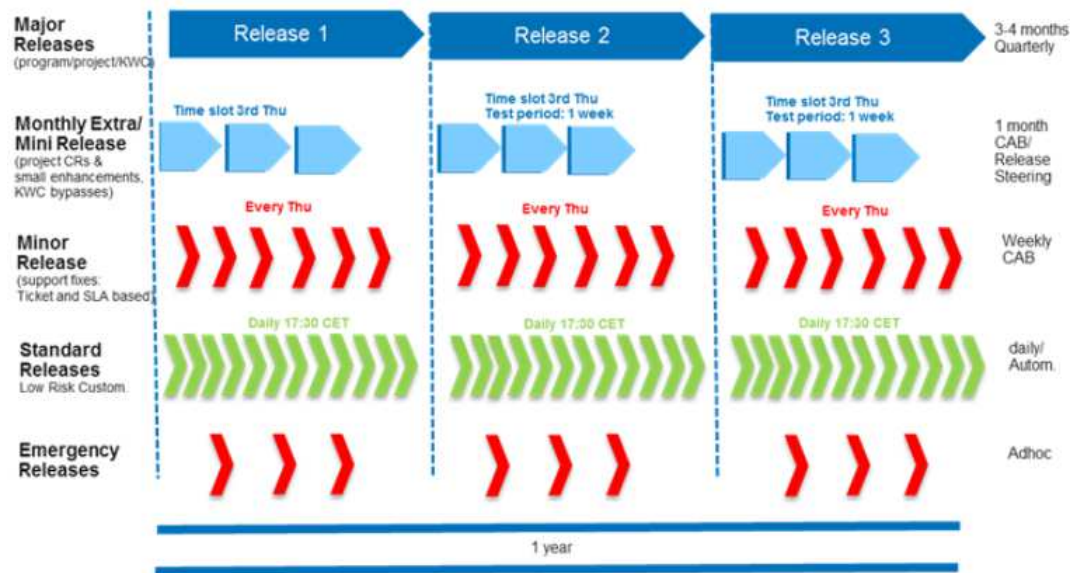
Figure 6: Current release schedule – based on SAP release schedule

There are many other IT solutions are integrated to SAP. For practical reasons the releases for the integrated IT solutions quite often follow the SAP release schedule to ensure that changes that are needed in both IT solutions will be deployed around the same time. While quite many IT solutions have some kind of release schedule defined, there are also some IT solutions that are not able to define the release schedules within the case organization. Those are the IT solutions where either the platform or the whole solution is purchased as a service. Although many areas in the IT department currently have the release schedules defined, there are still areas that do not have any release schedule in place but the changes are deployed to production without much control or consideration what kind of impact it may cause to the business.

3.2.3 Roles in Change and Release process

The roles in the change process there are both business and IT side. Each role has their own function in getting the change request moving forward all the way to the release and closure.

Requestor   Anyone can request for a change – the change can be related to a change in a functionality for a business application or related to a technical change. Depending on the need for change the requestor can be either from business or IT side.

KONE Way Manager   KONE Way Manager creates the change requests, evaluates the business need and the benefit that the requested change will bring. This role is the contact between business units, IT department and the business process team.

Global Process Owner   Each of the company operating model element consist of multiple business processes. For each of these business processes there is an owner. All the changes come first for Global Process Owner's approval. If the approved change requires a business process change, it will be sent further for the business process team. IT related changes will be sent to forward to the Solution Owner. The Global Process Owner can also reject the changes.

Solution Owner   The IT Solutions are owned by a Solution Owner who is responsible for the technical and functional capabilities of the solution, making sure that the solution is aligned with the business processes. Solution Owner can either approve or reject the change.

Change Manager   Change Manager authorizes schedules the change for development and makes sure all the documentation needed for the change is in order. Change Manager also closes the

changes either once they have been deployed to production in the release or when they are rejected and not developed. The role of Change Manager is not usually only role for the person. Quite often it is combined with the Release Manager role, but it is also possible that the Solution Owner role is combined with the Change Manager role.

Change Advisory Board

CAB – short for Change Advisory Board consists of experts who have a full picture what impact the change can have to existing production environments. CAB approval can be given in case there is no Solution Owner – especially in case of changes to IT infrastructure. CAB can also approve the deployment of a developed change to production prior to a release. At that point the CAB makes sure that the development has been tested properly and is ready to be deployed. If the changes are developed by external suppliers CAB is a good tool also for making sure that what is delivered is what was requested. There is usually no need for two CAB approvals before the change is deployed to production but the final decision is taken at either point of the change process. In the case organization the CAB does not exist in all areas. It is mostly used with the technical changes, but also some IT Solutions do have the CAB practices in place.

Release Manager

Like the role of Change Manager, Release Manager is not usually a one-person role, but it is combined to other roles. Whether the change is deployed to production in a major release or through emergency release the Release Manager is fully aware of what is happening. Release Manager also documents all the changes deployed in each release to the release notes as well as makes sure that the changes are recorded to Configuration Management Data Base (CMDB), informs support functions of the new features and let's Change Manager know the change can be closed.

All roles are needed at some point of the change and release process, but how the process is currently moving from one role to another is not the best possible. The challenges of the different roles will be discussed in the further chapters.

3.3   Change and Release Management Process Strengths

When discussing with the interviewees they were mostly agreeing that the current change process works. In year 2016 over 1500 changes were deployed to the production. That is almost twice as much as in the previous year. Also the things that are deployed to production by following the existing change and release process generally are functioning as they should. As shown in Table 2 for SAP, after a release there are only few incidents and even fewer major incidents.

Table 2: SAP defect statistics after a release

#	2016	2016	2016	2016	2016
Month	**CR**	**REL**	**total TRs/CTS**	**Test defects**	**HyperCare defects**
June	283	985	**1225**	47	7
July	N/A	N/A	251	N/A	N/A
August	N/A	N/A	241	N/A	N/A
September	25	63	285	1	0
October	358	915	**1101**	46	5
November	60	101	285	3	4
December	44	126	299	7	3
Grand Total	**1012**	**3514**	**6189**	**160**	**19**

The data in Table 2 indicates that with the release process in place the number of Hyper Care defects i.e. issues in production environment is considerably small considering how many transactions are moved to production in a month. Many defects are identified during the testing period and fixed before releasing them to production. This indicates that in the areas where the development, testing and deployment approval process is in use, it seems also be working. Although the Table 2 only presents the status of one IT Solution, similar trends came up in the interviews with the IT Solution owners, even though no statistics are available for those.

One interviewee also mentioned that the throughput time of a change request has been improved from the past, which shows that the process is in general getting better. It is however not known what is causing the improvement in the throughput time. One estimation is that many change requests have been linked to a project that has dedicated resources working in the change requests.

For the technical changes an interviewee mentioned:

> *"Changes get approved in a timely matter and supplier no longer reschedules the changes without a reason. Customer focused people are now in charge of the process and questions are answered."*
>
> *Interviewee 11*

For the technical changes a best practice was introduced during the interview that is not in use with the other teams. The IT Consultant running the change and release process in the infrastructure side mentioned that they have developed a practice to have a re-CAB meeting after each release where they go through what was done with each change request that was part of the release. This is a learning opportunity for parts in the release that have not gone as planned but also for the changes that did not have any issues.

Overall the strength of the change and release process is that it works. However, by improving the weaknesses identified during the data 1 collection the process can work more efficiently and transparently.

3.4   Change and Release Management Process Weaknesses

The change and release process weaknesses are somewhat different if they are related to the changes in the process or to an IT solution or to if they are technical changes. Also the different change types have their own challenges. Even though the normal change request process seems to have the most room for improvement, the standard and emergency changes are not working as ideally as they could either.

3.4.1   Resourcing

The resources working in the build and test phase of the change process are quite often working also with incident management as well as with work done on IT projects. Work on incidents takes priority and project work is depending on the project schedule so the resources are only able to work with change requests when there is time from the other two. The topic about resourcing is well known both on IT teams and business side as the concerns about the resourcing has been raised both in the interviews and in the IT Survey results.

3.4.2   Change Process Flow / Approval Process

The normal change and release process is very complex, already the approval process can at worst have three different approvers before the development work on the change can start. The Global Process Owner approves all the requests coming through the change process. There are no targets in what time the requests should be approved but it is up to the GPO's own activity how fast the changes get approved. If the change is fully IT related the GPO only acts as a rubber stamp and the change request moves to Solution Owner for next approval.

Only at the Solution Owner approval there is the first check if the request is feasible to do or if the requested change is actually something that already exists but the requestor has not been aware of. Final approval phase is the CAB approval, which can be take already before the development phase, a practice with some external suppliers. In most cases, the CAB approval is given after the development and testing is done to verify that the development has been properly tested and will not cause issues when deployed to production. Even though the approval section is the biggest bottleneck in the change and release process, there is room for optimizing in the overall process flow.

3.4.3   Prioritization

Change request prioritization takes place once the approvals have been done. The solution owner may have some idea what is the needed priority of the request, but that is not necessarily aligned with the business' expectations. If a change request is approved for development, but not assigned to any release there is a chance that it will stay open in the queue for a long time. The developer may pick from the approved queue the change requests that seem most interesting and not in order from oldest to newest. The issues in the prioritizing area have been identified and there is a plan to develop the prioritization in the way that the business can get their voice heard already before the approval round for the change request starts.

