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Improving the Resourcing Process in an ICT Service Business

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This Master's Degree Programme has been a plan for the future in my mind for a long time already. When I got the acceptance letter I was really excited. This has been a time of growth and excitement where the lectures have been eye-opening, interesting and enlightening. The finale of the studies, this Thesis, now ready and in covers, was not only a respectable task to produce, but also a good challenge to develop the ways of work and also to network in a completely new way at the workplace.

I would like to thank my boss for his support in making this possible for me and all the colleagues who participated in interviews, workshops and knowledge sharing. The supportive and open environment that we have is something to aspire for and to preserve.

I would also like to thank my instructor Dr. James Collins; his advice helped me to get this to the finish line and not be lost in the maelstrom of material. He was there when help was needed, both in person, as well as through various online channels. I also wish to thank Dr. Juha Haimala for his advice and tips on the literature to get to the golden nuggets, and my process instructors Zinaida Grabovskaia and Sonja Holappa for their advice to get this text in thesis frames.

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| <p>This thesis focuses on human resource allocation and responsibilities in the case company resourcing process. It is important that scarce human resources are used and allocated efficiently in a multi-project environment. There is also need to monitor, at any given time, the use of allocated resources and their utilization. Over time, these accurate allocation snapshots become a learning tool allowing rational and efficient allotment of human resources responding to new resource requests. Optimized human resource management is the key to the success in any business and failure in that field has the potential to ripple through many, if not most, of other business processes of a company.</p> <p>Case study was used as a research approach in this study. Initially, the business challenge was identified together with the case company and based on that, the current state analysis was done using interviews, online survey and company data sources. Then existing literature on business process management and multi-project management was used to create the conceptual framework of this thesis. Based on the literature and current state analysis, the initial proposal was drafted. Validation of the proposal was done by evaluation and feedback from the key stakeholders to create the final version and ensure the relevance of the proposal.</p> <p>This thesis revealed the need to realign responsibilities regarding allocation handling in the resourcing process. Current practices and responsibilities warped the whole resourcing process denying the management of the case company and people at different levels of the process accurate information and therefore full and competent control of it. The proposal aims to fix this and realign the responsibilities according to best practice from the literature. The case company has decided to pilot this proposal and, based on the piloting feedback, implement it.</p> | |
| | Business Process Management, Multi-Project Management, Human Resourcing, Resource Allocation, Balanced Scorecard |

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Acronyms

| | |
|--------|--|
| BPM | Business Process Management |
| BSC | Balanced Scorecard |
| CC | Critical Chain |
| CCPM | Critical Chain Project Management |
| ConPIP | Constant Number of Projects in Process |
| CSA | Current State Analysis |
| GDC | Global Delivery Centers |
| HR | Human Resources |
| ICT | Information and Communication Technology |
| ITST | IT Services Transformation |
| KPI | Key Performance Indicator |
| LCL | Lower Control Limit |
| OGC | Office of Government Commerce |
| PMO | Project Management Office |
| RFI | Request for Information |
| RFP | Request for Proposal |
| SPC | Statistical Process Control |
| TOC | Theory of Constraints |
| UCL | Upper Control Limit |
| WP | Work Package |

1 Introduction

Resourcing is important for companies to divide work between employees in a way that the amount of work, time and skills meet at an optimal level. For this reason, it is imperative for businesses that the process of dividing work is in a good shape and utilized throughout a company in the same way.

“Allocating the right human resources to a project is vital. The more projects that are involved and the more specific knowledge that is needed in every project, the more important, but also the more difficult, is the allocation process.” (Hendriks et al. 1999)

However, in practice, the resourcing process may stumble across many various obstacles. One of the frequent reasons is, for example, that the work is requested urgently and it gets accepted without using the proper resourcing process. There may be many other reasons for not following the resourcing process as well. Also, the current trend of offshoring work is bringing new challenges to the resourcing and dividing work. Hence the resourcing process requires reviewing and improving to meet the demand of the current situation.

1.1 Business Context

The case company of this thesis is a global Information and Communication Technology (ICT) company, offering a full range of technology products, solutions, and services. It has over 150,000 employees that support the customers of the company in more than 100 countries. In Finland, there are local competitors and also a foreign competition that is entering the market.

The case company is providing services to mid and large sized companies. The bigger customers are the main focus. The company is providing a full range of services to customers in varying mixes of the service portfolio. There are different customer types. There are customers who have outsourced all of their ICT services to the company. Some have many providers who deliver parts of the ICT mix. In addition, some customers

still retain some parts of their ICT services within their own organization. Figure 1 illustrates a few different cases of the possible mixes the case company customers might have.

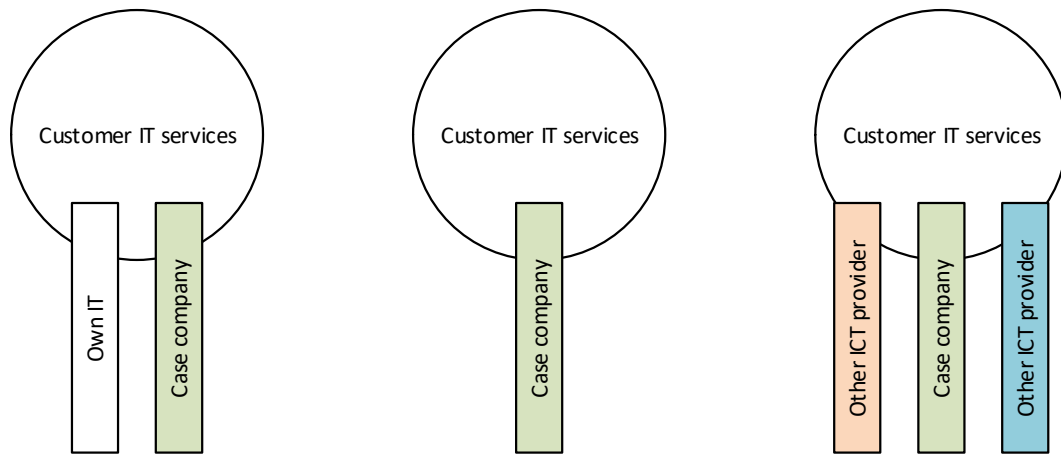


Figure 1. Service Mix.

As seen from Figure 1, the project work coming from various sources makes a big part of the company business portfolio. A substantial amount of revenue is generated through project related activities the company is delivering to its customers. All new customers need transition or transformation projects where the service is transitioned to the case company services and the current way of IT is transformed during the project, e.g. a new email server version is taken in use. Moreover, the existing customers are constantly doing development projects and change management since the ICT is rapidly changing. Figure 2 below shows an example of a mix of project work that can be allocated to one employee.

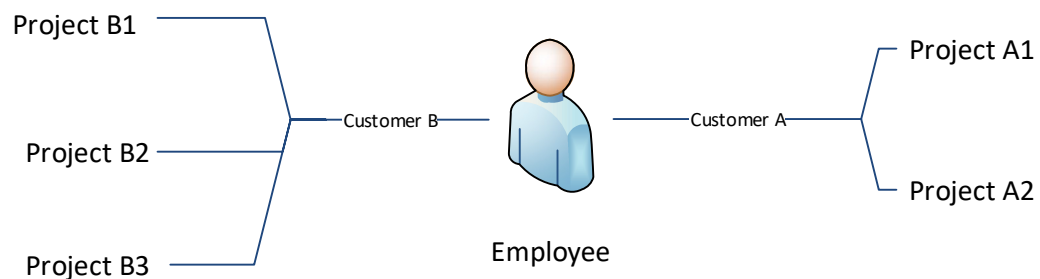


Figure 2. Example of allocated project mix.

Figure 2 illustrates one possible allocation mix, containing two customers where an employee is involved in two projects for customer A and three for customer B. The case company employees are also servicing multiple customers at the same time. This creates the need to plan and allocate employees so that the schedules and resources available meet.

1.2 Business Challenge, Objective, and Outcome

The business challenge in this study is that the current strategic resourcing process is not used in a systematic way and work tasks get requested and accepted without using the official process. Additionally, the current work requests and allocations do not correspond with the reported hours.

This creates inefficacy when deciding allocations and uneven distribution of workloads. The personally accepted work does not show on forecasts that are built according to allocations done from the official process. These reports are indicating how much time is already reserved from a given employee. Also, there is a problem that depending on how hourly reporting data is extracted from the systems the non-allocated hours might get lost. If these faulty records are used in decision making it will lead to bad decisions and, as a worst case scenario might have catastrophic effects.

Accordingly, the objective of the thesis is *to improve the existing process of strategic resourcing to enable the accurate and tracked allocations of HR within the resourcing process at the case unit.*

As a result, the outcome of the thesis is an improved process for strategic resourcing that enables an accurate and efficient way of resourcing HR in the unit that can be measured and tracked down.

1.3 Thesis Outline

The scope of this thesis is limited to the country organization in Finland that is part of a global corporation. Within that country, the thesis deals with the resourcing process for the defined unit that is, however, handling allocations of more than 200 employees addressing the requests from all units in the country organization.

The Thesis is conducted by finding the least effective ways of requesting and allocating HR in the unit at the moment and improving these ways to strongly relate the requests and allocations to the ways of everyday work. This thesis is conducted as a qualitative research using case study methods.

This Thesis is written in 7 sections. Section 1 in the Introduction. It is followed by the design of the thesis in Section 2. In Section 3, the Current State Analysis (CSA) is carried out according to the design, which is followed by a literature review in Section 4 to build a Conceptual Framework for the proposal. In Section 5, the proposal is made using the data from the CSA and Conceptual Framework. Finally, in Section 6, the proposal is then validated in the case company by stakeholders to get the final comments and finalize the proposal.

2 Method and Material

This section presents the research approach, research design, data collection and analysis of this study. This will give an understanding of how the research was conducted and designed to gain a reliable, fact-based proposal to the business challenge.

2.1 Research Approach

In this study, the case study approach is utilized. A qualitative case study approaches phenomena in an exploratory way, in the context of the case, using a variety of different data sources. Using this method ensures that the phenomenon is examined from many angles to gain a deep understanding of it (Baxter and Jack 2008). Yin (2004) is arguing that a case study method is a valid option when a question of the case study is formulated as “how”, “what”, or “why” something happened.

There are two main strategies in doing the case study research, namely qualitative and quantitative. Both have strengths and weaknesses. Quantitative strategy produces reliable outcomes when utilized within a larger population. The qualitative strategy has strengths to dig deeper and generate highly detailed and valid process data that usually keeps the study participants' views and perspectives intact. The qualitative strategy also gives the context for behaviors and research results. (Steckler et al. 1992)

When the researcher has access to previous knowledge, for example, company documentation, previous research, personal or professional experience or existing theories of case specific proposal, Baxter and Jack (2008) state that this existing previous knowledge can be used as a starting point for the case study. It gives guidance for the researcher when setting the scope for the research as well as it will help the research to be more complete.

Interviews make a flexible qualitative research tool since they can be used at any stage of the research. They give detailed information of the phenomenon studied. Interviews among other research methods are open to biases, the most critical of them is to achieve reliable and valid results. Quantification and objectification are good ways to lessen the effect of this and highlight the importance of keeping an objective stance throughout the research process. (Brewerton et al. 2001)

In addition to interviews, surveys and questionnaires measure potentially large samples with effective resources and cost usage. However, there is a need to consider multiple influences when designing the survey. The quality of the data is highly dependent on the wording and layout. (Brewerton et al. 2001)

The research approach in this thesis is a mainly qualitative case study but has some elements of numerical data also used. In this thesis, the goal is to address the question “what” asking what the resourcing process should be, after understanding “how” the resourcing process is working at the moment. Hence the case study approach is selected since it has strengths in its ability to analyze the case in-depth in a real-life situation. This way the process is examined through many lenses and deeper understanding is gained to make improvement suggestions.

2.2 Research Design

This thesis is carried out by conducting qualitative research using a single case study approach. The research design is built in five steps and illustrates in Figure 3 below. The research design shows a flow diagram where the data collection stages are presented on the left side and the outcome of each step on the right side of the figure.

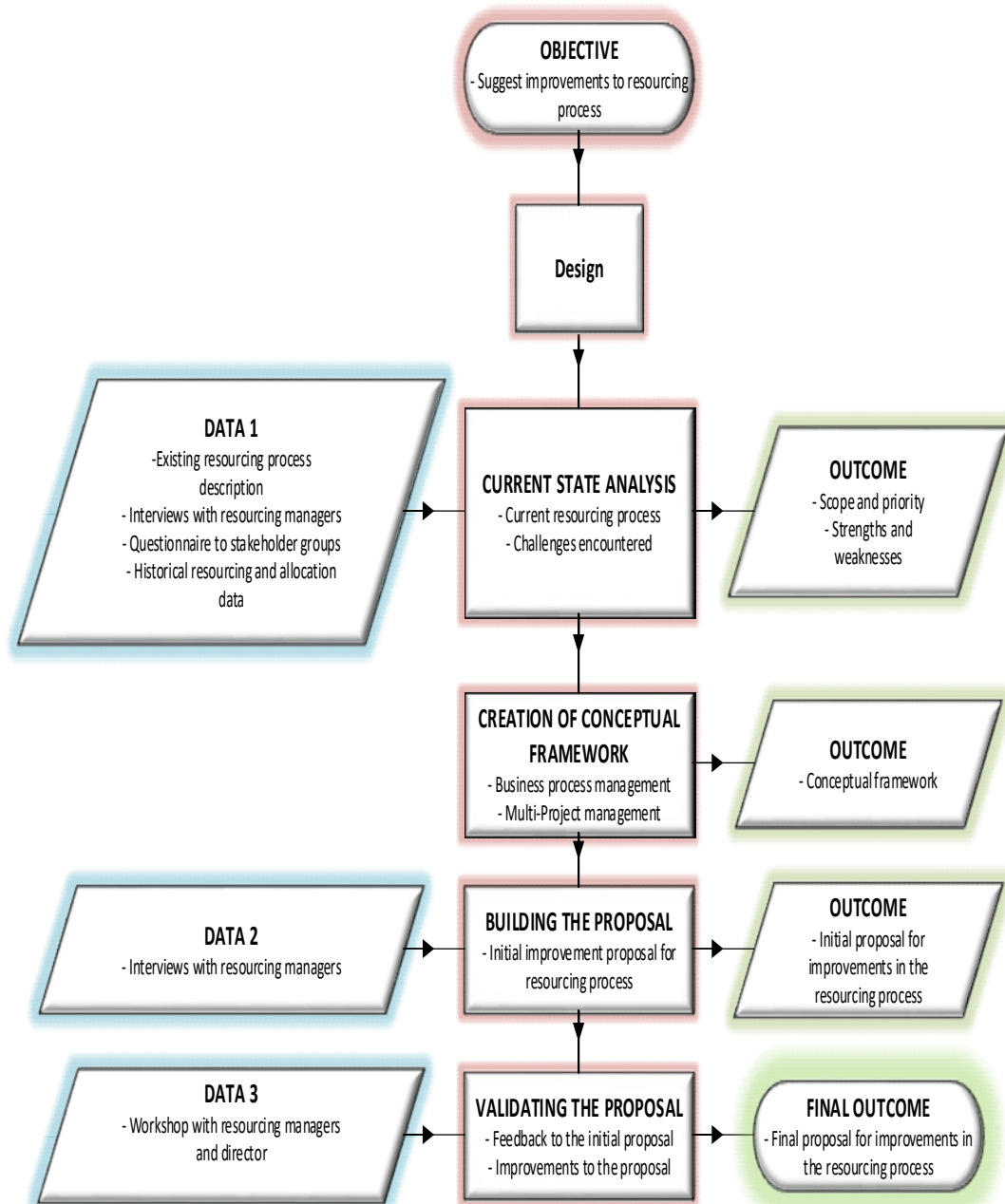


Figure 3. Research design.

Figure 3 illustrates the design of the study. It starts with setting the Objective, Designing the study, conducting the current state analysis, existing knowledge, building the proposal, validating the proposal and ending in final outcome and conclusions. Data is collected in multiple stages to support the outcome.

At Step 1, “Business and challenge and Objective”, the business challenge and the objective are formulated and relevance is ensured. This is to make sure the study is needed and for the proposal, there are goals this study is trying to meet.

At Step 2, “Design”. Here the research is also designed and the approach and methods are planned. The structure of this work is created and documented to ensure the evidence trail and the objectivity are retained. Also, the quality of the outcome is ensured this way.

At Step 3, “Current State Analysis”. The CSA is carried out early on to ensure the literature reviewed in the next gate is relevant and the proposal building is focusing on the right issues and the outcome will be valid for the resourcing process that is studied in this thesis. This includes conducting interviews and online surveys. Internal data sources are also investigated to find qualitative and quantitative data to give a broad view of the current state.

At Step 4, “Existing knowledge”, relevant literature is reviewed to get to the best practice that is available in the business and academic literature to build the conceptual framework of this study.

At Step 5, “Building the proposal”, the proposal is created to improve the resourcing process by combining findings from the current state analysis and the literature. In this step, also the key stakeholders are involved in the building of the proposal. This ensures that the proposal is relevant and best meets the requirements of the company.

At Step 6, “Validating the proposal” the proposal is evaluated against the case company current resourcing process and the feedback is given by the stakeholders to see if the proposed improvements are feasible to be implemented.

At Step 7, “Final outcome”, the proposal is revised according to comments and feedback gained at the proposal validation workshop. In addition, the conclusions from the study are formulated at this stage.

2.3 Data Collection and Analysis

In this thesis, data was collected in three rounds, Data 1-3 collections. The research techniques in this study include using a questionnaire, interviewing key stakeholders, using participant observations and analyzing internal documentation. The interviews and questionnaires are shown in Table 1 below.

Table 1. List of interviews and questionnaires conducted.

| | Data type | Participants / role | Topic, description | Date | Length | Docu-mented as |
|---------------|------------------------|---|---|----------|---------------------|---------------------------|
| Data 1 | | | | | | |
| 1 | Face to face Interview | Respondent A1: Project manager | Using resourcing process in requesting competencies | Jan 2017 | 48 min | Field notes and recording |
| 2 | Skype Call | Respondent A2: Project manager | Using resourcing process in requesting competencies | Feb 2017 | 40 min | Field notes and recording |
| 5 | Face to face Interview | Respondent B1: Project director | Using resourcing process in allocating competencies | Jan 2017 | 33 min | Field notes and recording |
| 6 | Skype Call | Respondent B2: Group manager | Using resourcing process in allocating competencies | Feb 2017 | 52 min | Field notes and recording |
| 7 | Skype Call | Respondent B3: Group manager | Using resourcing process in allocating competencies | Feb 2017 | 50 min | Field notes and recording |
| 8 | Face to face Interview | Respondent B4: Resource manager | Using resourcing process in allocating competencies | Feb 2017 | 42 min | Field notes and recording |
| 9 | Face to face Interview | Respondent C1: Project manager | Effective use of resourcing process and the way allocations are handled | Jan 2017 | 20 min | Field notes and recording |
| 10 | Skype Call | Respondent C2: Change manager | Effective use of resourcing process and the way allocations are handled | Feb 2017 | 22 min | Field notes and recording |
| 11 | Skype Call | Respondent C3: Infrastructure Architect | Effective use of resourcing process and the way allocations are handled | Feb 2017 | 23 min | Field notes and recording |
| 12 | Skype Call | Respondent C4: Project manager | Effective use of resourcing process and the way allocations are handled | Feb 2017 | 20 min | Field notes and recording |
| 13 | Questionnaire A | Employees raising resource requests | Feedback for resourcing process and its issues | Feb 2017 | 110 / 425 responded | Online form |
| 14 | Questionnaire B | Managers handling the resource requests | Feedback for resourcing process and its issues | Feb 2017 | 2 / 7 responded | Online form |
| 15 | Questionnaire C | Employees being allocated | Feedback for resourcing process and its issues | Feb 2017 | 99 / 393 responded | Online form |

As seen from Table 1, the research techniques in this study included using interviews and questionnaires which were created to gain an overview of the current state of the resource request process.

Interviews were conducted to gain an in-depth understanding of resource requests and allocations. Firstly, managers who are responsible for creating resource requests were interviewed, i.e. project managers, service managers, and change managers. Then managers who are responsible for handling resource requests were interviewed. These include group managers and resource managers. Lastly, the employees who are allocated were interviewed to gain an understanding of the level of efficiency of the resourcing process.

In addition, the results from the interviews were analyzed and compared with the analyzed results of the questionnaires to ensure the reliability of the research. From these interviews and questionnaires, improvement ideas were also collected.

Three questionnaires, shown in Table 1, were created to gain observations from a wide employee base to ensure the validity of the data, not just the view of a few people. The respondents for the first questionnaire were managers who are responsible for creating the resource requests. The second questionnaire was for managers who are responsible for finding the requested resources and their allocations. The third and last one was for the allocated employees, assigned to complete the requested tasks.

In addition to the interviews and questionnaires, data from past resource requests and allocations were analyzed. Details of these data are, shown in Table 2 below.

Table 2. List of used company data sources

| | Name of the document and systems | Amount/ number of pages | Description |
|---|--|---|---|
| A | The case company Resourcing description.pptx | 17 slides | Process description, roles, and responsibilities |
| B | Resourcing tool | 15 149 rows of resource requests dating from 1.6.2013 to 24.1.2017 (date when the data was extracted) | Site where all requests are raised |
| C | C7 hour reporting tool | Hourly reporting and allocation entries from 1.6.2013 to 24.1.2017 | Tool for managers to follow allocations and actual hour reporting of specialist |

Table 2 shows the details of internal documents used for the current state analysis in this study. At the beginning of the current state analysis, the existing process descriptions

are gathered from the case company and analyzed to see how the process should work and gain insight into it. This approach is selected to gain the knowledge how the process is described in the company and to establish a baseline for the interview that follows.

The case company also uses two systems that are in scope of this study. One is the resourcing tool that is an intranet site where all the resource requests are documented. It holds all the data regarding the tasks for which the specialists are requested. The other is C7 hour reporting tool called "C.time". This is an in-house developed application that is used by specialists to report working hours to projects. It is also used by managers to compare allocated work to actual reported hours and to forecast workloads in the future.

For the purpose of validating the results of data collection from the interviews, data from the resourcing tool and C7 hour reporting tool were also analyzed to see if they contradict or support the results from the interviews. This information can be used when analyzing the way of work and the functionality of the resourcing process.

Data 2 collection was done when the initial proposal was created by conducting a co-creation workshop at the office. Also, Data 3 collection is done the same way during the validation of the proposal, as shown in Table 3.

Table 3. Data collection during proposal and validation phase.

| Data 2 | | | | | | |
|---------------|----------------------|--|-------------------|----------|----------|--------------------------|
| 16 | Co-creation workshop | Participants 5: Development Director, Solution Director, 2 Group Managers, Service Delivery Coordinator | Proposal building | Mar 2017 | 1h 28min | Online meeting recording |
| 17 | Co-Creation meeting | Development Director | Proposal building | Apr 2017 | 45min | Field notes |
| Data 3 | | | | | | |
| 18 | Validation workshop | Participants 4: Head of ITST, Development Director, Service Delivery Coordinator | Validation | Apr 2017 | 56 min | Online meeting recording |
| 19 | Validation meeting | Head of PMO | Validation | Apr 2017 | 15 min | Field notes |

Table 3 shows the roles of the involved stakeholders during the proposal building phase (Data 2) and during the validation phase (Data 3). When building the proposal, a co-

creation workshop and meeting was held with the stakeholders to create the proposal for improvement. In this workshop, the literature review was incorporated with the Current State Analysis to create a fact-based proposal.

During the validation phase, the created proposal was presented to the Heads of the IT services transformation (ITST) Nordic and project management office (PMO) to gain feedback to use when finalizing and aligning the proposal for the best fit in the organization.

Participant observations were also used since the writer has worked in the company for more than ten years as a specialist, project manager and, in his latest position, as a group manager, so all aspects of the process are known to the writer and been used regularly.

The data analysis tool used in this study is the Thematic content method of data analysis.

2.4 Thesis Evaluation Plan

To ensure the quality of the research, the data collection and analysis methods, as well as the research procedures, need to be evaluated against various evaluation criteria. For this thesis, the stress is placed on such criteria of research quality as relevance, validity, reliability and logic.

Relevance relates to questioning if the business challenge is something worth solving, and is the proposal relevant to the company. The definition of relevance is “The degree to which something is related or useful to what is happening or being talked about” (Cambridge dictionary) Benbast and Zmud (1999) describe four dimensions for relevance. *Interesting*, does it concern professionals, *Applicable*, does the work produce knowledge that can be used, *Current*, are the used sources at the time of publications and technologies, and lastly *Accessible*, is the study understandable and of style that is enjoyable by professionals.

In this thesis, the study was designed to be conducted within the case company and to ensure its relevance, the research design starts with establishing the business challenge and objective.

Next, validity and reliability are important measures for the quality of research. The concept of *validity* relates to questioning if the study “accurately reflecting the phenomena under study” (Ritchie and Lewis 2003). It also needs to enable the observer to trace the steps in both ways, from conclusions to the research questions and vice versa. The process should be so tight that evidence presented in the case report should directly correlate with the evidence collected during the data collection. When this is ensured the case study has taken into account the methodological problem of showing internal validity. (Dubé and Paré 2003)

Reliability relates to how accurate or able to be trusted someone or something is considered to be (Cambridge dictionary). By using referencing the reader can see what sources of information was used and evaluate the reliability of the information. Also, the clear indication how and what information is used contribute to the reliability of the work. (Dubé and Paré 2003)

In this study, validity and reliability are ensured by collecting data from multiple sources and using a mix of qualitative and quantitative data. These sources are presented in a detailed way to ensure that the evidence traceability is maintained.

The reliability is ensured by keeping field notes and recordings when doing fieldwork for later referencing and quotation in the study. Used quotations and figures are provided as to show the evidence of collected data. Reliability is also maintained by providing the references of used material that has been collected to enable the reader to follow the used material if desired.

Finally, *logic* relates to a formal scientific method of examining or thinking about ideas (Cambridge dictionary). This is evaluated by the logical chain of evidence. How well the chain of evidence is maintained and shown throughout the study, can the steps from initial questions to the conclusions be traced from section to section? (Dubé and Paré 2003)

In this study, the logic of the research process is observed by describing the research design in detail and following the process throughout the sections. The design of this thesis was described to give an overview to the methods, data, and evaluation that was used in conducting this study. During the work of this study teaching and peer reviews

of the material produced for each section were conducted to ensure the logic was followed. This feedback along the way was used to bring the outcome closer at each gate and ensure the outcome is achieved.

Next section analyses the current state of the resourcing process in the case unit and also summarizes its strengths and weaknesses. The goal is to find the areas where improvements would have the most effect and aspects that are already working satisfactorily.

3 Current State Analysis of the Case Company Resourcing Process

This section discusses the results of the current state of the resourcing process in the case company and how it is utilized. The goal of the CSA is to understand the usage of the resourcing process in the case company and at the same time identify the deviations of the process. The strengths and weaknesses of the process are examined to find the needs for improvements.

3.1 Overview of the Current State Analysis Stage

Firstly, for conducting the CSA, the analysis starts with an overview of the case unit and resourcing process. The current resourcing process is described and explained to clarify how it is designed to work.

Secondly, the analysis focuses on the strengths and weaknesses of the case company resourcing process. Within the second part, the weaknesses are further analyzed individually, how they manifest themselves and what effects they have on the everyday work. This part comprises the analysis of strengths and weaknesses illuminating the most critical shortcomings which are then unwrapped for deeper analysis.

Lastly, the results are consolidated and conclusions of the current state are reached, and the summary of the key findings is produced.

The current state analysis was done within the period of 25th of January – 16th of February through (a) eleven interviews, (b) an online questionnaire, (c) analysis of internal documents and (d) participant observations. The online questionnaire was directed to the same three groups which were also interviewed. All interviews and field notes were recorded during the interview. Interviewees were selected from different steps of the process. Those responsible for creating the requests and in need of the skilled employees, those responsible for finding the skills and allocating the specialists and lastly those that are the skilled specialists being allocated to the tasks requested.

Additionally, some internal documentation, and request and allocation data were reviewed to complete the view of the current state of the resourcing process. Specifically, these produced the process description of the resourcing process. Also, resource request data was collected from 1st of June 2013 to 24th of January 2017. This included

over 15,000 records of resource requests. Allocation and hourly reporting entries from the same time period were also collected. This included more than 260,000-time entries with comments of the tasks in progress.

3.2 Description of the Current Resourcing Process

In this study, the case unit, shown in Figure 4, is a project organization consisting of project managers and specialists. Specialists work in projects that are led by project managers and change managers using PRINCE2™ project management method. There are also tasks that are part of problem management, done to support service delivery and some smaller development tasks for customers that are requested by service delivery managers as well as sales support tasks. All these different tasks are dedicated to being part of the resourcing process.

Figure 4 shows the structure of the unit. Groups within the box with a yellow outline are the ones with resourcing and allocations examined in this CSA. This is mainly focusing on the Finnish resourcing process and its usage. Nordics share the resources in a way that other country organizations can request work from each other, but in order to facilitate this, they fill their local resourcing request forms.

The resourcing process is divided into three levels within the main process: (a) those who are responsible for opening the resource requests. These include project, service and change managers. (b) Those who handle the requests and allocate specialist employees. These are resource and group managers. (c) Lastly, the specialist employees that are being allocated.

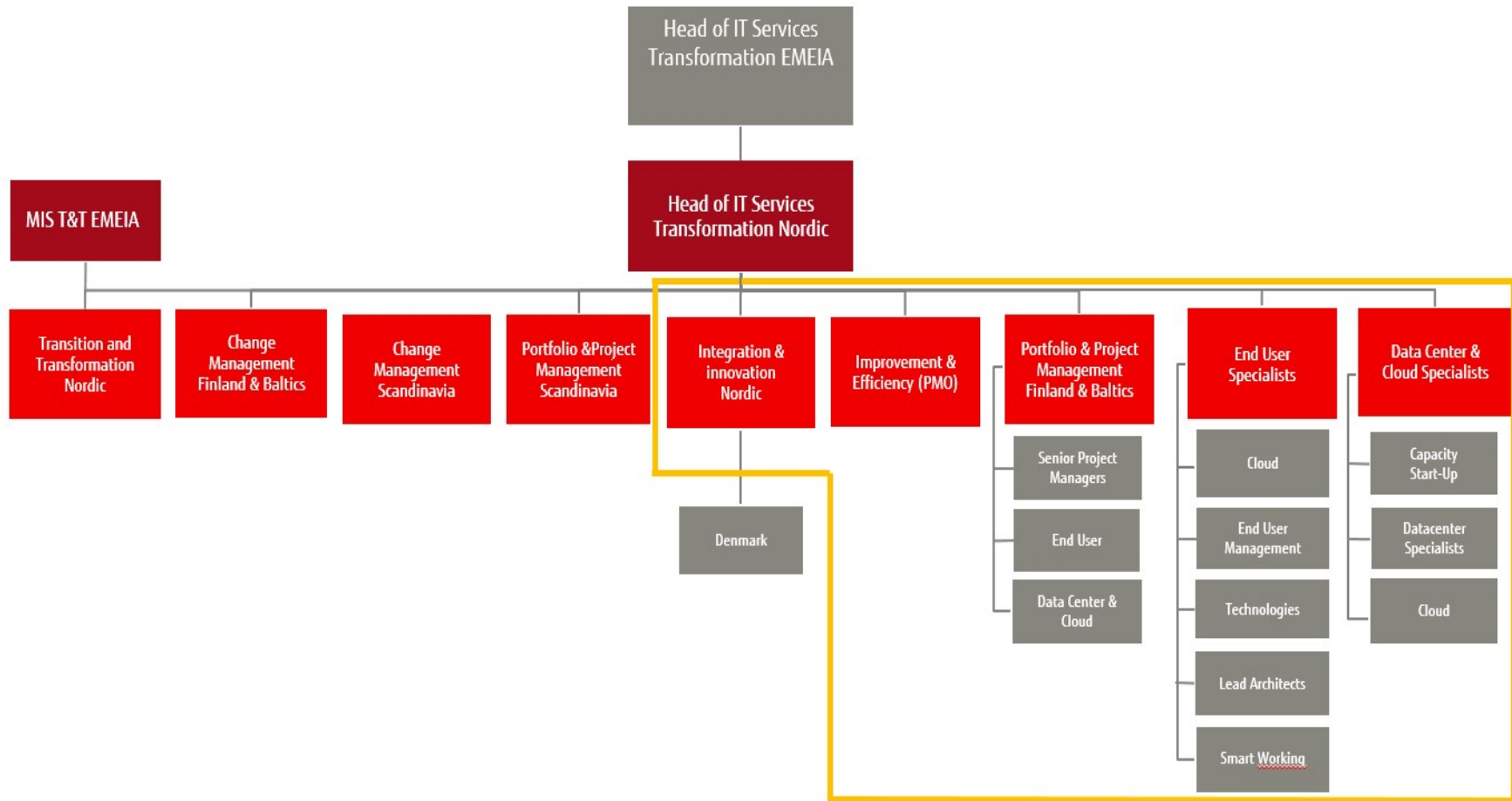


Figure 4. Organization structure of the case unit.

Next, the resourcing process, as illustrated in Figure 5, starts with the identification of needed work and ends when the feedback is received and handled.

When allocating specialists, a group manager is required to check if the customer is expecting employees to have specific security clearances. If so, then the specialist need to be audited before they can receive the authorization to work in the required environment. These authorizations are valid for three to five years at a time.

The new aspect is that there are offshore specialists also being allocated through the use of this same process and that is an additional check manager need to consider while looking for people to meet request specifications. Offshore workers cannot work in certain security audited environments. Additionally, all other customers are required to sign an agreement, requested by the EU, with the case company first, that offshore work is allowed. This information is kept as a separate list in the Case Company intranet.

Figure 5 depicts the flow of the resource requests starting with a person that needs the resource, opening a request for a specialist employee. At the initial stage (1), the important information is documented in the request by the person who needs a specialist employee to complete the requested task. Then (2) the group manager responsible for that technical capability will take it to find the person to be allocated. If there is no recognized group manager, the resourcing manager will appoint the next closest one to handle the requests.

When the requested capability is found (3) and the time and effort are fitting then (4) a specialist is allocated and (5) the person who opened the request is notified. Responsibility for assigning (6) the actual tasks is transferred to the person who requested the capability.