3.4.4   Unclear Release Assignment

In best case scenario, a change request is already assigned to a release before the development phase starts. This would ensure both the developer and the user waiting

for the change in the IT solution of the schedule. There are however quite many cases where the change has not been assigned to any release and the need for deployment comes at once when the development is ready. This means in practice that for quite many especially project related changes the emergency by-pass is requested instead of fitting the change request to a smaller weekly release. According to the interviewed Release manager there are cases where the emergency by-pass is mandatory as the development must be in production on some specific day. However, this should be more an exception than a rule due to bad planning.

3.4.5 Communication and Transparency throughout Change and Release Management Process

When the business user creates a change request, the request starts the journey towards the end where the change is developed and deployed to the production environment. Between the start and end the requestor has very little, if any visibility to see where the request is proceeding.

> *Shared longer term (change) planning and communication on changes to happen with key stakeholders in units would be critical. There has been a lot of discussion on this, but the changes haven't been very visible yet.*
> *Answer from the yearly IT Survey*

3.5 Key Findings from the Current State Analysis (Data Collection 1)

Currently, the change and release process consists of many steps and there are multiple roles involved until a change request is deployed to production for the IT end users to benefit. Each step may contain both strengths and weaknesses that can either make or break the process. The main strength of the change and release process is that it does work. There is no need to start developing the whole process from beginning but with removing the root causes for the weaknesses the process will deliver the changes in shorter time and on day that is communicated to the users already in the beginning of the change request's life cycle.

During the Current State Analysis five weaknesses were identified. The most complex of the change types – normal change contains all of these five shown in Figure 7 in the next page.
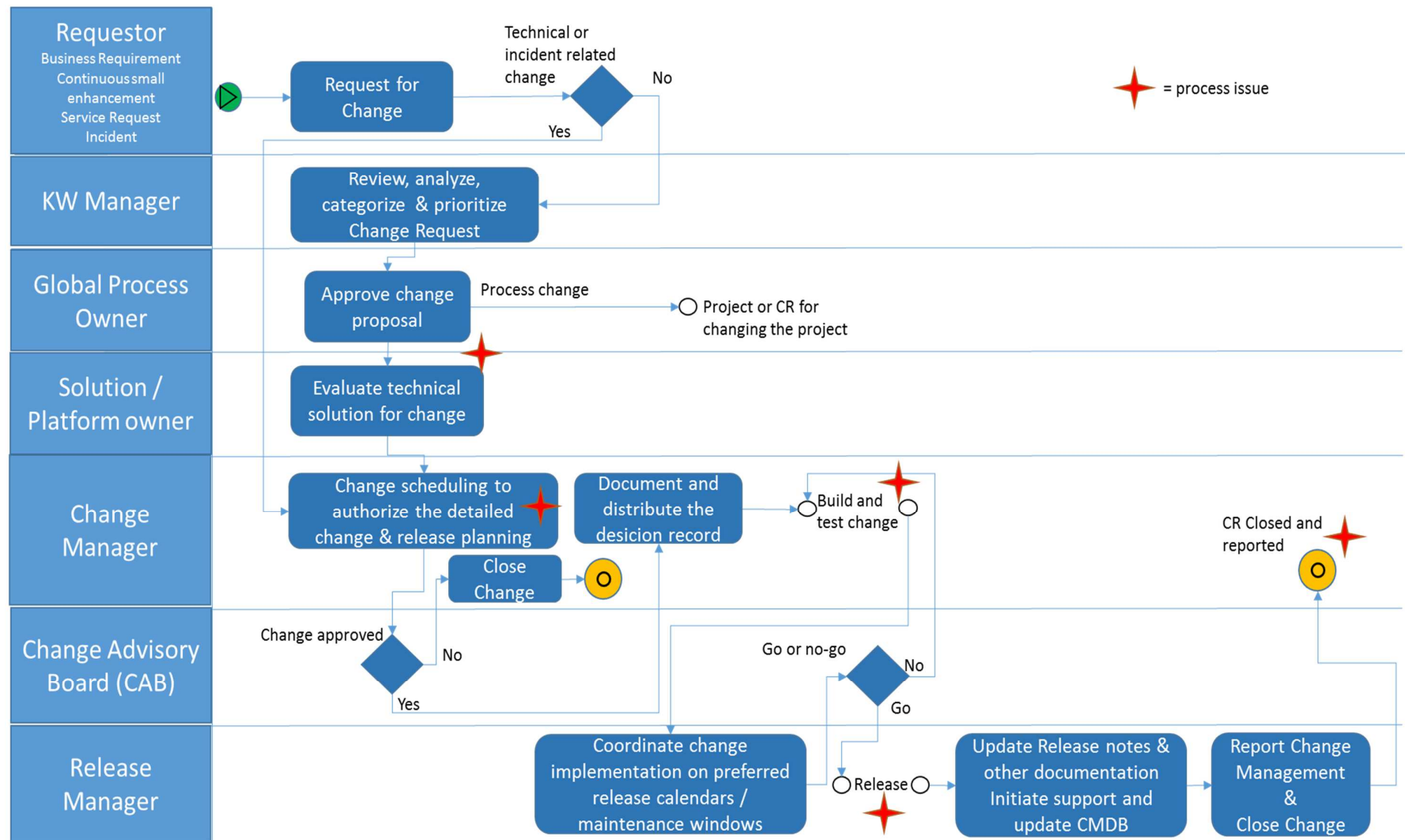
Figure 7: Normal change process flow with process issues

The other two change types – standard change and emergency change do not contain all the weaknesses, as those processes are much more streamlined from the normal change process. For the standard changes the similarities with normal changes are resources in build and test phase and communication in the end. For the emergency change the issues are in the communication phase of the process.

For two of the identified weaknesses – resourcing and prioritization, there is already ongoing activities within the IT organization. For that reason those weaknesses will not be fixed as part of this study. The weaknesses selected as the focus for this study are *Approval Process, Unclear Release Assignment* and *Communication and Transparency* trough the Change and Release Process.

To find solutions for the three weaknesses a literary review is conducted.

4 Best Practice for Improving the IT Change and Release Management

This section discusses the best practices in literature to help find solutions for the three weaknesses identified in the current state analysis. The literature research covers three topics. Firstly the process improvement, which will help to tackle the non-functioning parts with the overall process, including the approval process. Secondly the best practices are investigated in Supply Chain Management to help eliminate unnecessary steps in the Change and Release process. Third topic that the literary review covers is Communication to help improve the communication issues throughout the process and especially at the end of the process. Together the three topics help to identify a conceptual framework to remove the weaknesses in the process.

4.1 Process Improvement

A process has many definitions, in short it is a series of activities that aim to some specific result. Post Office Counters Ltd defines a process as "A related series of actions directed to the achievement of a goal that transforms a set if inputs into desired outputs, by adding value." (Zairi, 1997:64) Yet quite often process is "thought of as a series of interrelated activities crossing functional boundaries with inputs and outputs." (Armistead and Machin, 1997:886) A process thought of as one entity that consist of multiple parts. This kind of process view allows organizations to be more flexible meeting changing demand from outside the organization. It can also help to improve the consistency and capability of a product or service and with that improve the process quality. (Armistead and Machin, 1997:886)

In general a process is considered to be as weak as its weakest part. By improving the weakest part the whole process can be improved at the same time.

4.1.1 Business Process Management

Business Process Management (BPM) is a framework for managing and improving business processes that ties all elements of an organization together ensuring that the organization is truly process based. (van Rensburg, 1998:218) It is "a structured approach to analyze and continually improve fundamental activities such as manufacturing, marketing, communications and other major elements of a company's operation." (Zairi,

1997:64) The aim of Business Process Management is to organization in the way that it can bring value to the customers by fulfilling their needs and requirements as easily as possible.

There are as many BPM models as there are organizations applying the BPM. This is because the organizations decide themselves what are their business processes. Even though the processes are different, there are some similarities. Quite often the processes cover strategic, operational and supportive processes. (Armistead, 1996:49)

Even though the BPM models differ from each other organization by organization both Armistead (1996) and Pritchard and Armistead (1996) have identified some key factors that will improve likelihood for BPM adoption to be successful. Among the identified key factors are

Mapping the process   the only way to get a full understanding of the full process is to map it. The process map can be further divided into sub-processes until all tasks under the main process are described. The process mapping will help also to understand the process areas that bring value to the customers. (Armistead, 1996:50)

Process owner   in order for a process to be successful it has to have an owner has the end to end responsibility of the overall process and also how the process interfaces with other processes so there are no silos. (Armistead, 1996:50 and Pritchard and Armistead, 1996:17)

Process metrics   to understand how the effectively the process is operating. The metric selection is a key element as by choosing the right metrics the process is easily guided to the right direction. Wrongly set of metrics will not give the correct picture of the process and bad decisions can be made even though the decision making process would be well data-oriented. (Armistead, 1996:52)

Other elements in the successful Business Process Adoption are training, communication and continuously improving the processes.

BPM, like any framework is fairly easy to set up in an organization, but to keep it operating and starting to show the benefits takes a lot of effort. If an organization has been working for years in functional-based structures, changing to a process managed way of working does not happen overnight. (Armistead, 1996:48) It takes a lot of discipline from an organization. There are however tools that can help keeping the processes operating like they have been thought of. In the long run it is important that the process is tied to a quality assurance systems, like ISO 9001. Even though the quality assurance systems are put in place to ensure that the organizations follow the company operating models, they might not be enough to provide a culture based process management on their own. (Zairi, 1997:65) Pritchard and Armistead (1999:19) also suggest tying the PBM to a strategic change programs to gain the momentum for changing the processes while changing also other things in the organization.

4.1.2   Continuous Service Improvement According to ITIL

While Business Process Management can help to govern any process in an organization, there is a framework that is aimed for governing IT processes. ITIL – short for Information Technology Infrastructure Library is a collection of IT best practices. ITIL is a detailed framework describing many fundamental IT processes, including also Change and Release Management. It also brings a governance framework to IT that is focused on continually improving the IT services from both business and customer point of view. (Moeller 2013:87) ITIL is widely recognized by IT organizations worldwide, as the unified terminology of ITIL means that organizations even very far apart mean the same things with the same terms.

ITIL is a continuous life cycle of activities that is divided to five different sections as shown in Figure 8.
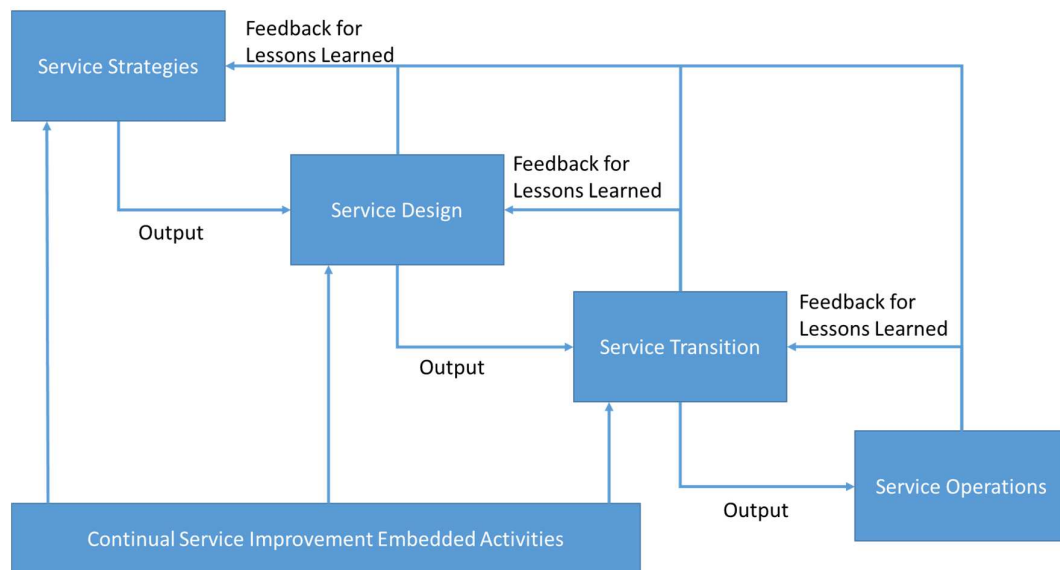
Figure 8: ITIL continuous feedback cycle (Moeller 2013:90)

The first part in the ITIL process is Service Strategies. Service Strategy is the starting place for the whole IT Service cycle. It describes the ITIL Service Management standards that give the direction to the three following processes: Service Design, Service Transition and Service Operation.

Service Design phase not only designs the IT services offered – including the functional specifications and other needed elements, but also the service management process and everything else that is needed to keep the service alive.

Service Transition phase ensures that any changes needed to the IT services are done in a controlled and consistent way. This part covers Change and Release management, but also other processes that are needed ensuring that a functioning service is moved to Service Operations phase.

Service Operations phase is the part that makes sure that the IT service is operational for the users. Should there be outages in the operations, Service Management elements designed in the Service Design phase ensure a speedy recovery for the IT service.

From all these processes there is a loop back to the previous step for improvements, but also to the Service Strategies for re-defining the IT service if needed. On top of this feedback loop there is also a fifth process called Continual Service Improvement. "ITIL

calls for any IT function to build a program of continual service improvements to review, analyse, and make recommendations on improvement opportunities in each of the ITIL service delivery life-cycle phases" (Moeller 2013:106)

4.1.3 Six Sigma

Six Sigma is a statistical methodology for process improvement formulated in 1986 by Bill Smith at Motorola. Six Sigma stands for six standard deviations from mean. (Desai 2010:2) Where BPM and ITIL aim to develop continuous improvement model for the process to keep it improving within time, Six Sigma process improvements are done as projects. A Six Sigma project is used for "pointing out total number of defects that has come across in an organizational performance". (Desai 2010:4) While the project contains a step for setting controls so the improved areas will continue to be part of the normal process execution and not returning to old ways of working, the project still has an end point. After the end point there is no loop back to the beginning like in the methodologies that aim for continuous improvement.

A Six Sigma process improvement project consist of five different phases as shown in Figure 9.
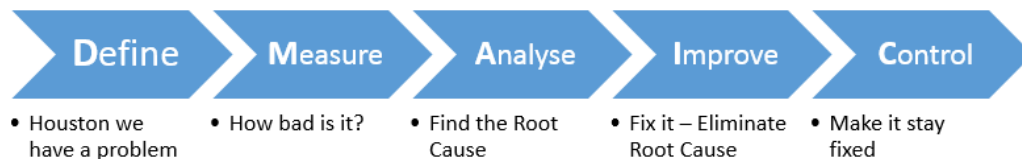
Figure 9: Five Phases of Six Sigma Project (IIL 2007-2009:1-16)

The project phases are known as DMAIC, coming from the first letter of each phase.

Define   Define phase is used to identify the problem at hand and also to define the scope for the project what should be included and what not. This is the part where also the customers and stakeholders get their voice heard for the issues. (IIL 2007-2009: 1-14; Desai 2010: 41)

Measure   Measure phase helps to understand the size of the problem. As the whole methodology is based on statistical analysis the data gathered is mostly quantitative. Qualitative data is also transformed into numbers. (IIL 2007-2009: 1-25, Desai 2010:49)

Analyse   Analyse phase gets to the root of the issue by analysing the process. Once the hypothesis of the root cause is done, it is proven to be correct or incorrect with statistical tools like Pareto charts, dot plots or in advanced cases even correlation and regression tests. (IIL 2007-2009: 1-37; Desai 2010:51)

Improve   Improve phase is where the root causes identified in previous step are fixed. (IIL 2007-2009: 1-48; Desai 2010:54)

Control   Control phase makes sure that the same issue will not happen again by implementing controls in the process that will make sure the process performance stays within the allowed limits. (IIL 2007-2009: 1-52; Desai 2010:57)

Even though Six Sigma projects are linear aiming to remove one root cause at a time, it can be used as part of continuous improvement processes.

All three frameworks described in this chapter highlight that the processes need controls in the process end to make sure that the processes are delivering what is expected. The information gathered at the end of the process should be somehow looped back to the beginning to make sure that the process can be adjusted when needed. What the process measures are depend on what is the expected output of the process. The next subsection describes a

4.2   Supply Chain Management

Where IT is governed with the framework ITIL, the framework for optimal logistics process is called Supply Chain Management (SCM). Although the logistic and IT belong to

different fields, the similarities of the processes encourage to reviewing the SCM frame-work for ideas that can be useful also within change and release process. IT change and release process can be seen as a delivery chain for IT requests. It starts from customer's needs, consist of multiple sub-processes and when the full process works as should, it ends with customer receiving what they needed. A manufacturing company's logistics process works with similar principle.

The Supply Chain Management puts "emphasis on integrating activities into key supply chain processes instead of individual functions." (Tang and Nurmaya Musa 2010 :27) The supply chain not only includes the logistics chain but it tries achieve co-operation by linking together all processes under supply chain including also customers, suppliers, and organization.

4.2.1   Pipeline Management and Lead Times

Order pipeline means the process that takes place from the moment the customer places an order to the moment that the order has been shipped to the customer. The time that takes for the order to go through the pipeline is called lead time. As the customers usually expect to receive their orders as soon as possible, the order lead time needs to be as short as possible. Looking from the supplier's perspective, the longer the logistics chain, the longer the lead time.

A way to reduce the lead time is to look at the supply chain as an entity and at the same time to aim to reduce the length of the pipeline and / or speed up the pipeline flow. (Christopher 2005:154) By examining the activities in the logistics chain the lead times can be reduced considerably by eliminating activities that do not bring value to the logistics chain. Value adding activities are the ones that benefit the customer. Other option for reducing the lead time is to identify if there are any bottlenecks in the delivery chain process. A bottleneck is an activity in the logistics chain that slows down the whole chain as the activities coming after the bottleneck activities are not able to perform as optimal as they would without the bottleneck activity. The bottlenecks can be reduced for example by increasing capacity where needed.

Global pipeline means the process that takes place from the moment the customer places an order to the moment that the order has been received by the customer. It not only counts the time for the logistics chain to manufacture the product but also the time

it takes to deliver it to the customer. The further the logistics start and end points are from each other, the bigger the variation can be on how long the overall lead time can be as shown in Table 3 below.