Figure 5 below shows the current resourcing process and the responsibilities therein

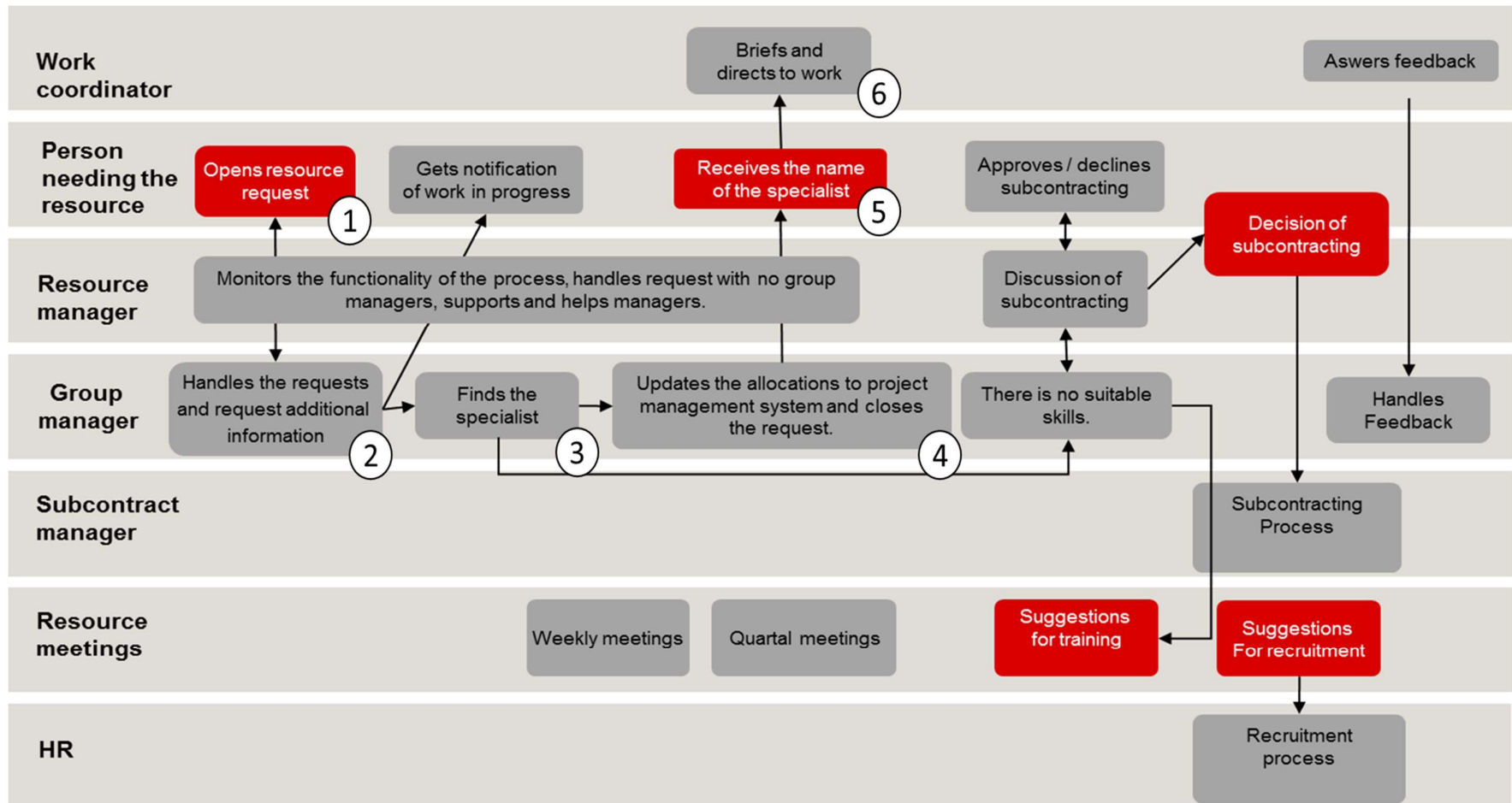


Figure 5. Resourcing process description.

3.3 Analysis of the Case Company Resourcing Process

The initial observation by the stakeholders is that the resource request process is regarded as a good and important process for finding the different specialist capabilities in the case company, but there are variations as to how the process is used. Some of these variations may not utilize the full potential of the process. The process is used in slightly different ways in different units. Within the particular unit that is the focus of this study the request part and allocation is, for the most part, handled in a unified way.

3.3.1 Differences in Requests, Allocations, and Reported Actions

From the current state analysis, it is evident that there is a difference in the requests to allocations and from allocations to reported actions. Here the differences and the causes are explained as they surfaced from Data 1 collected.

It was established that the current resource requests are used in two different ways. Firstly, they are opened when a new specialist is needed in a project or a change task. In these requests, the quality of data comes with wide variations. There are requests carrying all the needed data to handle the requests, but there is a big problem in the workload estimations, schedules and work descriptions. This is creating problems in the allocation phase where the managers try to identify a specialist for the task. The difficulties arise from the fact that it is hard to compare the available resources to the request when key information is indicative but the allocation should be definitive.

Secondly, new requests are created when the existing allocation is due to expire and the requirement for specialist employee is still there. Then the request is created to ensure that the already allocated resources can continue on the task. These are rarer than the occurrence of projects or change tasks been delayed. One of the interviewees said:

“If allocated hours for a task are exceeded, that cannot be helped in hindsight. However, when the schedule is delayed resourcing requests are made to ensure the continued use of the already allocated resources.” (Interviewee A2)

As seen from the comment, the third type of resource requests handling changed work effort is not regarded as important or used even. The resourcing process is describing

the third reason to create a request for resources when the workload changes for more than two working days' worth of work effort. Then there should be a new resource request to increase the allocations. From the interviews and questionnaires can be seen that this type of a request is almost never user.

The numbers in Figure 6 come from the resource request table, allocated work efforts and actual reported hours, collected and put together. These exist in two different systems so there was a need to consolidate the data.

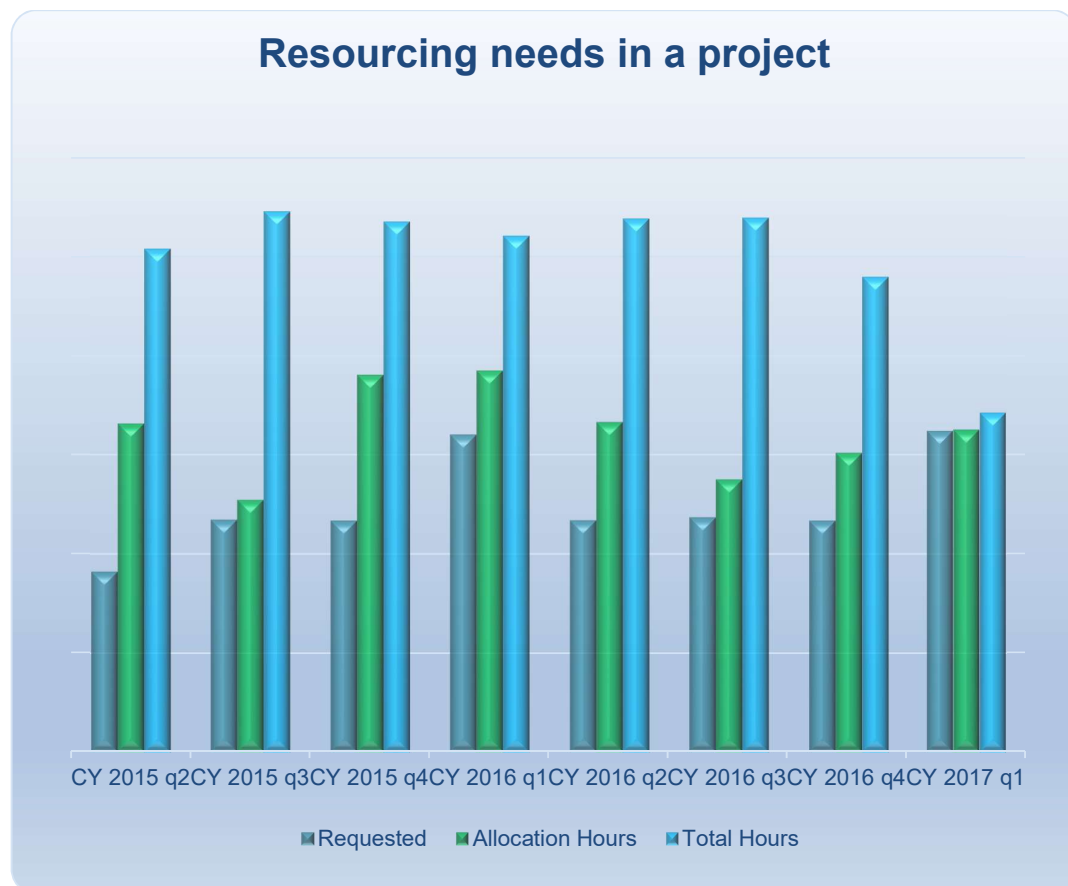


Figure 6. Resourcing process efficiency.

Figure 6 shows that there is a big gap between the requests and the actuals. The difference in requests and allocations is not so big but it is still significant in terms of predictability. From the reported actual hours, 50% was requested by the process and managers have allocated 65% of the reported hours. This shows that even though managers are going through allocations in one to one discussions with the employees there is still a big gap between the allocations and the real work. Administrative hours (vacations,

sick leave, training, self-development, etc.) have been taken away from the analysis of that type of resource usage is not currently part of the resourcing process.

Since the changes in the allocations are not properly handled with formal requests, some of the group managers are correcting the allocations orally during one-on-one discussions with the employees. There is also a weekly resourcing meeting where requests are handled and current allocations are studied. In these meetings, the allocation data is often not regarded as something reliable since the accuracy is very dependent on how recently the group manager has updated the information. Hence, the inaccuracy of allocation data is becoming acute as time lapses since when the information was last updated.

Based on the results of the current state analysis, the reported hours generally exceed the number of allocated hours since only a small amount of change requests are done.

3.3.2 Difficulties in Documenting Accurate Data in Resource Requests

From the interviews and questionnaires, it becomes clear that for the resourcing process to be efficient the quality of data in the resource requests has to be as good as it can be. If the information in the requests is vague or missing, it creates delays and faulty allocations. This is especially a problem with sales cases and at early stages of projects.

The analysis was started by looking at sales work since requests for resources for the sales stage always precede an existing project. However, one must point out the fact that the majority of the reported work is allocated for projects.

During sales cases, the content of the work is related to the Request for Information (RFI) or Request for Proposal (RFP) documentation that is delivered to the case company by the customer. From these documentations, the sales representative is extracting information covering what kind of technologies are required to fulfill the request of the customer. Once that information is clear, the sales representative then starts to create resource requests. In these cases, the timeframe to deliver the response to the customer usually varies from two to four weeks. This is a short period for the resourcing process and creates pressure to teams.

During a sales case, the opening of a project ID number to report hours takes time and since the allocation cannot be completed without that particular project ID number this creates friction between sales and the project organization. Many people are of the opinion that there should be a simpler process for the sales cases.

“During the bid phase, it can be very hard to estimate the work effort and schedule for a specific role or an individual specialist.” (Questionnaire Q6)

This comment from an answer to the questionnaire is from a sales person showing that documenting information for requests is hard when the schedule is tight and the content of the work is unclear at the initial stage.

Interviews with the project managers pointed that many projects are staffed at the start by creating multiple resource requests. A request is created for each individual specialist. After the bidding phase, the scope of the project is set during the negotiations with the customer. Using the contract and contract appendices, in particular, the project plan, the project manager gathers raw material for resource requests: information on the workloads, schedules, and descriptions. Project ID numbers are ordered by a different process that is not in the scope of this thesis. With this information, the allocating manager starts to find suitable candidates for the project.

It was said that the initial allocation is can be started already before the contract is signed to ensure that the work can start as soon as possible. This generates uncertainties and delays in the scheduling. Information is rarely conveyed to the allocating manager and thus the allocations are not scrutinized in line with changes in the schedule.

Discussion with the service delivery coordinator revealed that the quality of a resource request is generally better when project managers rather than service managers are creating them. Project managers are more informed of the requirements that are needed to efficiently handle the requests. Service managers are more ambiguous in their requests partly because they may not completely understand what they are asking for or they regard the resource request process to be a necessary evil rather than an important function.

“While planning a new project a service manager usually does not fully know what kind of expertise is required and what the workload will add up to. Because of this, a service manager ends up requesting resources before having a clear picture of what exactly is needed.” (Questionnaire Q6)

In a comment in the questionnaire, one service manager is pointing out that they are not knowledgeable enough to know what a project entails and for that reason, the request information becomes so general. After the person creating the resource request has acquired a specialist employee's name, they can plan the work and estimate the needs more accurately. This way of work creates requests where the estimated workloads are usually too modest, mainly because the requesting person does not know the full extent of the work. The expectation of the requesting person is that the same person initially allocated to the vague request is also delivering the planned tasks and thus the additional corrective resourcing requests are left undone. This comment also shows one evident aspect that when the work is progressing also the quality of following resource requests is becoming better.

Based on the results of the current state analysis regarding this part, revealed that there are issues regarding the quality of information in the resource requests and that there is lack of control in the usage of the resourcing process.

3.3.3 Creation of Unallocated Work due to Not Using the Resourcing Process

The concept of “unallocated work” describes tasks that the specialist employees are doing without official allocation or when they are continuing to work on tasks where the allocation has already expired. The continuing to work on a project where the allocation has ended is more common than the acceptance of new work without a resource request. It is also more common among specialists who have a deep and extensive knowledge in technology or wide-ranging prior service with the case company.

During the interviews with the specialists, the aspect of unallocated work was discussed. For the standardized work, the allocations and requests are used properly. This includes project work and change tasks. But for the more ad hoc work, the resourcing process is more easily dismissed and the specialists are contacted directly by email or phone. These ad hoc work efforts include sales cases and development tasks, also helping peers is generally handled this way.

“Either there is no knowledge of the process or the process is considered to be troublesome and not dynamic enough. Some may also think that the process is more suitable for project work.” (Interviewee C3)

One of the more senior architects was interviewed and two-thirds of his work came from tasks that originally emerge as direct contacts. Some of these tasks were at some later stage formally requested but some of them never received formal allocation documentation. The interviewee considered missing allocations to be more of a managerial problem than an obstacle for his own work.

Since the allocations are used also to forecast coming workloads and equalize the workload between and within groups the managers are also creating direct allocations without requests to gather a true picture of the situation. This is to lessen the offset of the unallocated work and ease the work to find available specialists. This way of working is not solving the problem, rather just coping with the issue. When the direct allocations are done without requests it does not increase the knowledge of the process with the employees responsible for creating the requests.

3.3.4 Diversity and Sufficiency of Specialist Employee's Skill Sets

It became clear from the 12 interviews that there is also a problem of sufficient reserve of capable specialists. There were many comments about a lack of skilled employees. This problem is causing hold-ups in fulfilling the requests and lost opportunities in sales, ultimately hurting the case company.

“Certain units just do not have resources to give. Lack of resources leads to the need to shuffle scheduled tasks in projects which in turn creates problems in the customer interface” (Questionnaire Q6)

This comment epitomizes the problem when specialists are not found. The end result is in most cases problems with the customer when given promises cannot be kept. Some of these acute problems are direct effects of the latest restructuring where redundancies took place and also key employees left the case company. Some of the slots left vacant by key employees have been filled but that is not the case in every unit.

Currently, the skill set of the specialists seem to be too narrow and the work is shattered to small fragments. The fragmentation of work leads to problems with handovers where one person completes his task and then the next one should continue. Here lie problems with delays when the next person cannot immediately continue the work where another person left. A situation where no one masters the big picture can leave some critical parts unattended thus creating major quality problems.

A narrow skill set is limiting the work that can be allocated and makes the allocation process harder. There are times when certain skills are widely requested and another specialty is less sought-after. When this happens, and employees are narrowly skilled, some end up carrying overloads whilst others have little to do around their specialist areas.

3.4 Summary of Key Findings from the Current State Analysis

The key finding identified from the current state analysis is that the case company currently has problems in the quality of information in the resource requests. This slows the progress of finding and allocating specialist resources. Also, the monitoring and thus control of using the resource process is not at an acceptable level. This is visible when reported hours are compared against the allocations or requested efforts. The differences make it hard to trust existing allocations to be correct when forecasting future efforts or trying to find available resources to be allocated to new requests. The last issue identified here is that there seem to be too few specialists with a wide and deep enough skills base to utilize whilst responding to varying requests. The effect of this is the uneven distribution of workloads and inability to respond to the requests within agreed timelines.

The main problems identified in the resourcing process during the current state analysis phase are shown in Figure 7.

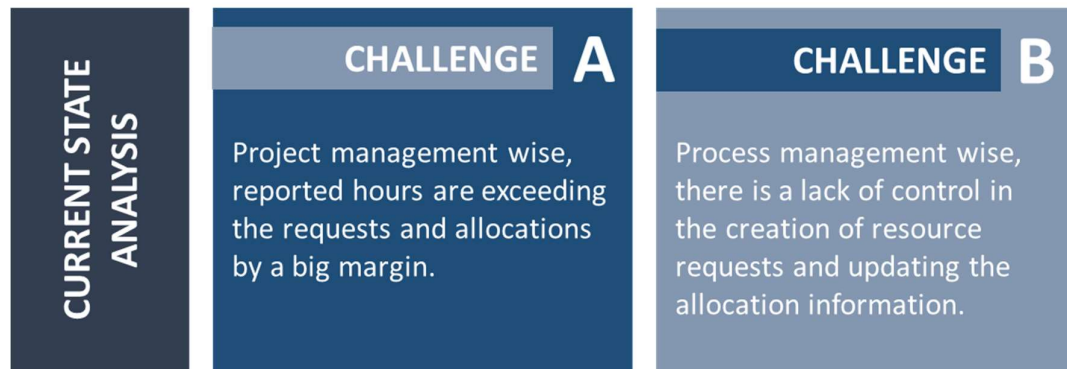


Figure 7. Identified challenges.