Table 3: End-to-end lead time variability (days) (Christopher 2005:217)

	From point of origin to port	Freight forwarding / consolidation	Arrive in country of destination	Customs clearance	Transit to point of use	Total elapsed time
Maximum	5	7	15	5	5	37
Average	4	3	14	2	4	32
Minimum	1	1	12	1	2	17

When there is a lot of variation in a global pipeline lead time it is really difficult for the customer to know when to expect to receive the order. This can cause issues especially when the customer needs the product as part of another supply chain.

The lead time variation can be reduced by creating visibility to the global pipeline process. One tool for improving the visibility is Supply Chain Event Management (SCEM). It monitors all the activities done in the pipeline. The data from the monitoring will help to take corrective actions and with that reduce the end-to-end lead time of the supply chain.

4.2.2   Measuring Is Knowing - KPIs for Supply Chain Management

To manage a process it is important to know the facts through data how the process is working. For companies it is essential know how the supply chain operates in order to be competitive in the market. "Uncertainty, growing competition, shorter cycle times, more demanding customers, and pressure to cut costs are just a few characteristics of the 21st century business environment. It has become critical to measure, track, and manage the performance of supply chain processes." (Stefanovic 2014:1)

When a customer places an order to a company, the expectation is that the company's supply chain delivers the order always on-time, in-full and hopefully also free of errors. An order that fulfills all those aspects is called a perfect order. Often the perfect order is measured as "on-time, in full" (OTIF), but sometimes the measurement can also include error-free. An error is error-free order is delivered with appropriate documentation and labels and without damage to the product or its packaging. (Christopher 2005:65) This

measure can be used for measuring the overall performance but it can also be segmented per smaller areas.

For calculating the service level for perfect orders, there must be a separate measurement for all aspects (on-time, in-full and error-free) of the calculation. When this is known the perfect order count is calculated by multiplying the different measures with each other:

% of Perfect order = % of on-time * % of in-full * % of error-free

Although the % of perfect order gives a good idea how the overall supply process works, there are also other KPIs that support the overall picture. Order cycle time tells how fast the order is delivered to the customer from the point of order, delivery reliability shows how often the order has been delivered on time. Claims procedure can help to understand what has gone wrong with the order – what was the cause of the error, how quickly it was resolved among others.

4.3   Project Communication

In project and any other kind of work activities communication is the part that is quite often neglected even though it is one of the corner stones for a successful outcome. "In the business world the ability to communicate effectively becomes more important because any type of organized activity demands communication." (Sharma 2010 :20) The project methodologies like PMBoK (Project Management Body of Knowledge) communication is given special attention but still communication in projects is often done in an informal manner. (Monteiro de Carvalho 2013 :37)

Project communication is the term that covers all areas of communication in a project. In the model shown in Figure 10 the communication is divided to external project communication that is aimed for the project stakeholders and others who are not directly linked to the project work and to internal project communication to take place within the project organization. (Ramsing 2009:346)
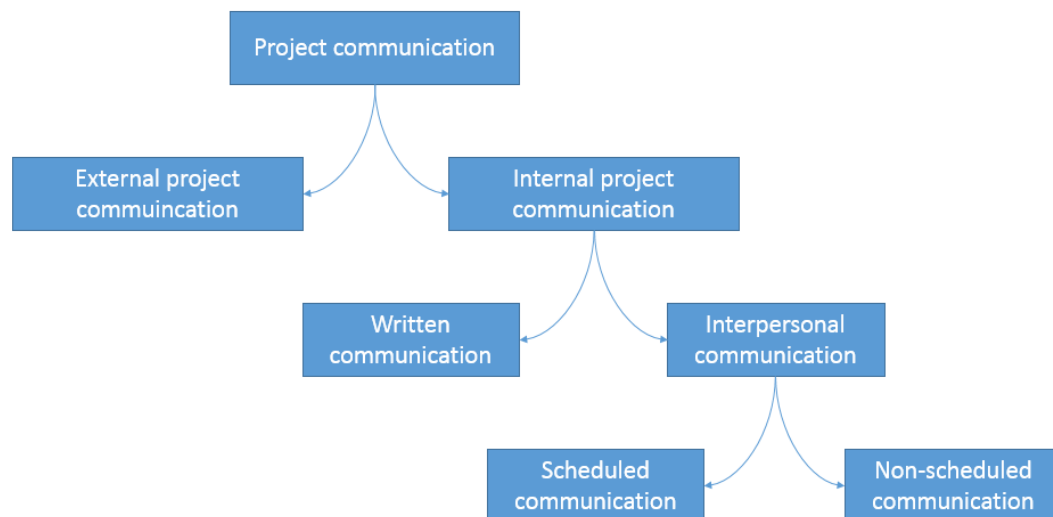
Figure 10: Interpersonal communication within project communication (Ramsing 2009:347)

The internal project communication can be further divided into written and interpersonal, i.e. personal interaction within the project team, this can consists of verbal communication, but also email is seen as a form of interpersonal communication. The interpersonal communication can be further divided into scheduled communication, like info calls or non-scheduled communication that takes place when needed. (Ramsing 2009: 347).

Communication is difficult if not nearly impossible if there are no tools to be used for the communication. The usage of different tools depends the type of project as well as on the distance of the communication what kind of tool to select. (Monteiro de Carvalho 2013:40; Ziek and Anderson 2015:791) The communication tools are instruments enabling different kinds of communications for projects. There are many different communication tools, including face-to-face, emails, video and phone conferences and knowledge management systems. Communication tools enable the projects to be successful. "The more tools used by project managers the more successful a project team will be." (Ziek and Anderson 2015:791) Thus it is important that each project chooses the tools best suitable for that specific project.

In a project organization PMO (Program Management Office) is the primary function for developing the project management methodology and monitoring that project managers are compliant with the methodology. Part of this methodology is also communication.

Even though PMO is giving guidelines about the communication, in the end it is the project manager who is responsible of the success or failure of the project communication. (Monteiro de Carvalho 2013:38) "When deadlines, expectations are not met, when customers are not satisfied, it is result of poor human communication – not because Excel or any other information technology (IT) system fails in calculating a given situation." (Ramsing 2009:346)

A project manager needs many different skills for running and completing the projects successfully. It is not enough to have the technical skills but also ability to lead the different activities from managing resources, keeping schedules and budgets and make sure that also the project is delivering what is expected. (Ramsing 2009:346) To be able to run all these activities without big issues good communication skills are essential.

In a project world the communication from project manager is directed to two different areas, towards the project team and the stakeholders. It is important that the communication happens within the project team members who are the project managers' key sources for getting the information about the status of the project. (Monteiro de Carvalho 2013:40) Apart from the status updates, it is also important to keep an open communication within the project so all the project team members know what the objective is that they are aiming for.

It is equally important that the project has the stakeholders identified and the project manager has an open communication channel to the key stakeholders keeping them up to date on the project status so the project steering is able to make right decisions based on correct information. "Explicitly involving stakeholders in project communication management can facilitate the management of different expectations and the mitigation of these expectations." (Monteiro de Carvalho 2013:39)

When IT personnel and the stakeholders and IT users communicate with each other it quite often happens that they do not speak the same language. Where the stakeholders use their business vocabulary the IT personnel often use the IT jargon. Monteiro de Carvalho 2013:42) For a successful project outcome it is important to form a common terminology and framework within the project organization.

Kurland and Pelled (2000:428) write that there are two types of communication models. A linear model that consist of a source, a message, a communication channel and a

receiver. This is passive communication where the source is active and the receiver is passive. The second communication model is a two-way process where the participants in the communication are simultaneously sending and receiving messages. For ensuring practical value in communication models there needs to be a balance between the two models. (Kurland and Pelled 2000:428)

Even with the linear, passive communication model it is important that there is some kind of possibility for the passive receiver to give feedback on the message they have received. "Feedback is, though the last element is the important one in communication process. As it has been explained, communication is an exchange. The exchange to be complete, the information must go back to the communicator." (Rayudu 2010 :207)

A difference between an IT Project and an IT change request is the size. Both projects and change requests aim for bringing something new or changing a feature in a business application. Whether the change is done as a project or via a change request is determined by the amount of resources (people, time and money) it takes for achieving what was requested. Just like for projects, communication is equally important for change request to ensure the stakeholder, i.e. requestor satisfaction.