Main problems shown in Figure 7 produce the focus of this study hereafter and following Section 4 concentrates on literature search to identify relevant tools and concepts in order to create the proposal that is then built in Section 5.

4 Ideas on Improving the Resourcing Process Found in Relevant Literature

This section discusses the theories found in the literature that addresses the issues identified during the CSA. To begin with, theories of process management are examined. These address the efficiency of the business process and its measurements. Then secondly, multi-project management theories are studied, especially the ones that are related to using limited resources like Critical Chain management. From these theories, a conceptual framework is built for the proposal to improve the existing model of strategic resourcing to enable measured and tracked allocations of HR in the unit.

4.1 Business Process Management in Multi-Project Management

Business Process Management (BPM) focuses on enhancement of the corporate performance. It provides an opportunity to align organizational strategy with operations and evaluates the goal attainment with progress over time. (Frolick and Ariyachandra 2006)

BPM is examining areas from process automation and analysis to operations management and the ways to organize work in a company. It also aims to improve business processes without, if possible, introducing new technologies. When improving the performance of a process it is more beneficial to focus on the process performance issues rather than the objects produced by the BPM techniques and tools, for example, process models. Thus the process better meets the strategic objectives of an organization. To measure these process improvements, the use of Key Performance Indicators (KPI) is a good practice. (van der Aalst et al. 2106)

BPM Standards group (2005) published an industry framework to establish the BPM and create a unified way of addressing the process management. In that, they describe four key processes that support the application of BPM. They are: Strategize, Plan, Monitor and analyze and Take corrective actions. Figure 8, as depicted by Frolick and Ariyachandra (2006), shows the iterative way of working where the flow feeds itself.

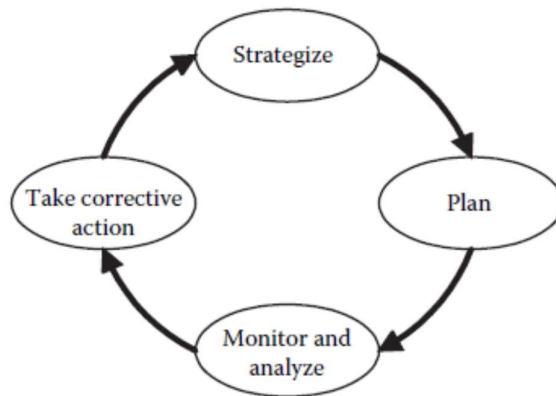


Figure 8. The BPM Framework (Frolick and Ariyachandra 2006:43).

Figure 8 shows that the process circles back to the start position and is continuously adjusted by the changes in the environment to keep processes up-to-date (Frolick and Ariyachandra 2006). Key drivers for using performance management is to tie strategy to operations, identify effective performance measures and providing a framework to improve communication of strategies to the stakeholders (BPM Standards Group 2005).

The target of the Strategize phase is to identify what the organization is trying to achieve. Here the performance metrics are linked to strategy to ensure that the goals and measurements are aligned. Strategy mapping is many times used to identify business value drivers, which leads to a discovery of the Key Performance Indicators. (Frolick and Ariyachandra 2006)

Following the Strategize phase, the Planning phase draws the plans to achieve the goals. Here the operative work is planned and the budgets are made to meet the goals of the organization. Here the units work for cross-functional operations plans to ensure that a corporate-wide focus is observed and to overlapping tasks avoided. Stivers et al. (1998) also pointed out that while the identification of metrics and the measuring are important, equal importance should be placed on the design how the numbers are used in the action phase. (Frolick and Ariyachandra 2006)

Next, in the Monitoring and analyze phase the influence and benefits of the balanced scorecard become more visible by providing operational and strategic reporting and analytics to all levels of management. This phase allows both the unit and individual see their performance and, if necessary, take appropriate action. (Frolick and Ariyachandra 2006)

Finally, making the corrective actions is a logical step from the monitoring to ensure that the initially set goals will be reached. By using the information of the monitoring phase problem areas can be found and the needed actions become more visible when the metrics are set correctly. (Frollick and Ariyachandra 2006)

While the process improvement is important, in a dynamically changing business environment it is also vital to explore new ideas and ways of working with the process. Sometimes radical ways of working might be better and bring greater gains in the working environment than just creating small improvements in the existing process. (Nga et al. 2015)

The importance of correct KPIs come forth when decisions are made based on that. By using Balanced Scorecards (Kaplan and Norton 2001) and Strategy Mapping (Frollick and Ariyachandra 2006) companies can spread the monitoring to a wider field of metrics to ensure that the information collected is reflecting the real situation.

4.1.1 Lean Performance Management

One of the ideas in Lean is optimizing the process flow. The usual way for companies to proceed is to optimize resourcing. This way all resources are used to the max rather than optimizing the flow of the work object. The efficiency of the process is measured based on how fast the work object is going through the process. Work is observed from the perspective of the object. All actions that move the object forward are regarded as value-add tasks and work that is not moving the object forward is regarded as waste. The idea is to remove as much waste as possible to maximize the value-add functions. (Modig and Åhlström 2012)

For the above to become reality, every function in the process needs to aim for the same goal. The goal for a function is to become leaner. Therefore, all functions must have knowledge about others, must accumulate knowledge of other functions, gather best practices of itself by systematically collecting and deploying these in use, and then teach it to others. This way the organization becomes a learning organization and can better facilitate the process by all functions supporting the efforts of others. (Womack and Jones 1994)

Performance management in Lean is trying to address the process continuously by collecting the data of things performing at satisfactory levels and initiating improvement actions without waiting for the numbers to indicate the problems. This is a different approach to the performance issue than what the KPIs are also trying to solve. Schonberger (2008) is arguing that KPIs are many times removed from the process and measure the actual-to-goal gap to indicate that there are problems, and then someone is assigned to investigate and perform corrective actions. The Lean process management's results are continuously collected and actions are initiated when issues are identified.

While the constant activities to improve the performance take place, the KPI measurements need time to reveal valuable information. One month is a short period of time to come to conclusions. When using scorecards there is need to examine trends to see where higher level intervention is needed. Higher level KPIs need to be shifted to monitor numeric process data to give valid information for managers to work with. (Schonberger 2008)

To efficiently follow processes. Metrics should support the process in a way that they point out what to do when goals are not met and set by people who know the process and whose work revolve around the measured process (Schonberger 2008).

One good tool from Lean management is to create Statistical Process Control (SPC) chart. This will monitor the process and its behavior. Setting the upper and lower level limit to third standard deviation the normal process can be followed and occurrences that need further investigation can be easily noticed. (Torkkola 2015)

Figure 9 below shows an example of a SPC chart where the amount of completed task during a day in the process are followed.

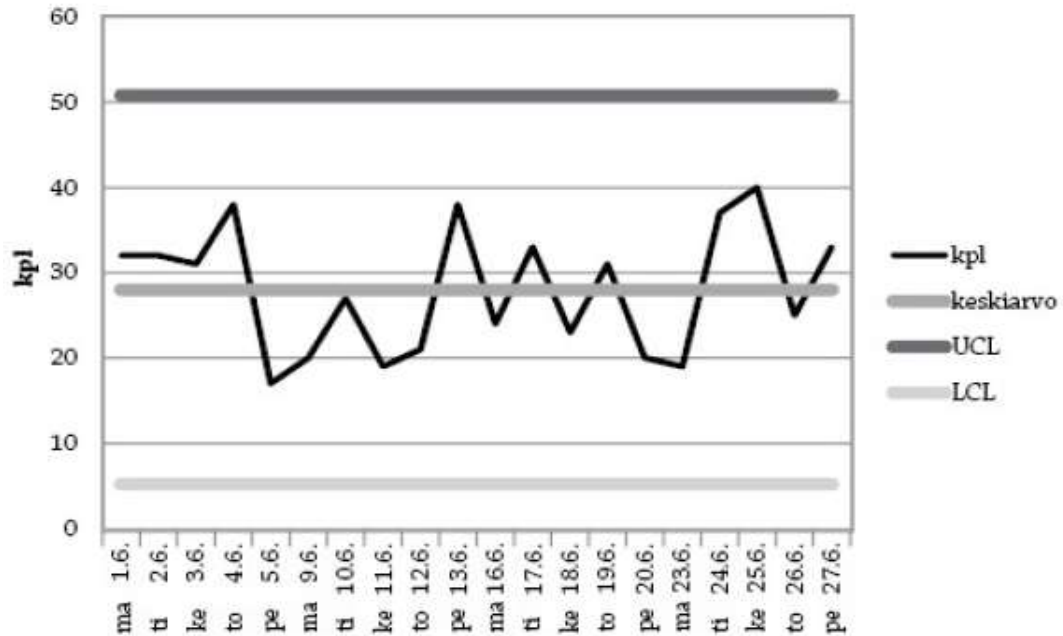


Figure 9. Statistical Process Control chart (Torkkola 2015: figure 11.5).

Figure 9 shows a picture of process behavior. There is the calculated average, Upper Control Limit (UCL) and Lower Control Limit (LCL) lines. These are calculated from the actual events. If there is an event that goes over UCL or under LCL those events need to be examined in more detail. Other events are within normal behavior and do not need special attention. This points out meaningful deviation from the normal. Managers do not need to divide attention to minor things but can work with meaningful events to enhance the work and process.

$$UCL = [\text{Process measurement average}] + 2,659$$

* [standard deviation of process measurement]

$$LCL = [\text{Process measurement average}] - 2,659$$

* [standard deviation of process measurement]

Torkkola (2015: figure 11.5) describes four metrics for specialist work measurements. These are Demand, Throughput rate, Unfinished tasks and Throughput time. With these measurements in a SPC chart, the work of a specialist can be monitored and deviations will become evident for further study.

4.1.2 Using Balanced Scorecard in Performance Monitoring

Balanced Scorecard (BSC) is a system based on the idea that financial metrics alone are not sufficient when corporate performance is measured (Kaplan and Norton 2001; Jalbert and Landry 2003). Successful implementation of BSC starts with the communication of a vision for performance that is vastly better than the current way. Then the focus is moved to management with emphasis on teamwork to achieve the new performance model. Gradually a new system evolves that incorporates new cultural values and structures. The element of change is present when initiating the BSC program and this needs to be communicated clearly (Kaplan and Norton Sept 2001).

Traditional management focuses only on financial measures and tactics, while BCS focused management is addressing strategic issues, teamwork and learning (Kaplan and Norton Sep 2001). The balanced scorecard is addressing this problem by linking the vision, mission, and strategy, to performance measurements. The typical balanced scorecard has four perspectives: financial, customer, internal business, and innovation and learning. When the goal is to have functional and long-term measurements BSC can be considered a valid choice. Figure 10 shows a typical balanced scorecard. (Jalbert and Landry 2003)

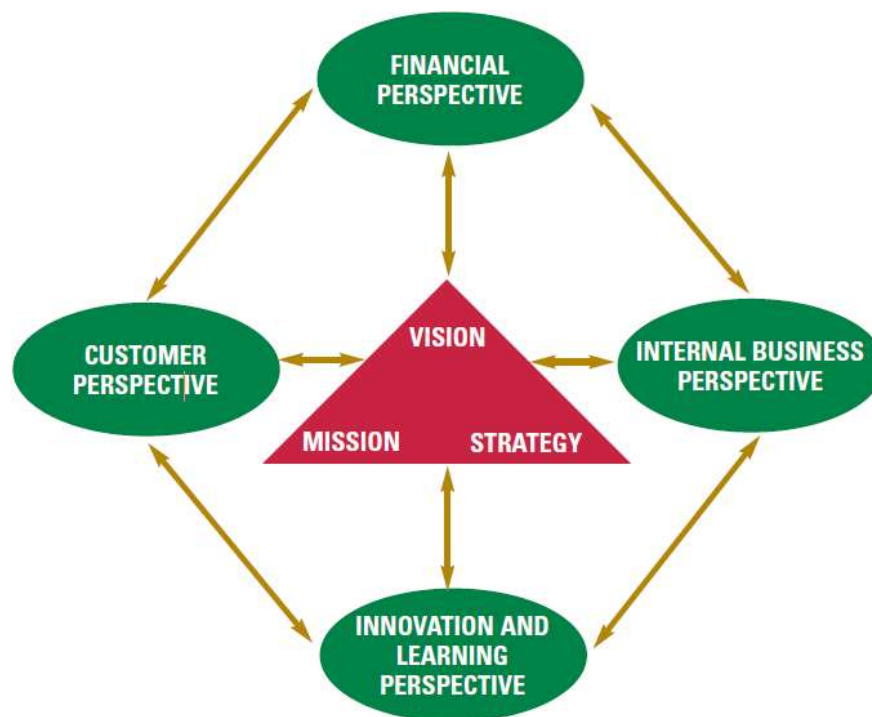


Figure 10. A Balanced Scorecard (Jalbert and Landry 2003:36).

-Figure 10 shows the linkage of the four aspects of the balanced scorecard. These four aspects, Finance, Customer's perspective, Internal business, and innovation and learning, should always be considered when creating a balanced scorecard.

The Financial aspect relates to the company financial objectives. In a way, these redefine expectations from the company strategy, turn them into numbers. This can have any number of measurements. There is a warning to use extra special care when selecting these because the measures incorporate elements of both risks and return.

The Customer aspect relates to the wants of the customer. Satisfaction is a big part of this element for achieving company success. Customer's satisfaction ensures loyalty, repeated development orders as well as good references when searching for new customers.

The Internal business aspect is identifying internal activities that are critical to company success. This is about a production of goods or services and involves the work process development that is minimizing the costs and maximizing the quality.

The Innovation and learning aspect is about adjusting to customer's constantly changing needs, perceptions and expectations. Because of these a company must constantly evolve and improve its way of working and services by innovating and learning. This encourages investment in future growth in areas that are part of strategic decisions. (Jalbert and Landry 2003)

The use of balanced scorecard enables a company to monitor and examine a process or an activity from varying angles. By working this way, it is harder for management to play with the numbers and try to improve only one aspect rather than having a holistic approach to the issues. This will also show if some aspects are left unnoticed, as well as where improvements are needed.

4.1.3 Improving Management Performance Using KPIs

Key performance indicators are financial or non-financial measures used at different levels in the organization to indicate the level of success in achieving objectives, strategies, and plans. These indicators show the efficiency of the organization and individuals. They

also influence the behavior of individuals when the employees try to find ways to achieve the set goals. (Ferreira and Otley 2009).

According to Kaplan and Norton, what is measured affects the way how managers and employees conduct their activities. Changing or realigning the measurements can help organizations to deliver improved performance. Determining a good performance of the organization is not just limited to what is measured but how the results are used. The multiplicity of management processes where the measurements are used can reinforce the impact. For example, communication and education, setting objectives, linking the measurements to strategy, planning, budgeting, resource allocations and so forth. (Kaplan and Norton Jun 2001)

To use KPIs efficiently there are some downfalls that need to be avoided. One is that the measurements are only compared with the units own numbers. This doesn't reveal the relative performance of the unit. There needs to be a comparison with other units in the company and preferably some benchmark number to compare the results with. Another thing is to just look at the rearview mirror. The effective KPIs should give direction for future decisions and enable the measurement of the correctness of decisions. Looking back reveals how accurate past KPIs have been in supporting decision making. Measurements need also to be varied in type, for example, time, effort and quality, to avoid gaming of the numbers. It is humane for managers that are measured by certain KPIs to try and maximize the numbers of their group. When the measurements are varied it gives a more realistic picture of the situation and also lessens the possibility of fixing the numbers. (Likierman 2009)

Finally, another thing to consider is how long something should be measured. A saying goes: "you get what you measure" indicating that the measurements will shape how employees act. With this, the measurements need to be examined periodically to see that they are still valid and contribute to the performance as needed.

4.2 Multi-Project Management

Business practice suggests that one of the main challenges for a multi-project environment is the allocation of scarce human resources (Ponsteen and Kusters 2015). It is also key for companies to stay competitive (Bower and Gilbert 2007). The current working

environment has many simultaneously ongoing projects where employees are participating in different stages at the same time. In this situation, one resource is simultaneously allocated to multiple projects. This creates a problem with prioritization.

These parallel allocations create multiple problems: deliveries behind schedule, over-budget spending, and under-par quality, also multiple project jams caused by limited resources. Many organizations are solving the surface issues by trying to get people to work harder or bypassing documentation and not tackling the root causes of organization's overall problems with structure and capabilities. Prioritization of projects and regular communication of status are important activities when solving resourcing problems. (Marcia 2007)

Multi-project environment is shown in Figure 11 below.