4.4   Conceptual Framework of This Thesis

This chapter discussed the literature and best practice that can be used for eliminating key issues in Change and Release Management process. These different aspects are summarized in this sub-section by combining the knowledge from the previous sub-sections. The outcome is the conceptual framework presented in Figure 11.
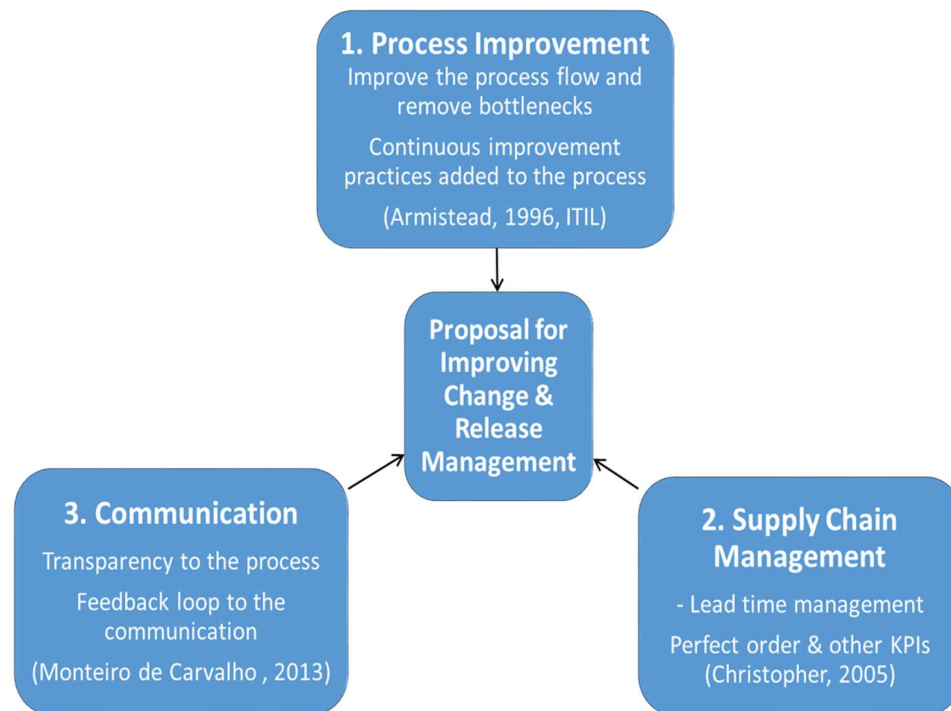
Figure 11: Conceptual framework for improving change and release management.

As Figure 11 shows the conceptual framework consists of the three different methods and best practices. First, for the process improvement best practices have been found in three separate frameworks that in their own way optimize how a process operates. Secondly, the Supply Chain Management shows how issues in logistics process, like long lead times or process flows can be improved. The processes are not so different from IT processes and the findings can be applied to improving the case company processes as well. Thirdly, ideas from communication materials can help to solve the issues related to communication and transparency with the change and release process.

In Section 5 the conceptual framework is utilized for eliminating the business problem of this thesis and build the proposal for the case company.

5 Building Proposal on Improved Change and Release Management Process

This section presents the proposal for the case company of an improved Change and Release Management process. First, this proposal shows new, less complex model for the process that will improve the process lead times. Secondly, this proposal introduces new KPIs to measure the process performance for improving the process quality. Finally, this section discusses the ways to tackle the issues related to the transparency and communication of the process. This section ties together the findings of the current state analysis and the conceptual framework for the building of the proposal using Data 2.

5.1 Overview of Proposal Building

The current state analysis identified the weaknesses in the current Change and Release process. Some of the weaknesses had been identified earlier and there are already improvement actions ongoing for those. The aim of this study is to improve the weaknesses in approval process, how a change request is assigned to a release and in the communication and transparency of the process. By eliminating these weaknesses the process quality and lead-times will improve.

The proposal aims to eliminate the weaknesses identified in Section 3 and it is built with the case organization experts in the fields discussed in Section 4. The case organization experts include a quality process expert for improving the process flows, a change and release manager for discussing the suggested KPIs for the improved process and a senior communications specialist for the communication part. Developing the proposal with the selected experts ensures that the good parts in the process are not removed by mistake and the weaknesses are eliminated with someone who is really familiar with the topics. The discussions with the experts have been informal, going through the Sections 3 and 4.

5.2 Improving the Process Flow

As identified in the CSA the change and release process flow is now as optimal as possible. The different weaknesses will be discussed in the subsections for this section. Table 4 shows an overview of how the weaknesses identified in current state analysis

are tied together with the conceptual framework and input from process experts to find a solution.

Table 4: Overview of Process Flow Improvement

	Current State Analysis / Data 1	Conceptual Framework	Stakeholder / Data 2
1.1	Having a Global Process Owner as first approver slows the process	Supply chain management aims for process flow improvements by removing any bottlenecks from the process	Changing the approval order in the process the process flow is improved
1.2	Having a Global Process Owner as first approver slows the process	Business Process Management highlights on having the right roles in place	The roles are in the right place but the responsibilities of the roles should be checked
2	It is unknown in which release the change is going to be deployed to production → emergency release process misused	Order pipeline management within supply chain management aims to reduce the lead times by removing variation in the process	By assigning each change to a specific release before the development work starts the users know when to expect the change to be deployed
3	*"Good in implementation, not in follow-up" - Interviewee 8* A systematic review for the change process is missing	ITIL and Six Sigma highlight the importance of data continuous improvement of a process based on data	Post implementation review (PIR) to be implemented to review what happened within the lifecycle of the change request

5.2.1 Approval Process Improvement

As identified in the current state analysis by multiple interviewees, one of the biggest bottlenecks in the change and release process flow is the approval of a change request. At worst there may be three or four approvals done before a normal change is deployed to production environment. Like described in the current state analysis, the approval process starts with the Global Process Owner (GPO) approving all the change requests, regardless if it is a process change or a change related to an IT application. There are no targets at the moment how fast the approval should be done so it is up to the GPO's own decision when the approval takes place.

One of the ways described in Supply Chain Management for reducing lead times in a process is to eliminate the bottlenecks in a process by e.g. increasing capacity. For eliminating the bottleneck in the approval process capacity increase is not really the solution, but the bottleneck can be eliminated by chancing the process flow. As the IT Solution owners are interested in all the IT changes, which are majority of the change requests and the GPOs are only interested in the process changes, the approval process should start from the Solution owners, who will then filter the process change requests to the GPOs as shown in Figure 12 in the next page.
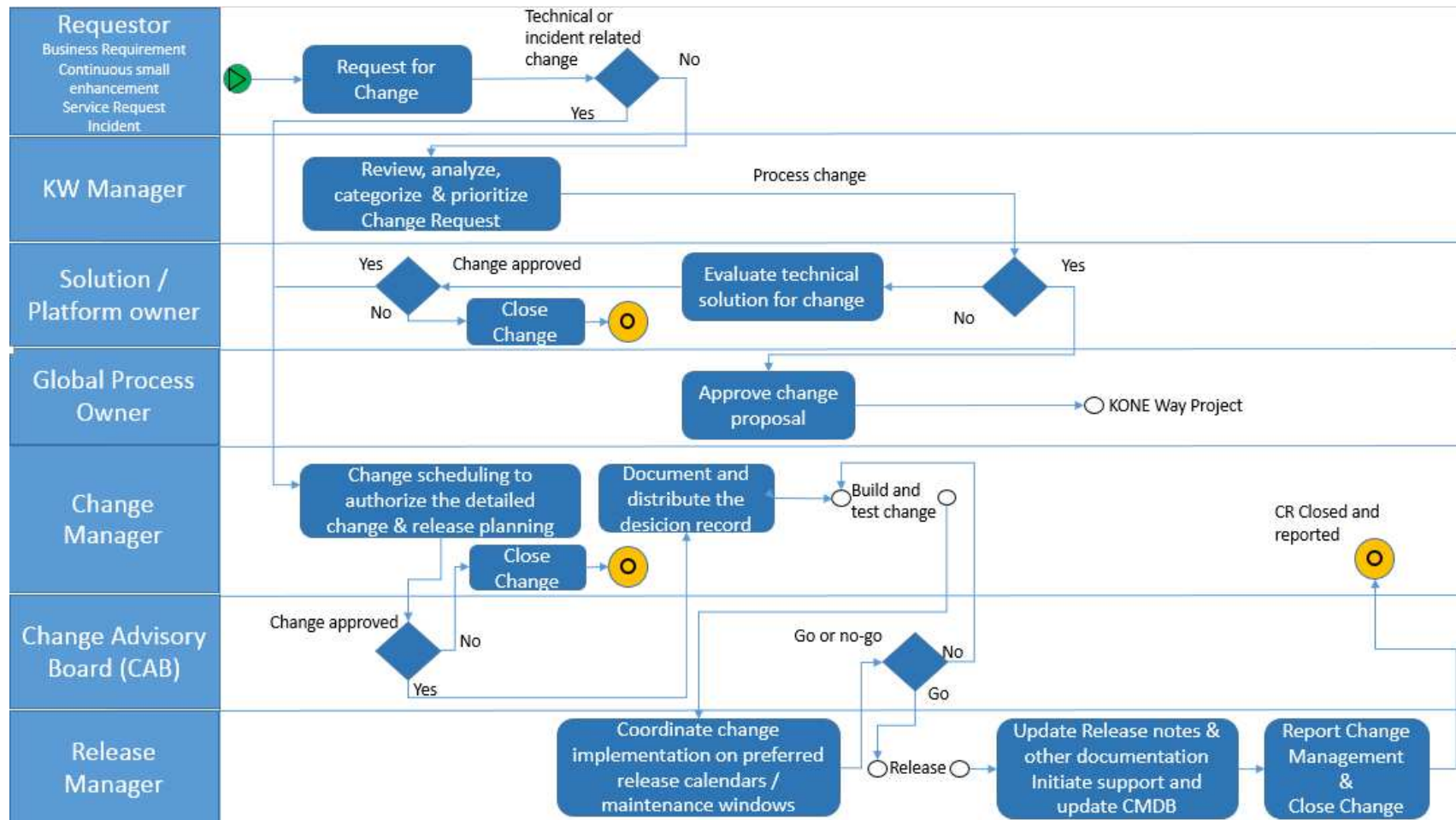
Figure 12: The revised approval process for normal changes

5.2.2 Release Assignment Improvement

Release assignment was mentioned in the CSA multiple times. The problem is not only that the requestors are not aware when the change is going to be deployed but also that the projects do not take the release schedules into account when planning for the project go-live. This may lead to misuse of the emergency change process as the request for deployment comes on very short notice for the project to be able to achieve the go-live dates. This could be avoided with better planning and knowing the release schedules. Supply Chain Management aims to improving the lead times by reducing variation from the process. In case of change and release process the variation can be removed by pre-assigning a change to a release already before the development work starts. Although this does not apply to 100% of the cases as there will always be changes that need deploying on a specific day for example for legal reasons, these are however exceptions.

5.2.3 Continuous Process Improvement

The different frameworks described in Section 4.1 indicate that at the end of the process there should be some kind of process control or a feedback loop back to the beginning of the process. This way the process can be further improved within time. Without this kind of loop the process continues to run as originally designed, even though it might not be optimal process.

One of the current state analysis interviews mentioned about re-CAB meeting practice, a lessons learned session after each release.

> *"A practice was instigated with the change team that after the CAB on following week we have a review meeting of all of the changes that were approved. We go through them to see if it was executed or wasn't it executed and if it wasn't executed as planned why it was not executed. They [the change team] will give us a run through on if there were any issues and what are the next steps."*
>
> *Interviewee 11*

This process is also known in ITIL as post implementation review (PIR). All the changes deployed in the release are discussed in the review meeting and if something has not gone by the book, corrective actions are taken. While that kind of meeting might not work as such for a major release with thousands of transports, for all the smaller release types this could be used as a best practice. After a major release there is usually a hyper care period for some weeks where the business can report issues identified after the release. While the hyper care meetings concentrate on fixing the application, it could also be used for root cause analysis what caused the issue and creating corrective actions for those.

5.3   Change and Release Process KPIs

To know if a process it is performing it needs to be measured. The KPIs not only guarantee the flow of process from day to day but can also be used for improving the process further. The different KPIs and why those are needed discussed in the subsections for this section. Table 5 shows an overview of how the weaknesses identified in current state analysis are tied together with the conceptual framework and input from process experts to find a solution.

Table 5: Overview of KPIs

	Current State Analysis / Data 1	Conceptual Framework	Stakeholder / Data 2
1	Currently there are not many KPIs measuring the change and release process	Business Process Management highlights the importance of having process metrics in place	Define a set of basic KPIs for setting a baseline for the measurements
2	A change takes too long to implement	Supply Chain Management introduces the KPI for lead time measurement for both the full process and the sections of the process	Define what are the steps where the lead times need to be measured on top of the full process
3	The process is not very stable	Supply Chain Management introduces	Define what are the areas within the change

		the KPI for perfect order to measure the overall performance of a process by measuring different process outputs – like lead time, order correctness or order fully delivered	and release management process that could be used for measuring the overall performance of the process

There are not many KPIs measuring the change and release process today. The current KPIs have concentrated on measuring the backlog of the change request – i.e. how many CR's there are waiting for release. Those requests can be in any status and the KPI does not take into account how long those have been in the queue or why. The lack of KPIs depends partly on the organization, there has not been any need for extensive measuring of the process due to other priorities. The current change management tool does not support the measuring by missing some of the key fields that would be needed for measuring most of process KPIs. There is a plan in the case organization to renew the current change management tool. The new tool will be part of a tool that has already been implemented for project management and service management as part of the operating model change program. The KPIs suggested in this sub-section should be considered when listing the requirements and developing the new tool.

5.3.1 Setting the Baseline

When discussing with the change and release manager about the KPIs it became evident that as the current process does not have many KPIs at the moment, it is important to start the measuring by setting the baseline for the process. The baseline can consist of the very simple measures like number of changes deployed (by change type), change acceptance rate (number of accepted vs. number of rejected change requests) or change success rate (percentage of changes implemented successfully according to PIR / all deployed changes.) Establishing the baseline for the process shows already if there are any big gaps in the process. When the baseline measures are showing that the process is stabile it is possible to start measuring the process more deeply to get an understanding of its overall performance.

5.3.2 Lead time

As stated in the conceptual framework, for a supply chain process it is essential know both the overall lead time of the supply chain as well as the lead times of each sub-process. This way it is possible to see if any of the sub-processes is not performing as well as expected. The overall lead time for the change and release process is measured from the change request creation date to the release date. The overall lead time consists of the time for approvals, development & testing and release as shown in Figure 13.
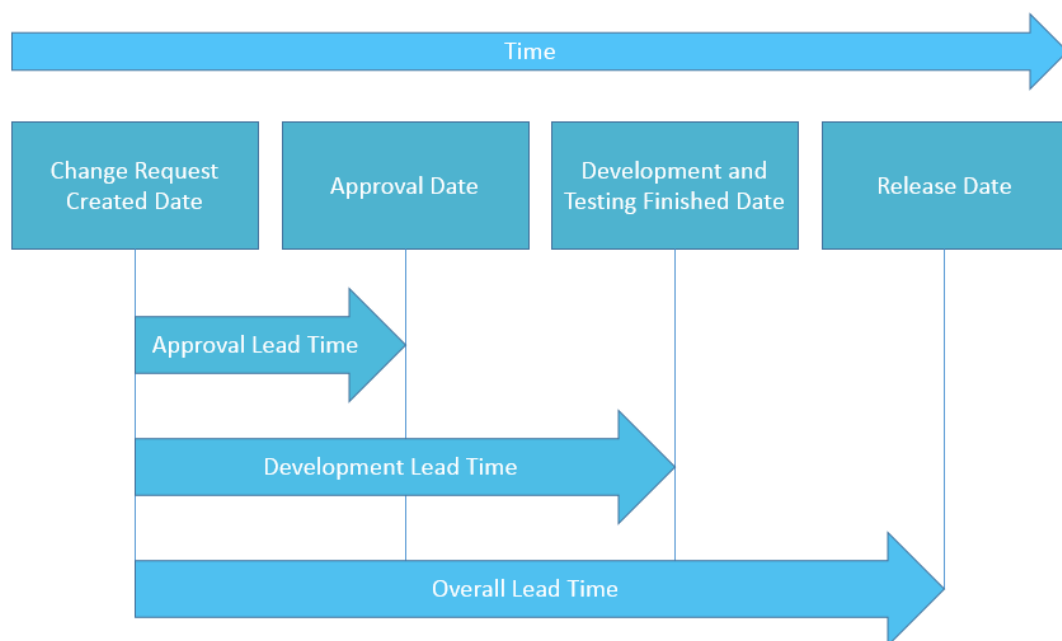
Figure 13: Lead time for change and release process

There should be a target for both the overall lead time as well as the lead times inside the process. The work done outside this study for improving the prioritization of the change requests has defined overall targets for the change requests with highest priority. According to this target any Priority 1 (P1) and Priority 2 (P2) requests should have the release day within six months from the submission of the change request.

5.3.3 Perfect Change Request

Supply chain management introduced in the conceptual framework identifies *perfect order* as one of the supply chain KPIs. It measures the overall performance of the supply chain by measuring different aspects of the process and then combining those into the overall performance. Similar logic can also be applied to measuring the overall performance of change and release process.

While the supply chain perfect order measure consist delivery on-time, in full and without errors, the perfect change request would combine the measures for on-time delivery, change deployed as part of a release and incident free after hyper care period.

*% of Perfect CR = % of on-time * % of part of release * % of incident-free*

The % of on-time measure for the perfect change requests should not be the full lead-time of the order but start the calculation from the point there is a common understanding from both parties on what the change is expected to deliver, in other words from the point the change has been approved.

The % of part of release is counted of change requests deployed within a planned release, not as emergency release. While there are always cases that need to be deployed on a specific day, this measure will also guide the planning for the needed in production date to be on a release day.

The % of incident free change requests is measured in the post implementation review. Most of the incidents related to the changes will appear within the few first days after the deployment, so those should already be known when running the post implementation review.

Regardless of what KPI, they should be measured regularly. For the getting an overall understanding of the performance of the change and release process a monthly measurement is sufficient. However, for keeping the process operational a monthly measurement is not enough. If the process performance stars moving to the wrong direction, getting the understanding of this only a month later is too late, a lot has happened within that time. Daily measurements may not show the big picture, but with weekly measurements it is clear to see the trend of the performance and still take needed actions in timely manner.

5.4   Improving the Communication for the Change and Release Management Process

Communication and transparency are the key for a change requestors to know what is going on with their requested change. By increasing the transparency also the customer satisfaction towards the process increases. The different improvements to the communication within the process are discussed later in this section. Table 6 shows an overview of how the weaknesses identified in current state analysis are tied together with the conceptual framework and input from process experts to find a solution.

Table 6: Overview of KPIs

	Current State Analysis / Data 1	**Conceptual Framework**	**Stakeholder / Data 2**
1	Business users are not aware of what already exists and therefore start defining the solution before creating the change request	Simultaneous communication between the project team and the project manager for exchanging the messages	Open a communication channel between the business users and the Solution owners to find out already exists or of there is a need to develop something to fulfill the business needs
2	No follow-up on the changes deployed	It is important that there is a possibility for a receiver of a communication to also give feedback to the one giving the communication	Create a way for the requestors to give feedback to the IT department on how the change was done

When a change request is created, the user is often left in the dark on what is happening with the change request. Is it proceeding and if not, why is that? Or maybe the change request was even rejected although there is a clear business need for it.