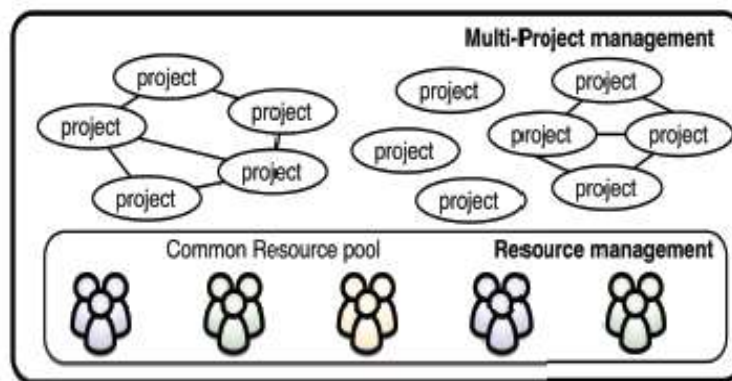


Figure 11. Multi-Project and Resource management (Ponsteen and Kusters 2015:166).

Figure 11 shows an example of a multi-project environment where there are multiple interconnected and independent projects that are drawing resources from the same resourcing pools. With this comes the problem of project prioritization and resource allocation between different projects. This environment needs different management methods than single project environments. (Ponsteen and Kusters 2015)

Dooley et al. (2005) state that in a multi-project environment problems are more than the sum of individual project's individual problems. There are three major areas that need to be managed well to achieve most effective outputs. These are alignment management, control, and communication, as well as learning and knowledge management, discussed below.

4.2.1 Theory of Constraints

Theory of Constraints (TOC) says that all systems have constraints that limit the output (Leach 2005). These are identified as bottlenecks that constrict the flow through the system. The chain is as strong as its weakest link. There is no impact on the strength of the chain if most of the links are enhanced, but the weakest remain intact. (Leach 2005)

Golmohammadi (2015) is suggesting that when two tasks, different in priority, are competing over the same limited resources priority should be given to the one that will be completed in time even if it is the one with initially lower priority. This is to lower the wait time for whatever comes next. In Golmohammadi's example, two products were produced and delivery time to a customer was measured. In this case, the higher priority product needed more actions after the stage of work under competition and the lower priority product was ready for shipping to the customer immediately after the bottleneck was successfully passed.

To reduce the project time with TOC, only the project manager is committed to the project delivery date. Lower levels project staff are expected to give estimations and communicate expectations. This is done to remove the contingency reserves from the activities and have a buffer only at the project level. Schedules are self-fulfilling prophecies resulting in work being expanded to fill the available time. It is basic human nature that when the prophecy is removed from the individual task then the schedule can be made tighter and overall time reduced. There is also another implication that work tends to start as late as possible and that leads to unnecessary use of contingency reserves. This way of working creates pressure to constantly and systematically monitor risks relating to delays (Steyn 2001)

4.2.2 Different Resourcing and Scheduling Models in Multi-Project Environment

Examined resourcing and scheduling models found in the literature included (a) Critical Chain Project Management (CCPM), (b) Constant Number of Projects in Process (Con-PIP), and (c) the PRINCE2™ project management method. Especially the managing product delivery process is examined to gain more knowledge on how it is describing resourcing.

Critical Chain (CC) methodology is a popular technique in many organizations dealing with multi-project environments (Cohen et al. 2004). Its intuitive planning, scheduling and control methods are much needed in multi-project systems. It correctly acknowledges the interaction between task precedence and resource constraint relationships. (Cohen et al. 2004)

Critical Chain Project Management (CCPM) relates to aggregating the risks of individual tasks to the project level. The risk of delays is hardly happening with every task that is needed to deliver a project. But if tasks are estimated individually by specialists they will add their own contingency reserves for their tasks and give bigger estimations as a result of this. The differences in estimations is shown in Figure 12 (Steyn 2001).

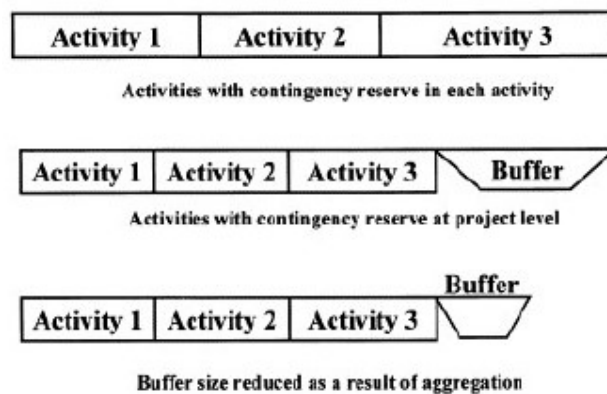


Figure 12. Reduction of project duration as a result of aggregation (Steyn 2001:365).

Figure 12 shows how the total contingency reserve from the project level can be aggregated. The fact that the probability of all tasks using their contingency reserves is so small that it is unnecessary to increase the cost and duration of the project by this measure. This way an individual project can be estimated and completed in shorter time. (Steyn 2001)

CCPM is a TOC tool for planning and project management (Izmailov 2016). It can be used both in single-project and multi-project environments where resources are shared among many simultaneous projects. It strives to eliminate negative working behaviors like finishing tasks at the last possible moment. It creates a plan which shows the relationships of tasks and resources and the needed time to perform these tasks. This creates a schedule of work that displays the Critical Chain. A multi-project environment has

one extra element compared to single-project environments: a tool called “drum”, aimed at synchronizing the implementation of projects. (Izmailov 2016)

The drum is the constraint resource of the organization that is used for scheduling multiple projects (Leach 2005). The primary objective of the CC drum is to minimize the lead-time. Other resource capacities than the drum are exploited to maximize the use of the drum. The scope of the project is regarded as a constraint (Ponsteen and Kusters 2015).

Cohen et al. (2004) note that in a multi-project environment, where projects are starting and ending all the time, finding the drum that is key in CCPM is hard and that the buffer management might not be sufficient to meet the planned schedules. They argue that in some cases other control methodologies such as Constant Number of Projects in Process (ConPIP) can give a similar and sometimes better performance and still maintain the desired level of delays.

While the CCPM focuses on scheduling according to the drum schedule, ConPIP is more focused on the idea of how many overlapping projects are ongoing. This is a simple control policy with minimal investment demands on the organization. ConPIP is a good alternative when there is flexibility in project starting times. (Cohen et al. 2004)

ConPIP limits the number of projects that are allowed in the system to a fixed number. If a project arrives when the system is serving a set limit of projects, it will wait on the backlog list. When a project already in the system is completed, the first project from the backlog is activated and started. If the backlog is empty, then any project set for a start is immediately activated. When a project is activated it is split into tasks and relevant resources take the tasks when they are ready. (Anavi-Isakow and Golany 2003)

When the projects in the process are limited, the effects to the top priority are minuscule but projects with lower priorities will have a big impact on their completion time. This is shown in Figure 13.

Figure 9 New Products Project Completion Time with Input Control

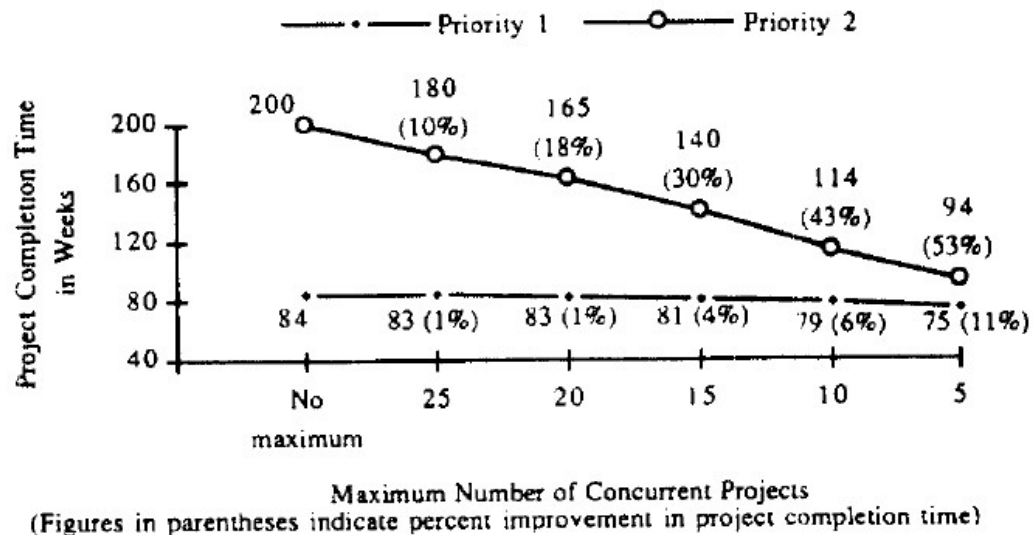


Figure 13. New Products Project Completion Time with Input Control (Adler et al. 1995:481).

Figure 13 shows how, by limiting the maximum number of active projects in the system, the overall completion time is lowered and more projects can be completed in a shorter time (Adler et al. 1995). The catch lies in the prioritization of projects to cope with the limited number of ongoing projects. When there is room for projects they are activated according to the expected finish date of the project and when the limit is reached rest of the projects are placed in the backlog in order of scheduled finishing time (Anavi-Isakow and Golany 2003, Cohen et al. 2004).

PRINCE2™ is a method of managing projects. It is widely used in many countries. It was developed by the UK Office of Government Commerce (OGC). It has a collection of best practices and governance model for projects done in a way that is applicable regardless of the type or size of the project (Murray 2009).

PRINCE2™ method describes the Managing Product Delivery process that is about the interaction of project management and project teams. It gives formal requirements on

accepting, executing and delivering project work. Figure 14 visualizes the movement of the work package between project management and team management. (Murrays 2009)

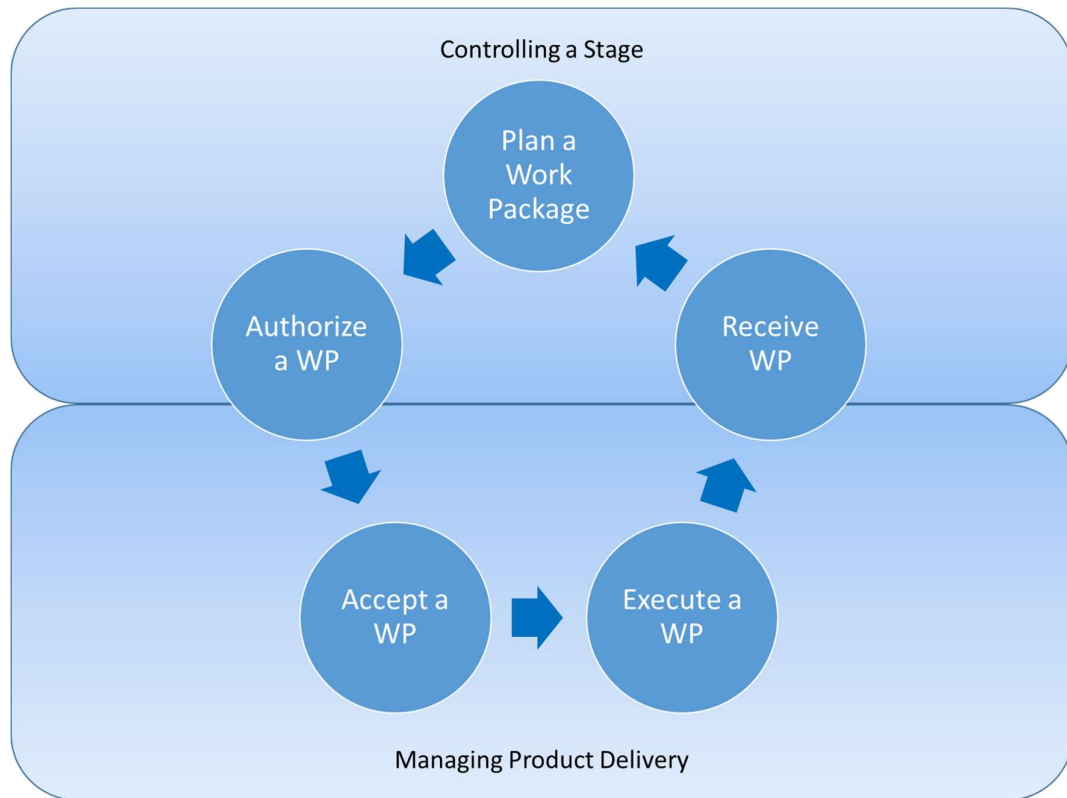


Figure 14. Managing Product Delivery (based on Murray 2009:185).

Figure 14 shows the activities during the managing product delivery process. Managing Product Delivery process focuses on the transition of the work package (WP) from project management to team management. It places emphasis on the acceptance of the work package that is done by the team executing the WP and the delivery of finished WP pack. The work package plan is one of the deliverables of controlling a staged process. WP plan is handed over for execution in the managing product delivery process by the managing a staged process. Managing product delivery process describes documentation that is done during the move of WP between Managing Product Delivery process and the Controlling a Stage process.

4.3 Conceptual Framework

Conceptual framework of this Thesis consists of two main topics: Business Process Management (BPM) and Multi-Project Management. These two areas give a theoretical background and best practices to create the proposal for enhancing the strategic resourcing process of the case company. The conceptual framework is visualized in Figure 15.

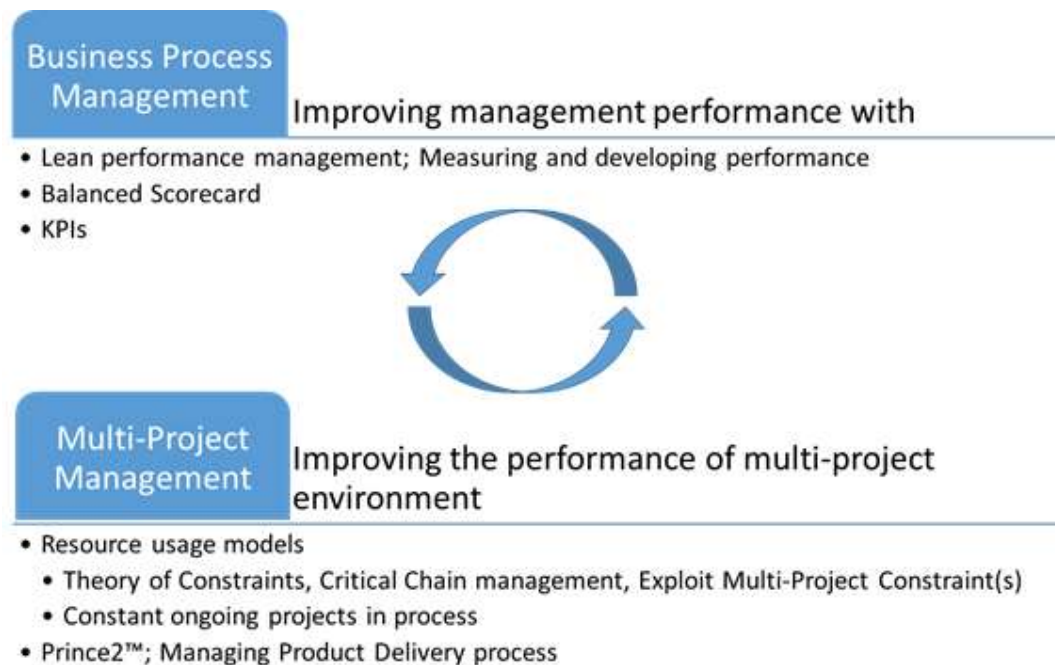


Figure 15. Conceptual Framework.

Figure 15 shows the themes for the proposal and the underlining tools and techniques. The first topic of BPM is encapsulating ideas of process development and to answer the need for a more structured way of using the process. It includes good measuring policies and how those measurements should be incorporated into the management of the process and everyday work. Lean performance management gives analyzation tools to follow the process and start corrective action before the KPI metrics are showing deviations in the process. The balanced scorecard is used to determine metrics in a way that if managers try to optimize the process partly to make numbers look good other areas will show the lack of attention or partial optimization of the process.

The second topic Multi-Project Management is encapsulating ideas of managing resource allocations in a multi-project environment. The fact that there are many projects ongoing simultaneously and in different stages as well as the existence of corresponding resourcing problematics creates a need for tested and proved methods. It examines the resourcing aspect and project management when there are conflicting needs and how they can be handled.

From these topics, the proposal will be drafted in the next section to address the problems that were identified during the current state analysis. In Section 5 the initial proposal is drafted in a co-creation process with involved stakeholders, and their input is gathered to create the proposal that will best address the issues identified in the current state analysis.

5 Building a Proposal of an Improved Resourcing Process for the Case Company

In this section, the improvement proposal is created to address the findings from the current state analysis using the knowledge gathered from the relevant literature. This is created in workshops with relevant stakeholders to ensure the involvement of affected parties. This helps the future work when implementing the changes. The proposal will include changes in the process and creation of new measurement practices.

First, an overview is given of the proposal building. It is followed by summary of the elements that are involved in the proposal and lastly, the two elements are described in detail.

5.1 Overview of Proposal Building Stage

The proposal is built in three steps. To create an evidence-based proposal, first, the current state analysis was conducted in the case company to investigate the situation that is now observed from many perspectives. Employees were interviewed and the online questionnaire was done to obtain confirmation of the views of interviewees from a wider coverage of the stakeholders in the resourcing process. These employees were from many stages of the resourcing process, people creating requests, those who process the requests, and employees that are allocated to the requests. Also, the numbers from the company systems related to resourcing were extracted and analyzed to see whether they support the results. According to the findings in the current state analysis, there were problems identified with the allocation data that do not reflect the reality of the conducted work efforts. Due to this lack of accuracy, the forecasting and future allocation become difficult. This also creates problems in finding available specialists, and this will later in the process emerge as lack of specialists and their skill sets.

Next, to address these challenges, Business Process and Multi-Project Management literature was reviewed to find relevant articles and studies to support the knowledge-based proposal building.