When someone creates a change request, there usually is a need for changing something already existing. Quite often before a CR is submitted there is already a lot of work

done on the business side to clarify what kind of solution is needed and how it should be designed. By the time it gets to the IT Solution Owner it may be rejected as it is not feasible to make or there is already some other way of doing the same thing. This may leave the requestor feeling unappreciated as the hard work put into creating the change request is not leading anywhere.

> *"The units don't have a channel to communicate with the Solution Owners outside the formalized change request process. Because they don't have someone to talk with about their problem to know if we already have something, what happens is that either they go to their connections but they may not get the right answer as they don't connect to the right person. Then what happens is that instead of giving their business needs they start to develop a concept of the solution they want to have."*
>
> *Interviewee 3*

In order for avoiding the change request rejection after submitting the CR there should be a forum for the Solution Owner and the business to discuss together about the needs in the application. It may lead to no need for CR's in the first place or at least to well scoped and defined change requests that are easier to make. Although this kind of communication would take place before the actual change request would be created, it is discussed here as it directly feeds into the Change and Release process.

In the current state analysis the lack of transparency for how the change request is proceeding was mentioned quite many times. There is currently no place where to follow the progress of the request as the change management tool used today does not allow it. When developing the new change management tool, it should include a portal for the requestors to go view the status of the change request and also in which release that change will be deployed to production. At the same time the change request tickets in the tool should be kept as up to date as possible so the latest information is available in the portal. Without the updated request information the portal will not create the needed transparency, but just more dissatisfaction among the users.

The IT department's communications team is working on to create a site where they are gathering the information about the changes that have an impact for the business in the

coming weeks. This site could also be used for announcing the releases and the contents of the releases.

> *"We have created an IT communications sharepoint, which includes an IT change calendar and a section called "Application news". In the calendar all IT employees can add information on the planned project go-lives and possible downtime in IT services. In addition, in the "Application news" section the IT solution / platform owners can add more detailed information on smaller changes e.g. updates to commonly used IT applications. This is not very widely used yet but it is one of the items we need to further develop."*
>
> *Communications specialist*

From the requestors point of view it is the easiest when there is one central location where that information can be found. Some change management tools also provide this kind of dashboard that gathers the information from releases scheduled in the tool. By using a tool that already has the information, double work for the reporting can be avoided. This is something to be investigated when the new change management tool will be planned. Before that the site for communication would offer the same information, only with manual input.

5.5   Initial Proposal for Improving the Change and Release Management Process

It was identified in the current state analysis that overall the change and release management process works in the case organization. However, the process is not optimal and causing dissatisfaction in the users requesting for changes. In order for improving the change and release process the case organization needs to make changes to the overall process. Conceptual framework helped to find fixes to all three identified weaknesses. The different topics studied for forming the conceptual framework did not only have suggestions for solving one of the weaknesses, but each studied topic seemed to support improving all three weaknesses as shown in Table 7.

Table 7: Proposal for change and release process improvement

Conceptual Framework / Weakness	Process flow / Approval Process	Incorrect release assignment	Transparency / Communication
Process improvement	- Remove the bottle neck - Change approval process so the solution owner approves the big mass - Post implementation review (PIR) for evaluating the overall process cycle and applying corrective actions when needed	- Use the post implementation review (PIR) to understand why the change was deployed outside the release schedule - Assign the change requests to a specific release already before the development starts	- Add a communication loop back to the beginning of the process

Supply Chain Management	- Add KPIs for measuring the process performance
	   - Baseline
	   - Lead time
	   - Perfect change request
		- Part of perfect change request measurements to support the correct release assignment. (% of changes within release	- Bring transparency to the process by sending the change status updates via automated emails from the change management tool

Communication	- Discussion with Solution owner prior to change request to discuss the feasibility of the needed change and to find out if there are alternative work arounds	- Discussion with Solution owner prior to change request creation to determine when the change is needed in production	- Utilize better the SharePoint site where all different releases can be communicated. Future development – have this available in the change management tool

In Section 6 the proposal drafted in this section will be validated with the stakeholders.

6   Validation of the Proposal

This section validates the proposal developed in Section 5. Validation has been done together with the key stakeholders and the initial proposal has been open for all users working with change and release management via internal social media.

6.1   Overview of Validation Phase

The aim of the validation step is to ensure that he proposal suggested in Section 5 is strong enough to improve the change and release management process in the case organization.

The validation was done in two steps. First by having a meeting together with the head of PMO and case organization's new change and release manager to discuss the initial proposal. After this discussion the proposal was added to Yammer, the internal social media used in the case company, to a group for discussing how to improve the change and release process in general.

These two forums were selected as the validation channels as the head of PMO and the Change and release manager have the best understanding of how the process should be running in the case organization. The social media was selected to get as large attention to the topic as possible.

6.2   Developments to Proposal based on Findings of Data Collection 3

The Data 3 was gathered with interview of the head of PMO and Change and Release manager who will be the ones implementing the improvements suggested in this study for the part that are feasible and also developing the new change management tool for the case organization. Further information was gathered through the social media Yammer with users interested in the improvement of change and release process.

6.2.1 Feedback from the Key Stakeholders

This subsection discusses the validation for the proposal presented in Section 5. Firstly the validated suggestion for the process flow improvement, secondly the stakeholder's comments on the newly formed KPIs and thirdly the improvements suggested for the communication and transparency for the change and release process.

The proposal validation with the stakeholders was quite easy, the suggested improvements were accepted as such for many of the suggestions. For part of them, some minor changes were asked, but overall the stakeholders have been happy with the proposal.

The improved process flow map and the plan for changing the approval process and adding the best practice of post implement review (PIR) were accepted without any changes. The validation discussion was open for all the employees in the company through the social media and few people outside the case organization also participated in the discussion. PIR received also support from the case company's global quality organization.

> *"I like the proposal for PIR as it is nicely linked with the knowledge management requirement in ISO-9001:2015 and represents a possibility to collect lessons learned after implementation. "*
>
> *Quality Manager in Yammer*

The proposal for the new KPIs was well-received as currently there have not been so many KPIs for measuring the performance of the change and release process. What was discussed with the stakeholders was that the KPI implementation needs to start from the baseline measurements. Also the lead time and the perfect CR measurements were discussed more in detail to get an understanding when these measurements could start and what is going to be measured. What needs to be still defined are the targets to the measurements that however will be done once the baselines are defined and there is data based evidence on the current performance of the process.

One of the weaknesses in the process to be improved with the follow-up with the new KPIs is the unclear release assignment. While it is important to make sure that the releases are assigned to a release, also the view was accepted that in 100% of the cases it is not possible to have a change assigned to a release as there may need to be some cases that need to be deployed on specific days due to some requirements coming from the business.

The most changes to the original proposal came to the proposal for communication and transparency. The initial proposal suggested to bring more transparency to the process by sending automated emails to the requester from the change management tool for status updates. There was an alternative proposal to create a user portal where the users can go and see the status of the change request. This is to prevent spamming from the tool as the users may not want to get the emails, but to go and see the status on their own convenience.

The other idea for improving the communication and at the same the process flow is to add a customer satisfaction survey after each change request is closed. There is already a similar survey in place for incident management in the tool that will be the platform for the new change management tool as well. When an incident – or in the future a change request is closed, there would be an automated email sent to the requestor for asking for evaluation how successfully change was implemented with possibility to add open comments to the survey. This kind of survey would let the requestor to have a say on the process. This would then also give the needed feedback for continuously improving the change and release process.

6.3   Final Proposal

The final proposal for the improved change and release process is based on the initial proposal that has been modified based on the comments from the stakeholders. It presents minor adjustments to most of the proposed improvements from Section 5 but at the same time adds one completely new thing – the customer satisfaction survey. The validated proposal can be seen in the Table 8 on next page.

Table 8: Validated proposal for change and release process improvement

Conceptual Framework / Weakness	Process flow / Approval Process	Incorrect release assignment	Transparency / Communication
Process improvement	- Remove the bottle neck - Change approval process so the solution owner approves the big mass - Post implementation review (PIR) to be put in place for evaluating the overall process cycle and applying corrective actions when needed	- Use the post implementation review (PIR) to understand why the change was deployed outside the release schedule - Assign the change requests to a specific release already before the development starts	- Start a customer satisfaction survey to get an understanding from the requestor how the change request was delivered. It also adds the needed feedback loop to the beginning of the process for corrective actionsl

Supply Chain Management	- Add KPIs for measuring the process performance
	  - Baseline
	  - Lead time
	  - Perfect change request
		- Perfect change request KPI to support the correct release assignment. (% of changes within release calculation)	- Bring transparency to the process by creating a portal where the requestor is able to and check the status of the change request.

Communication	- Discussion with Solution owner prior to change request to discuss the feasibility of the needed change and to find out if there are alternative work arounds	- Discussion with Solution owner prior to change request creation to determine when the change is needed in production	- Utilize better the change and release site in SharePoint where all different releases can be communicated. Future development – have this available in the change management tool

The next, final section concludes the study with the summary and evaluation criteria.

7   Conclusions

This final section of the study discusses the objective and outcome of the study. It gives suggestions to consider when implementing the changes suggested in this study. This section also goes shows the evaluation criteria for this study and how well those have been met.