As a last step, the results from the CSA (Data 1), literature search, and input from the stakeholders (Data 2), the proposal is built which is divided into two parts. The first part is a change in the process responsibilities when the allocations are handled and the

second part is about creating monitoring practices to effectively follow the allocations and produce data for future improvements. The Correlation of CSA findings and the parts of the initial proposal are shown in Figure 16.

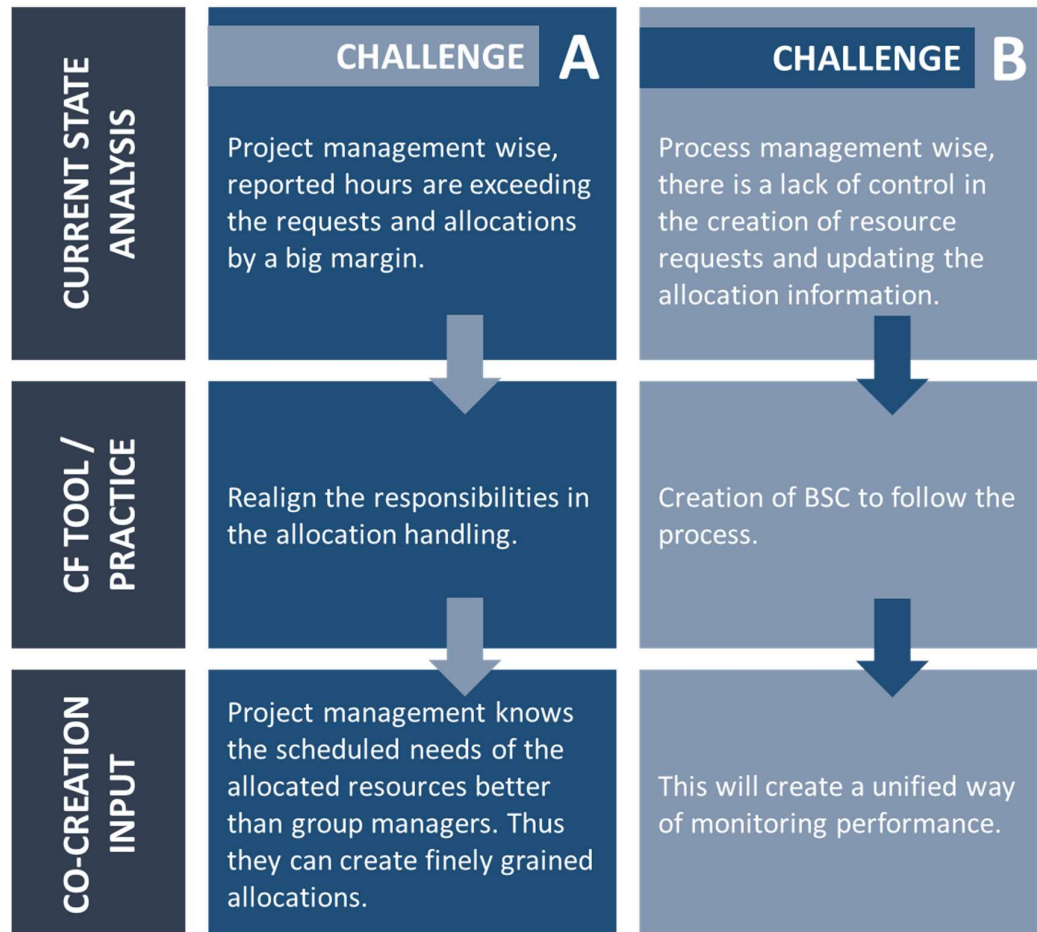


Figure 16. Relationship of CSA findings and parts of initial proposal.

Figure 16 shows how the CF is used to address the issues found during the current state analysis. It also summarizes the results of initial co-creation workshop that was facilitated to create the initial proposal.

5.2 Summary of the Initial Proposal

The initial proposal is two parts. First one is the new resourcing process with realigned responsibilities to better meet the expectations of the projects and change tasks that are requested. The second part is the introduction of the Balanced Scorecard to gain

more control and visibility to the workings of the resourcing process and specialist employees.

First part is to lessen the gap from requests to allocations to actual work. In the current state analysis, it was shown that only 50% of the reported work is actually requested and 65% is allocated. Also, the project management model of PRINCE2 is stating that work packages should be handled by the project management to the delivering party that then accepts the work package. This way of acting ensures that both parties know what is expected.

The changes in responsibilities regarding allocations ensure that project management and specialists both agree on the allocations. This ensures the commitment of specialist to the allocations. It also gives more accuracy in the allocations scheduling and division of efforts required during the allocation.

The second part is the introduction of Balanced Scorecard. This is to ensure that the changes are monitored and followed. It will also give more diverse and informative measurements of the unit's overall performance. The reasoning to use the BSC is that it gives measurements of performance from many aspects of unit's activities. This is making it harder to play the numbers by just partially optimizing the activities.

The structure of the initial proposal is shown in Figure 17.

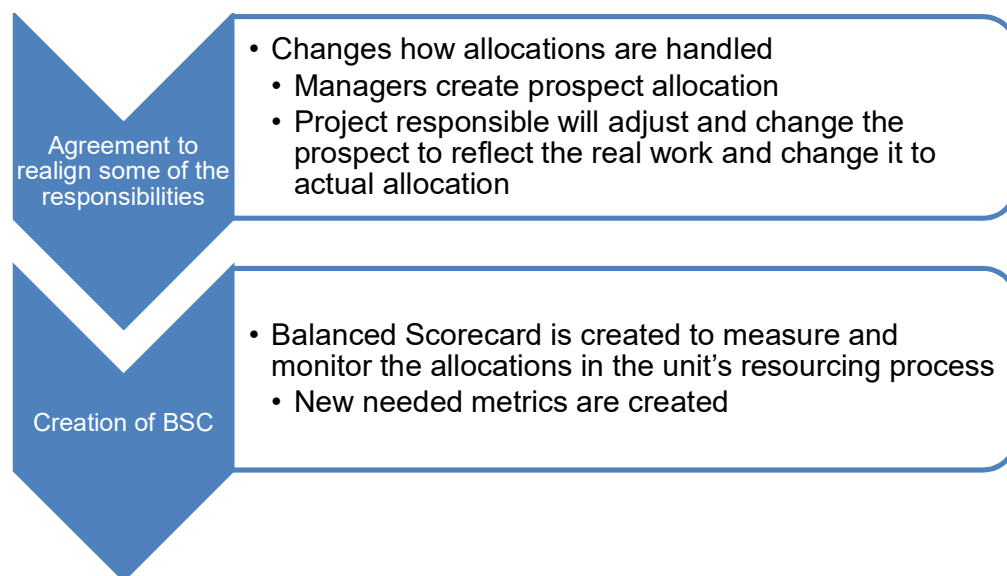


Figure 17. Initial proposal for solution.

Figure 17 shows the two parts of the initial proposal. Implementation is started by piloting the first and measuring the results and experiences with the latter.

5.3 Improving the Resourcing Process by Realigning Responsibilities

The goal to realign responsibilities in the resourcing process is to have more realistic allocations and resource utilization forecasts.

The first suggested improvement is about the responsibilities of the resource request process and the way group and project managers handle the C7 allocation in the allocation tool. The current strategic resourcing process has the group managers allocating work for the specialists. This is a difficult task to accomplish in a way that it would accurately correspond with the scheduling and work efforts of a project. Due to the nature of project work, there are periods where different kind of specialist work is expected in the project. At the start of the project, certain tasks need to be completed before the following ones can be started. As a result of this allocations cannot be flat throughout the project. The allocation problem is shown in Figure 18.

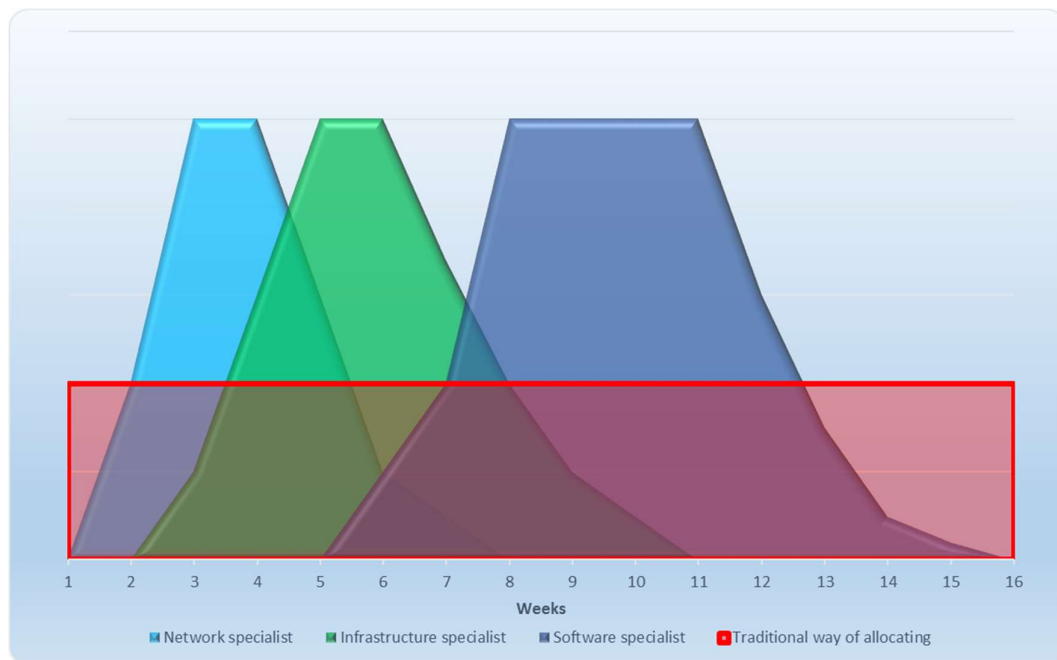


Figure 18. Visualization of work efforts in a project.

Figure 18 illustrates the variation of different specialist work efforts when the project is advancing. Flat allocation is like a broken timepiece: for a split second, the correct time appears, but only twice a day. For much of the extent of a project, allocations are either too small or too big. This has effects on the resource planning of projects and utilization of specialists.

Resourcing requests that are opened by the project or service managers have usually only rough information regarding the content of the requested task. Requests do not have the work efforts documented according to the project plan phasing. Group managers do not have the possibility to be familiar with the project phasing of all the ongoing projects at a level that would allow them to accomplish properly weighted allocations for specialists. So they can only achieve flat allocations in accordance with the requested scheduling by dividing the workload evenly throughout the whole timeline. Instead, allocations should reflect accurately the reality of expectations in a Multi-Project environment. The accuracy of the expected effort is increasingly important because it allows the resource planning to be conducted at an acceptable level.

To better meet the forecasting needs of allocation, the current responsibilities for the resourcing process should be changed to allow more accurate allocation planning. This can be achieved by realigning the allocation handling responsibilities. The new allocation process allows the allocating manager to produce a prospect allocation, whilst the project management office (PMO) and the work coordinator carry the responsibility of fine-tuning the prospect and turn it into a final allocation. Project management office represent(s) the "*Person needing the resource*" in the process description (Figure 19). They are handling resource requests in big projects to help project managers. Figure 19 shows the new process and changes in responsibilities.

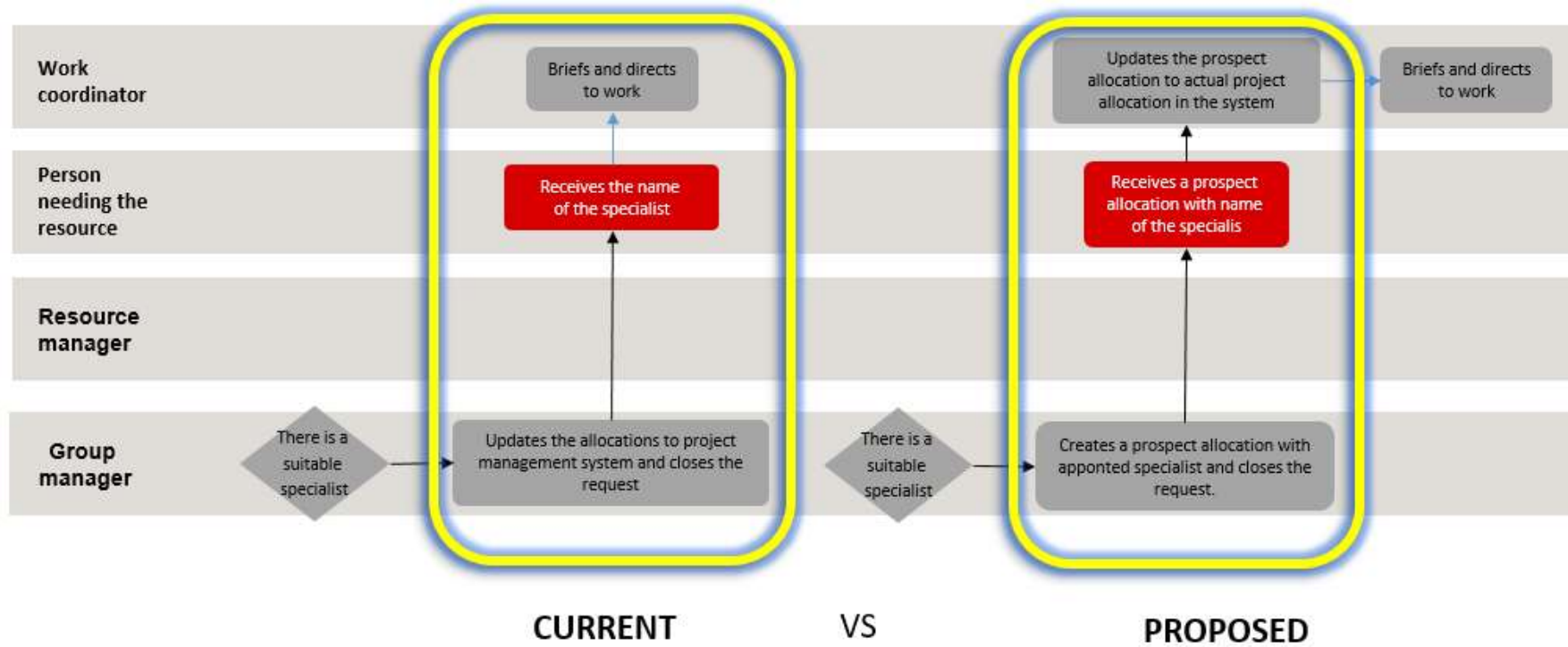


Figure 19. The initial proposal for the improved resourcing process.

Figure 19 shows the changes between current and the new alignment of responsibilities. Changes are highlighted within the box with a yellow outline.

Group managers, after finding the right specialist with the required free capacity will first create a prospect allocation for him. Currently, managers try to create allocations by guessing how the work will be conducted. The new way of creating prospect allocations enable managers to identify which allocations have been done by them and which have been fine-tuned by the persons directing the actual work.

When the prospect allocation is created it is then handed over to the PMO or the work coordinator. The responsibility of the PMO or the coordinator is to update the prospect allocation of a specialist to an actual project allocation, which in turn is in line with the scheduled work efforts and project phases.

The above idea was debated during the co-creation workshop and the idea came from the constant number of projects in process. There was a discussion that people participating in the workshop cannot influence the number of projects, but the allocation practices and how we are using them is in our area of control; thus the idea of changing the responsibilities in the process.

These changes are expected to decrease the gap that was measured during the CSA phase which showed that only 65% of the actual work is allocated. By using the new process and responsibilities the accuracy of allocations will increase and also the changes in the projects' plan and scope are also handled in a way that updates the coming months' estimations. Figure 20 shows the allocation creation form.

Figure 20. Allocation creation form.

Figure 20 shows the “Is prospect” box that has been taken in use by the new process. This is used when a new allocation is created. Group manager ticks the box when the prospect allocation is created. When the project responsible edits the allocation and changes it to an actual project allocation the tick is taken away and it is then visible to all that it has been updated.

When the estimation accuracy of allocations is increased, reporting becomes more trustworthy and deviations can be handled more accurately. This will also unify the project management practices in the organization when project managers use the system the same way and scrap their own Excels or Notepad lists.

5.4 Increasing Control with Balanced Scorecard

The second improvement to the resourcing process is introducing new monitoring practices. Balanced Score Card was chosen based on the familiarity and the multidimensional approach of monitoring it represents.

*“Balanced Scorecard has been used before, but it is not in use currently”
(Co-creation workshop DD)*

There was previous experience with BSC among participants and they had already positive attitude towards it. This will ease the implementation phase for the new monitoring practices.

Emphasis on the automation of measurements was highlighted. The newly created measurements need to be done in a way that managers do not need to cut and paste figures between systems. Rather, the monitoring tool should pull all the necessary information from the original data sources and combine them in the monitoring tool.

Since the objective is to enhance the resourcing process’ measurements the internal business process area gains the most focus while the other areas. Customers, Finance, and Learning and growth, though being important, get less attention since they are more focused on the unit’s overall performance and are there to prevent partial optimization.

During the co-creation workshop metrics were discussed and noted to the field notes. They are presented in Figure 21 by areas of the BSC.