7.1   Executive Summary

The objective of this study is to improve the change and release management process within an IT department of a large manufacturing company. The current change and release process used in the case organization works, but not as optimal as it could. Lack of transparency to the releases, proper resourcing or issues with prioritization cause dissatisfaction in the change requestors as they do not know when the change they requested will be deployed to production, if deployed at all.

The research method for this study is a case study. The study started with current state analysis to identify the strengths and weaknesses of the change and release process in the case organization. The strength of the process is that even though not optimal, the process still works, there is no need to start building the process from start. Altogether five weaknesses were identified: problem with allocating resources for the change requests, prioritization of the requests, non-optimal process flow, especially with the approval process, unclear release assignment for the change requests and lack of transparency and communication throughout the process. Out of these five there are already activities ongoing for resourcing and prioritization so this study concentrated on finding answers from literature and best practices on how to improve the process flow, release assignment and communication.

The outcome of literature review is a conceptual framework that introduced three different frameworks for improving the process weaknesses. Firstly, based on ITIL, Business Process Management and Six Sigma a process flow improvement framework was formed. Secondly, studying the supply chain management introduced a framework for measuring the process performance. Thirdly, by studying IT project communication a model for communication and transparency was formed.

The current state analysis and the conceptual framework together with working with the experts in the case organization helped to form an initial proposal for the improved change and release process. The suggested improvements are around the three weaknesses from the CSA. Firstly for improving the process flow bottlenecks will be removed from the process by removing bottlenecks, like optimizing the approval phase. Secondly the release assignment can be improved by adding it to a specific release already by time the development starts. Thirdly the communication and transparency will improve when the business users get a channel to discuss with the solution owners about their needs already prior to creating a change request. Communication will also be improved at the end of the process by letting the users give feedback on the change when it has been deployed to production. All this will followed up by adding KPIs to measure different parts of the process to get an overview of the process performance and to enable continuous improvements. This proposal was then validated with the key stakeholders and in the company's internal social media within the change management improvement discussion group. The suggestions from the stakeholders and from discussion were taken into account and the final proposal for improved change and release process was formed.

This study suggests different kinds of improvements to the change and release management process. By implementing these suggestions the business benefits will be realized in different areas. By streamlining the process flow and improving the approval process the lead times for change deployment will be decreased. The shorter lead times combined with adding more bringing transparency to the process by improving the communication will increase the user satisfaction with the process. This can be realized by adding an internal customer satisfaction survey to the change and release process. Whenever a change has been deployed to the production environment and the change request has been closed there would be a short survey sent to the original requestor to get their feedback on how the change was deployed.

Adding the possibility for users to give feedback at the end of the change deployment and adding the post implementation review (PIR) for validating how the change deployment took place from the IT team's perspective will give proper data for getting an understanding on how the process is running and enabling the continuous improvement to the process.

New KPIs will guarantee that the process will operate as optimal and stable as possible. By making sure that the KPIs are measured as frequently as needed it will help to steer the process to the right direction – for example to make sure that the changes are assigned to a release and not wrongly deployed through the emergency release process.

With the process continuously improved based on user feedback and having the process performance followed with the KPIs will benefit the business by ensuring that the process is working as stable and user friendly as possible.

7.2   Next Steps and Recommendations toward Implementation of the Proposal

The implementation of the proposal for improving the change and release management process is too big to be implemented within the scope of this study. However, as the process needs optimizing it is important that there are actions for implementing the proposal, if not fully at least partly. Some parts of the proposal, like post implementation review or baseline KPIs, are ready to be implemented immediately, but some need a change of tool before those can be utilized and need to be embedded in the project for new change management tool.

During the study there was the realization that although the case organization is following the ITIL processes it is not fully ITIL compliant. There could be a further study done for finding out if there are any gaps in the current operating model that would benefit from ITIL.

7.3   Thesis Evaluation

This section evaluates how well the outcome of the study is aligned with the problem stated in the beginning of the study and the objective to improve it. It also discusses how reliable and valid this study is.

For any research to be relevant and useful, the researcher must be able to show that the research has a logic, and be able to prove the quality of research outcomes. In other words, it is important for the research outcomes to be generalizable, reliable and valid. This will ensure the readers that the research is not just the interpretation of one writer. (Quinton et Smallbone 2006). To ensure quality of research, various criteria can be suggested. The most popular are validity and reliability, but often other criteria are also

stressed, such as, for example, rigor, relevance, logic, etc. This study focuses on four criteria when taking steps to ensure quality of its research process, tool and outcomes.

Logic is a discipline that examines human reasoning to deduce valid arguments from invalid arguments.

In this study, *logic* is shown by showing the findings, solutions and interpretations in a way that they are easily understood. Ensuring logic starts at the planning stage, since every research starts with a clear, logical plan – a research design. Also it is important to ground all the choices done in the research with proper arguments.

Relevance means that the knowledge gathered from e.g. interviews during data collection is about the same topic as the study. Relevance is also guaranteed by selecting the data sources carefully.

Relevance of research is "judged by an assessment of the importance of the topic within its field and what contribution it makes to the literature." (Quinton and Smallbone 2006:136). This means that the sources used for Data collection are about the same topic and the interviews have been conducted with people with right knowledge. In order for limiting the bias the interviewees for this case have been selected from different areas including employees from both business side and IT side as well as from management side and the employees who do the work related to change and release management.

Reliability of the research shows how carefully and rigorously the research has been carried out and documented. Typically, research can be considered reliable if some other researcher would be able to come to same conclusions by using the same data. (Blaxter et all 2010) For quantitative (numerical) data the reliability of the data can be ensured by demonstrating consistency of the results as well as the robustness of the measurement tool. Proving reliability of qualitative data can be slightly less straightforward as compared with quantitative data as there are no tests to show the reliability of data. Therefore reliability of qualitative data can be strengthened by using, for example, multiple data sources, using different tools for collecting data or collecting the data at different points. (Quinton and Smallbone 2006)

The method of using different data collection tools to answer the same question is called triangulation. Triangulation may help to reinforce the findings from the data by arriving to

the same answer from multiple directions. Even if the different data sources do not show the same answer, it does not mean that any of the data collected is wrong. It would mean that that the research topic is more complicated than originally expected. This does not necessarily mean that the adequacy of the research results are questionable, but the difference must be explained. (Gillham 2010)

For this research the reliability is ensured by using triangulation and multiple data sources. The data collected consist of interviews, survey results, and discussion in social media. Interviews were selected as the main data source as there is a lot of silent information about the research topic within the company. To support that the survey results were analyzed to further strengthen the understanding gained with interviews. For the same reason the discussion of the social media was followed. On top of these validity is ensured by having the full thesis reviewed at the end by process owner and peers.

Validity means that the thinking done for the study is transparent and that the approach to the work is rigor in a way that it is clear to anyone who is assessing it. (Quinton & Smallbone 2006). Not only is it important to ensure validity of the tools, but also that enough data is used for analyzing the case and that different perspectives to the question have been considered. Validity of the research can also be proven by showing enough evidence throughout the research to proof the case.

In this study the validity is ensured by interviewing enough people to make sure that there is no more new variables found during the interviews. The interviewees have also been chosen from both IT and business employees to make sure that the case is studied from all possible angles. The same principles are also followed in the further sections of the study. The validity of the conceptual framework is ensured by using enough valid sources from literature. The literature sources in this study include well recognized frameworks like Business Process Management, ITIL and Six Sigma. Proposal for the solution built in this study is validated by having enough people reading the proposal to rule out new variables the same way as during the interviews in current state analysis. In the end the validity was ensured with collecting reviews by process owner and peers.

7.4   Closing Words

Finally, although this study has aimed to improve the change and release management process within the case organization, it is not possible to start implementing the suggestions within this study. The need for the process improvements still exists and there is a newly appointed Change and release manager in the case organization who will take the improvements forward to the next level, which the author of this study warmly greets and looks forward on seeing the suggestions of this study come live.

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Interview questions for Data 1 collection

Question 1	What is your role?
	How is it related to change management in KONE IT (KONE WAY changes / change management in general)
	How long have you been working with the change process?)
Question 2	Can you describe the current change process with few words? The process flow for example
Question 3	What is working in the current change process?
Question 4	What is not working in the current change process?
Question 5	Have there been any improvements in the process in the past years? E.g. Comparing to the work orders?
Question 6	Change & release management related to projects - How does the process work in general
	How are the projects taking the release schedule into account?
Question 7	What are the roles of business and IT in the change & release process?
	Are those roles working? Should they be changed? How?
Question 8	Approval process - what would be the best way for approving the changes?
	What kind of changes would be needed in the approval process so the approval could be done in IT (Solution owner, design owner, etc.)? (Knowledge, responsibility, time management?)
	What is preventing it today?
Question 9	How is the release management working today in your area?
	Release management - who decides what CRs will be in which release?
Question 10	What challenges or risks do you see in changing the change / release process?

	What would be the worst case scenario?
	What does it take to have a successful change process?
	How can you measeure that the change & release process is successful?
Question 11	Any process change will cause some change resistance. What would be the best way to tackle the change resitance of changing the change and release process?
Question 12	Anything else you would like to mention about the change process?

Change and release related questions and results in the IT Survey for Data 1 collection

Service in KONE IT (excl. GSD) - How satisfied have you been with the following interactions?