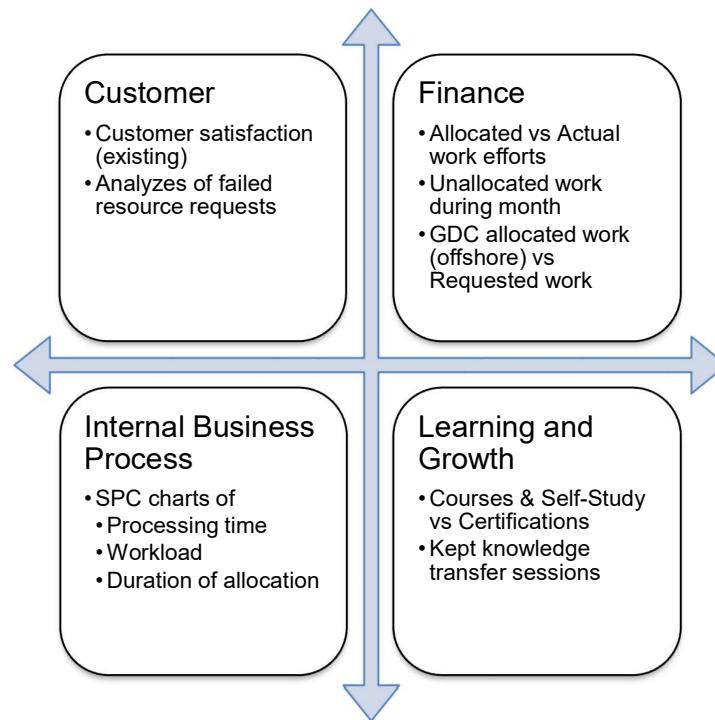


Figure 21. Balance Scorecard for measuring unit's performance of resourcing.

Figure 21 shows the BSC and metrics that were discussed during the co-creation workshop. The suggestion is that the measurements and analysis are stored in the managerial SharePoint site where all managers already have the needed access. There is a capability to create the needed tables and lists with the detailed information of the measurements. That site is also capable of holding further analysis and documented actions of those occurrences that need further actions caused by going over or under the preset threshold limits.

5.4.1 Internal Business Process Metrics

The lean way of measuring process efficiency with Statistical Process Control (SPC) metering was thought to be good. With this metric requests with processing time exceeding the upper control limit is analyzed and documented in more detail.

“It is true that at the moment this kind of analyzing has not been done. Currently, requests are measured only by how many requests out of all are closed in agreed time frame, but the content has not been analyzed further”
(Co-creation workshop SDC)

In this metric all requests that trigger the upper control limit (UCL) are analyzed and documented. And these analyses are expected to result in improved actions preventing anomalies from happening again. These actions can be discussed with the requester if there are quality issues with the request itself, or result in input to a training plan to grow more specialist if there is a lack of skilled specialists in that area and so forth, to give examples of the use of SPC.

SPC was created by taking historical request data that the unit has handled during the last four months starting from 1st of Dec 2016. This was chosen for the baseline data since the fiscal year of the case company ends at 31nd of March, so this is one of the most active parts of the year regarding a number of opened requests. The chart is shown in Figure 22.

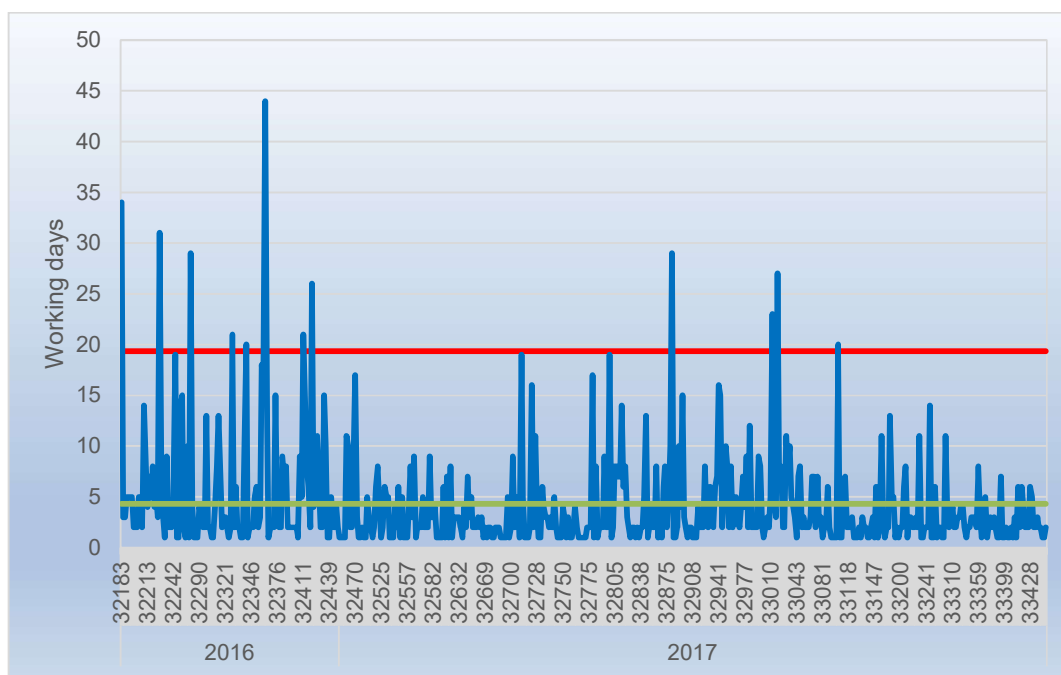


Figure 22. SPC Request handling times.

Figure 22 shows the new measurement created to analyze the successfully closed re-sourcing requests. With this measurement, the process is easily monitored and the tickets that need more analyzing are easily identified from the table. From the chart, it is visible that there are four requests of 2017 that need more analyzing.

This chart is done by calculating the process time of each request. Vertically on the left, we have the process measurement in working days. Then the average is calculated from

the process time from all requests; this gives the green line to the chart. The company resourcing process description states that the service level promise is 5 working days and the average of the past four months has been 4,3. Then the upper (UCL) and lower control limit (LCL) is calculated.

$$UCL = [average\ processing\ time] + 2,659 * [standard\ deviation\ of\ processing\ time]$$

$$LCL = [average\ processing\ time] - 2,659 * [standard\ deviation\ of\ processing\ time]$$

Since the processing time cannot be negative the LCL is set 0 and thus not examined.

Control limits are set to the third multiple of standard deviation because this way of analyzing the process is new to the case company and it already gives a set of requests to analyze and start corrective actions. When time passes and the improvements lessen the number of crossing the limits these can be set to tighter level.

The second measurement is about how much workload is requested in the resourcing request. This chart is shown in Figure 23.

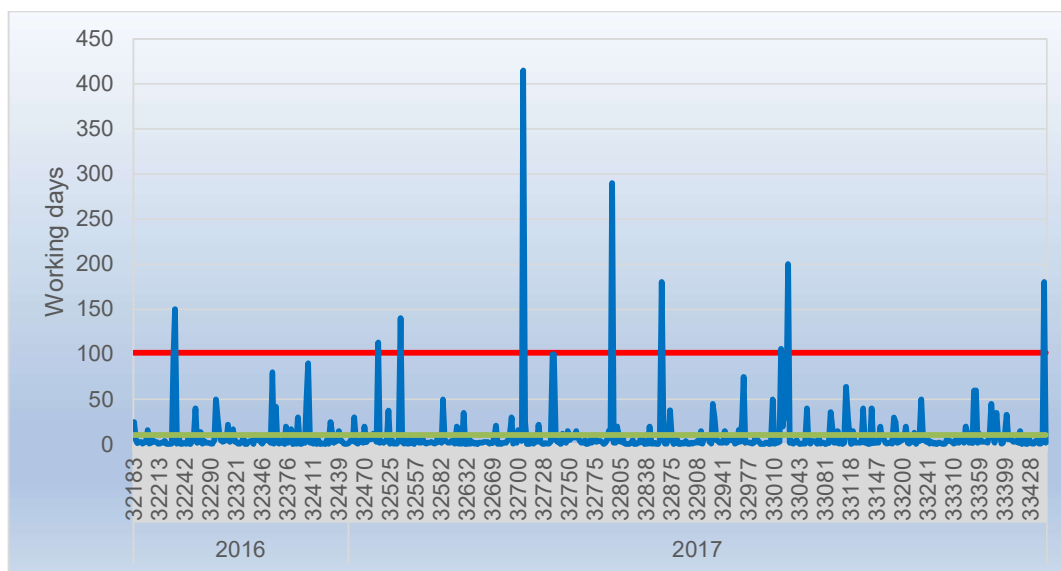


Figure 23. SPC of requested workloads.

Figure 23 shows the deviation of the requests during the last four months. The average workload in the requests is 10.5 working days. This can be considered quite low as such, but the volume of requests tells that there are many tasks going on and overlapping at the same time.

Third measurement in internal process metrics is the duration of tasks that are requested in the resourcing requests. This is a number of working days between the start and the end date of the requested task. This measurement is shown in Figure 24.

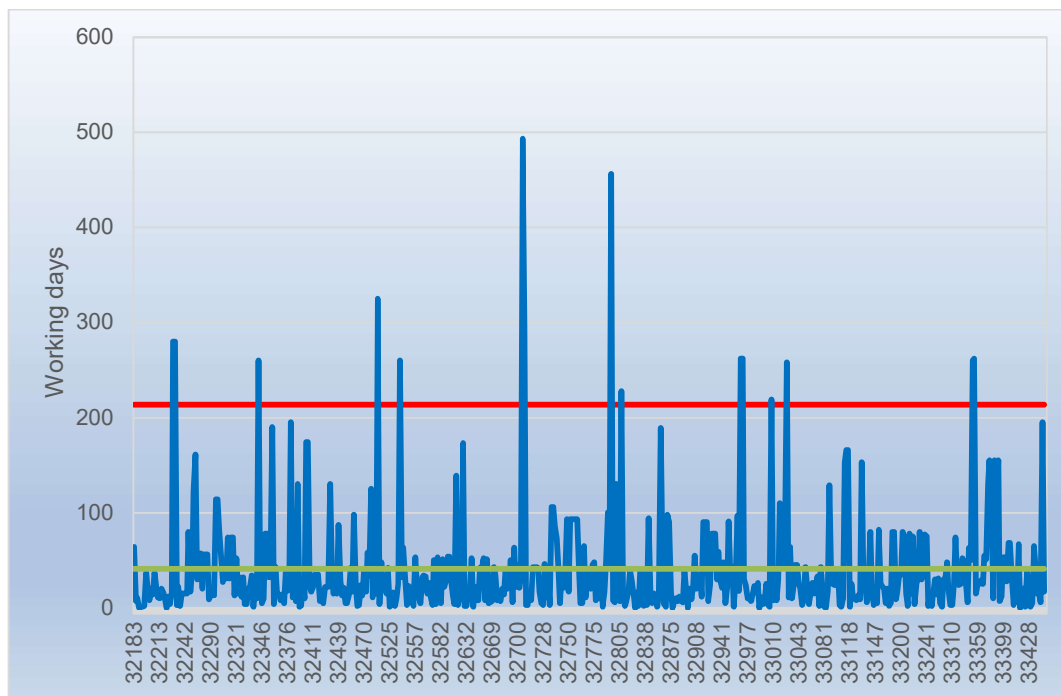


Figure 24. SPC of requested durations.

Figure 24 shows the deviation of task durations in the resourcing requests during the past four months. The average is 41 working days. There are few requests that are spanning the work for over a period of one year. These kinds of requests still seem to be quite rare.

These measurements enable the case company to analyze the customer demand by following the workloads and task durations. When this is combined with the processing time it gives the capability to identify technical areas where there is a lack of specialists. This information is important when the training programs are planned and specialists' skill sets are examined. These measurements are visualized in Figure 25.

Internal Business Process

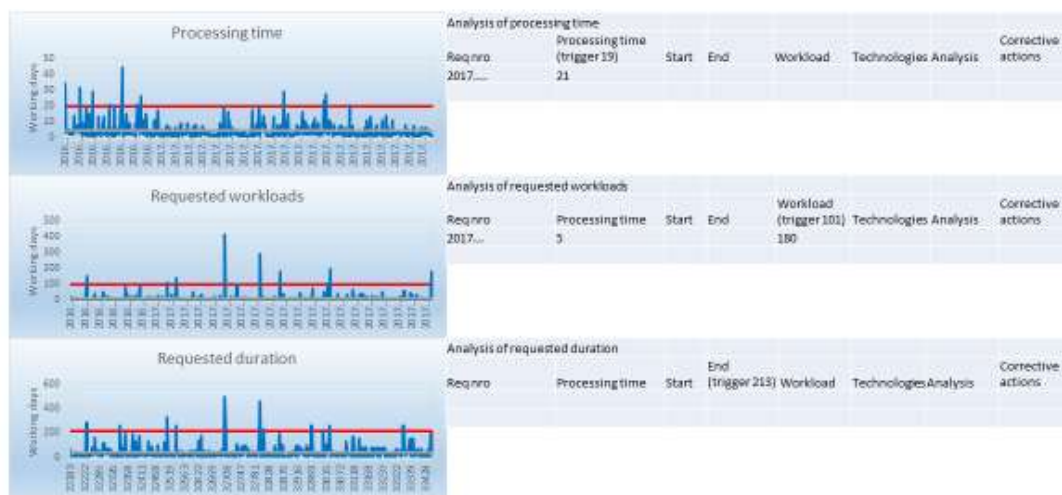


Figure 25. Internal Business Process dimension.

Figure 25 shows the layout of the internal business process dimension. This gives a quick snapshot of the current state in this particular dimension of BSC.

5.4.2 Learning and Growth Metrics

The second part of the Balanced Scorecard is the learning and growth metrics. This is identified as an important area to track since the solutions in projects and environments that are provided as a service are changing rapidly. All specialists need to train and learn new skills constantly.

“In the future, it is not enough that you are skilled in one specialty.” (Co-creation workshop SD)

During the workshop, it was discussed that learning capacity of the organization should be measured somehow. The identified bottlenecks in the resourcing process feed the learning plan that groups need to follow to meet the needs of demand.

“There are identified bottlenecks in the workstation area. All specialists are fully booked” (Co-creation workshop SDC)

When bottlenecks are identified they should be followed up and put to the training plan as training requests. Training requests can then be morphed into training assignments for specialists that still do not have an agreed skill development path or who already have fitting paths in place. Also, internal knowledge transfer sessions can be organized to widen the skills of specialists.

Two metrics were thought as measures for the success and growth in skill development. First one was the hours used in training and self-study divided with the number of successful certifications. Certifications are needed by the company to document and prove the skills of its employees to current and future customers. These are also important to get higher level or partnership deals from the software providers, for example, the Microsoft partner network.

Another metric is to measure the amount of held knowledge transfer sessions divided by the corresponding training requests. With this measurement, the case company can ensure and follow that the internal specialist pools are adequately utilized to broaden the skills base of specialist employees. This is a cost effective way to deliver focused training in areas where more flexibility in resourcing is needed. These measurements are visualized in Figure 26.

Learning and Growth

| • Courses & Self-Study vs Certifications | | | |
|--|----------------------|-------------------------|-------------------------------|
| Name | Courses & self-study | Acquired certifications | h/certification (target 37,5) |
| Specialist A | 27 | 1 | 27,0 |
| Specialist B | 200 | 3 | 66,7 |
| Specialist C | 30 | 0 | Na |
| Specialist N | 0 | 0 | Na |

| • Kept knowledge transfer sessions | |
|------------------------------------|----------------------|
| Name | Sessions Target 5 |
| Specialist A | 1 |
| Specialist B | 0 |
| Specialist C | 5 |
| Specialist N | 3 |

Figure 26. Learning and Growth dimension.

Figure 26 shows the layout of the learning and growth dimension. This particular figure gives a clear picture of development efforts and performance of the specialists training and self-study.

5.4.3 Financial Metrics

Three metrics for the financial sector in Balanced Scorecard were thought and discussed. First of these was how much of the actual work deviates from allocations in respect of reported hours and schedule. The second metric studied how much unallocated work was done during a given month. The third and last one measures how much of the requested workloads can be allocated to Global Delivery Centers (GDC) as off-shore work.

Measuring the deviations of allocated and actually reported work gives the case company a sense of its ability to accurately estimate the work efforts and scheduling that is necessary to deliver the promised deliverables as agreed with the customers. This is an important factor when new contracts are done and the pricing is calculated.

Having access to information covering how much of the work reported had no allocation whatsoever attached to it allows one to see the effectiveness of the resourcing process and is also related to the previous measurement. From the current state analysis, it came apparent that some of the work does not come through the resourcing process at all. This hidden workload greatly hinders the allocation process when specialists have in the real world more work than the allocations show as if there would be less work being done on than there actually is.

This situation is harmful in many ways. There is a possibility that the specialists become over-assigned and things get done poorly or behind the scheduled timelines. It also gives the false impression that there are insufficiently utilized specialists because the allocations of individual specialists show less than 100% of possible allocated hours.

In the worst case scenario, the above means that when a company believes to be streamlining its performance by getting rid of unnecessary fat, it, in fact, burns away some of its much-needed muscle and becomes less able to perform instead.

Last of the measurements is a strategic one. Significantly increased usage of Global Delivery Centers is decided by the case company as a strategic choice. Success in this area can be measured by the percent of the work requested that is allocated to offshore specialists. Another measurement on this is how strong utilization percent the offshore specialists have. Combining these two measurements can, from the resourcing perspective, reveal if there is need to grow off-shore capabilities to meet actual demand. These factors are visualized Figure 27.

Finance

| • Allocated vs Actual work efforts | | | |
|------------------------------------|--------------|-------------------|---------------|
| Project ID | Name | Allocation (h[€]) | Actual (WD) |
| Project 001 | Specialist A | 10 [5 625 €] | 15 [8 438 €] |
| | Specialist B | 9 [5 063 €] | 10 [5 625 €] |
| | Specialist N | 10 [5 625 €] | 8 [4 500 €] |
| Project 002 | Specialist A | 15 [8 438 €] | 25 [14 063 €] |
| | Specialist C | 21 [11 813 €] | 15 [8 438 €] |

| • Unallocated work during month | |
|---------------------------------|----------------------------|
| Name | Amount of unallocated work |
| Specialist A | 15 [8 438 €] |
| Specialist B | 1 [563 €] |
| Specialist C | 0 |
| Specialist N | 0 |

| • GDC allocated work (offshore) vs Requested work | | |
|---|----------------------|---------------------|
| Requested work effort (WD) | GDC allocations (WD) | Ration (Target 40%) |
| 950 | 100 | 11 % |

Figure 27. Finance dimension.

Figure 27 shows the layout of the finance dimension. This dimension gives visibility to the accuracy of allocations and actual hours as well as the amount of unallocated work. Also, the offshoring ration is shown here.

5.4.4 Customer Metrics

The consensus in the workshop was to keep customer satisfaction measuring as it is currently. There are two ongoing measurement methods, both continuous processes that are used throughout the year.

First one of the metrics is automatic. Every resourcing request will have one feedback survey sent to the requesting person, these are the case company employees, at the

time of the scheduled end day of the task. It covers three areas of specialist work: professional skills, the preciseness of work and collaboration skills. All the areas have questions with a scale of one to five, five being the best.

The second survey has the same questions but there is another dimension of importance. All questions are rated on the factors of success and importance. This way the weight of the answer also changes and appropriate measures can be taken, keeping the focus on the results that are rated as important by the respondent. This survey is sent to both internal and external respondents and is currently handled by the group managers manually. These factors are visualized Figure 28.

Customer

Customer satisfaction (Target 4.2)



Figure 28. Customer dimension.

Figure 28 shows the layout of the customer dimension. This gives a picture of the case company performance from the customer perspective.

Next section is about the validation of these proposed changes. During the validation, this proposal is fine-tuned according to the feedback received with the aim to better fit the needs of the case company.

6 Validation of the Proposal

This section discusses the results of validation done for the initial proposal. It is done by presenting the proposal to key stakeholders of the case company for evaluation and feedback resulting with either issue that needed changes or ratification of the proposal. At the end of the validation process, the final proposal for improving allocation accuracy is formulated.

6.1 Overview of the Validation Phase

Validation was a workshop with stakeholders including persons with power to authorize the start of the implementation of the proposal, should they so choose to do. This included the Head of ITST. Also, the Head of PMO was invited because the initial proposal has implications on the work of the PMO. Key persons from the development of the initial proposal were also invited to join the meeting to ensure that all upcoming questions regarding the proposal could be answered. Because of unforeseen circumstances, the Head of PMO was not able to join the workshop, but it was decided by the Head of ITST that the proposal and the decisions would be introduced to her after the workshop. General input for the elements of the initial proposal are shown in Figure 29.

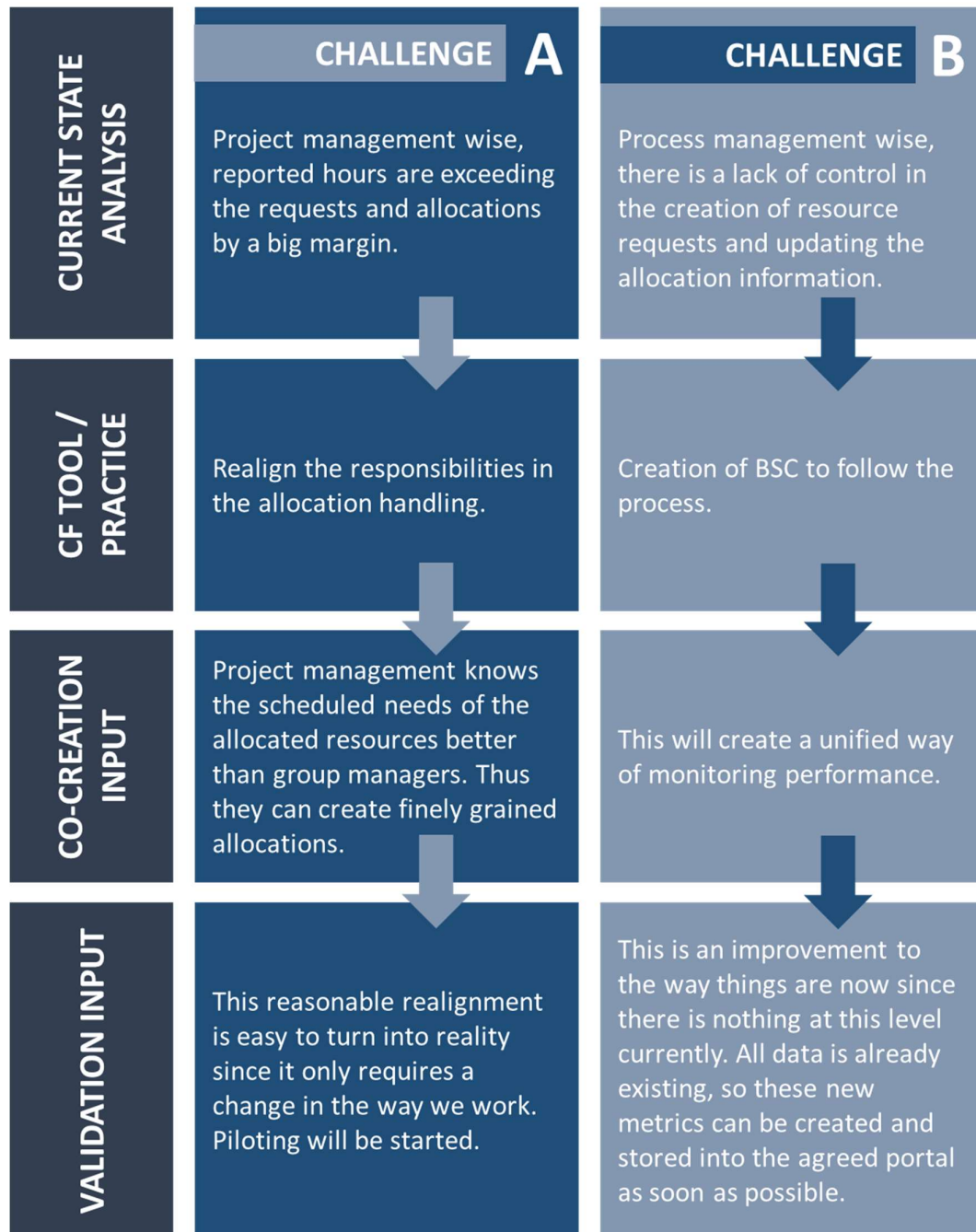


Figure 29. Validation input to the final proposal.

Figure 29 shows validation input to the proposed changes and the aimed effects. These are utilized to revise the initial proposal to create the final proposal. This will ensure the good fit and the feasibility to implement it in practice.

6.2 Evaluation of the Initial Proposal Based on Validation Workshop

Firstly, the findings of the CSA were discussed to gain the context and then the reviewed literature that was used to create the initial proposal was presented. The initial proposal was introduced and discussed to give a good understanding of what is to be changed and what new is proposed. At the end of the workshop, after all, questions were answered, the decision was made to pilot the proposed solution.

6.2.1 Validating the Responsibility Changes in the Resourcing Process

The responsibility changes in the initial proposal were introduced to the workshop. At the beginning, it was clarified that these allocations are handled inside the C7 system. Then the difference between the current and the new approach was explained. During a discussion concerning the new process of the project responsible updating the allocation to reflect real expectations of the work, there was an exchange of comments:

“Do they not really update the allocations” (Validation workshop V1)

“There is only a couple of project managers who update those allocations. It is rarely the case that anyone changes these” (Validation workshop V3)

“Can specialists update their own allocations?” (Validation workshop V1)

“They cannot, but it would be good if they could” (Validation workshop V3)

It was also covered that to implement this

“We only need to change the way we work and no system changes are required at this stage”. (Validation workshop F1)

Another question regarding the proposal was raised: the proposal does not solve the issue that if two projects create an overlapping allocation the system does not sound any alerts. It just shows the expected utilization to be over 100%. This is something that the managers are already following and it was not considered a major issue. The same situation is already present with the current way of working.

The fact that requests are opened by many organizations was identified. The question was how these allocations would be handled if the request was opened by someone else than a project manager. It was decided that the work coordinator will be responsible for

updating the allocation, so the instructions for this would be sent along the information that the prospect allocation is created.

There was a discussion of what is done to people do not change the way they use the resourcing process. This issue can be handled with the fact that prospect allocation can be monitored so those allocations that are not updated will show on the monitoring and allocation table. This way it can be followed who is not complying with the change and more actions can be taken to correct the state of affairs.

“This prescription will be swallowed more easily if we first pilot this with a group and then implement this agreed way of working to our own practice.”
(*Validation workshop V1*)

To implement this process proposal, the decision was made to start to pilot this first and then, based on the experience gained, implement it across the organization. A pilot group was selected to include one project manager and two persons from the project management office. The Head of PMO also agreed to this and was happy to see this change coming to wider use.

6.2.2 Validating the Introduced Balanced Scorecard

Balanced scorecard was introduced and the content of it. All four areas (Customer, Finance, Internal Business Process, and Learning and Growth) were covered and discussed.

The internal Business process was the first aspect that was discussed. It was clarified how the SPC metrics are calculated for process time, Workloads and Scheduled durations. It was pointed out that the gap between average and upper control limit is pretty wide. It was explained that this is the initial UCL that is based on the third multiple of standard deviation and this is because the method is new and there is a lot of deviation in the data.

The source of the data was also discussed. Data can be fetched from the business intelligence system or resourcing table directly. This was to ensure that the measurements do not reside in anyone's personal computer.

“I just meant that this does not reside in anyone’s c-drive, but instead it can be inserted to MSBI as a report where anyone can look it up.” (*Validation workshop V1*)

Analyses were agreed to be stored in the new organization management portal where anyone can look them up and document the outcomes.

“My mind is already tingling with the image of me being able to explain to the UK people what this is all about...” (*Validation workshop V1*)

Other measurements were covered in a bundle. The current way of collecting customer feedback was accepted since no change was proposed. Also proposed new Growth and Learning measurements were accepted without changes.

Financial metrics ignited more discussion about the changes in the amounts of estimated work efforts during sales and planning phases, and the actual hours reported. It was realized that if the allocations are done according to the sales estimates, these metrics will show if there are more reported hours than was planned. This is good when the project is fixed priced and the success of the estimates are reviewed.

During the revision of metrics in financial dimension, the Head of ITST requested that the requested amount of work is also measured and analyzed when the allocations and reported hours are compared. This addition was implemented and is show in the final version of that dimension Figure 30.

Finance

| • Allocated vs Actual work efforts | | | | |
|------------------------------------|--------------|---------------|-----------------|---------------|
| Project ID | Name | Request (WD) | Allocation (WD) | Actual (WD) |
| Project 001 | Specialist A | 10 [5 625 €] | 10 [5 625 €] | 15 [8 438 €] |
| | Specialist B | 8 [4 500 €] | 9 [5 063 €] | 10 [5 625 €] |
| | Specialist N | NA | 10 [5 625 €] | 8 [4 500 €] |
| Project 002 | Specialist A | 10 [5 625 €] | 15 [8 438 €] | 25 [14 063 €] |
| | Specialist C | 20 [11 250 €] | 21 [11 813 €] | 15 [8 438 €] |

| • Unallocated work during month | |
|---------------------------------|----------------------------|
| Name | Amount of unallocated work |
| Specialist A | 15 [8 438 €] |
| Specialist B | 1 [563 €] |
| Specialist C | 0 |
| Specialist N | 0 |

| • GDC allocated work (offshore) vs Requested work | | |
|---|----------------------|---------------------|
| Requested work effort (WD) | GDC allocations (WD) | Ration (Target 40%) |
| 950 | 100 | 11 % |

Figure 30. Revised financial dimension of BSC.

Figure 30 shows the added measurement “Request (WD)” that was requested. With this measurement, the case company can easily identify specialist work that are missing requests. This way the allocating managers can contact the project responsible and initiate corrective actions.

6.3 Summary of the Final Proposal

The initial proposal was validated during this phase of the study. It was the last part of the study’s field work and included facilitating a validation workshop at the case company the collected data represent Data 3 from research design.

Validation was done to ensure the relevance of the proposal and fit for the case company. The initial proposal was considered to be valid as the final proposal with small addition to the financial dimension of BSC.

Final proposal consists two major changes. First one (A) is the realignment of the allocation responsibilities during allocation handling. In this new way of working managers are creating allocations as prospects to highlight the fact that these are not yet fine-tuned in the way of real needs of the project. Work coordinator is responsible of the allocation fine-tuning and changing the status of the prospect allocation to an actual allocation. This increases the accuracy of the allocations. Final proposal for the resourcing process flowchart is shown in Figure 31.

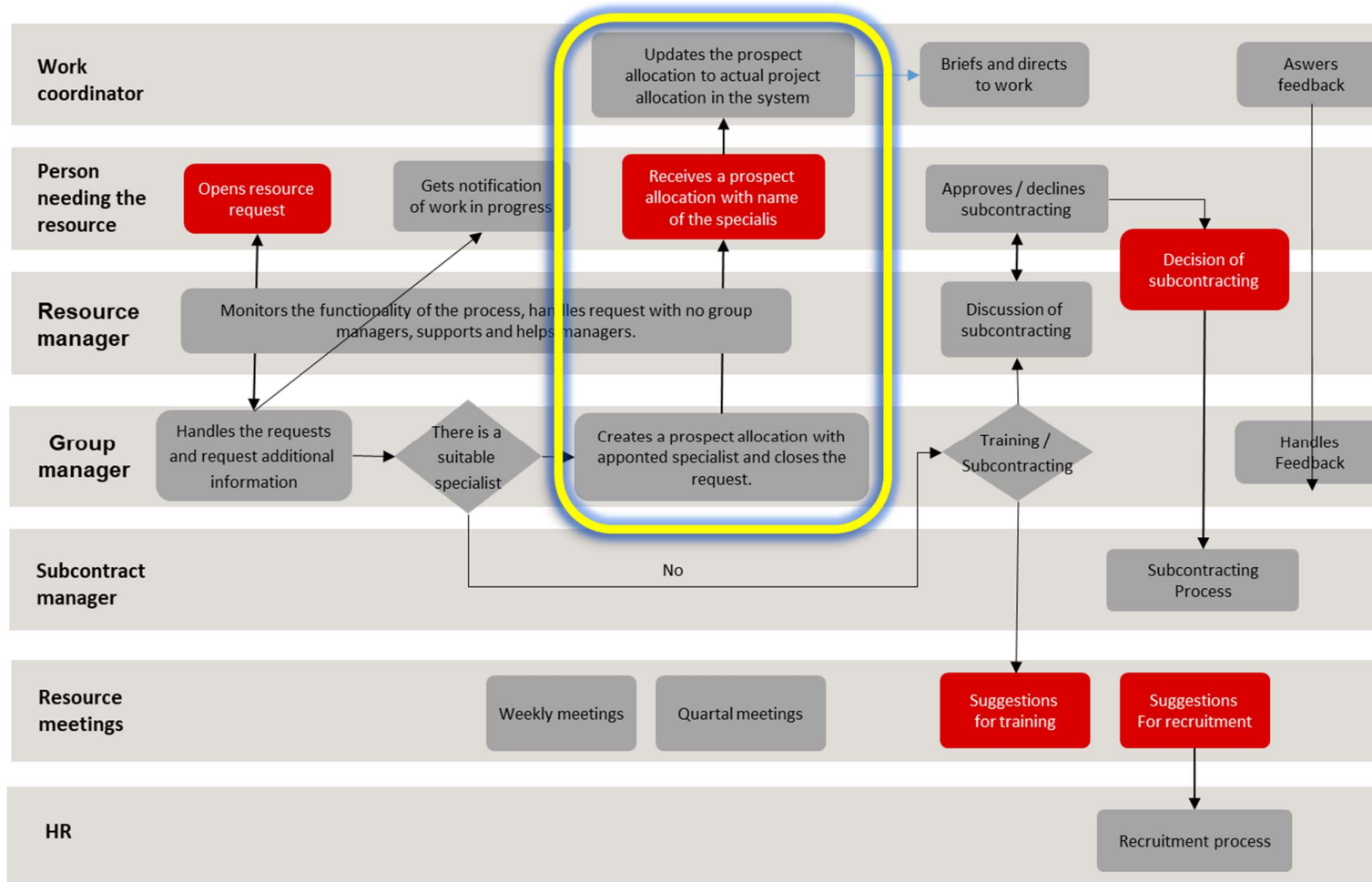


Figure 31 Final proposal for the resourcing process flowchart.

Figure 31 shows the changed parts in the resourcing process highlighted within the box with a yellow outline.

Second one (B) is the introduction of balanced scorecard. This is introduced to create more control and visibility to the resourcing process. With this, the deviations in the process are easily and quickly identified and needed actions can be initiated shortly to prevent escalations. The final proposal is shown in Figure 32.

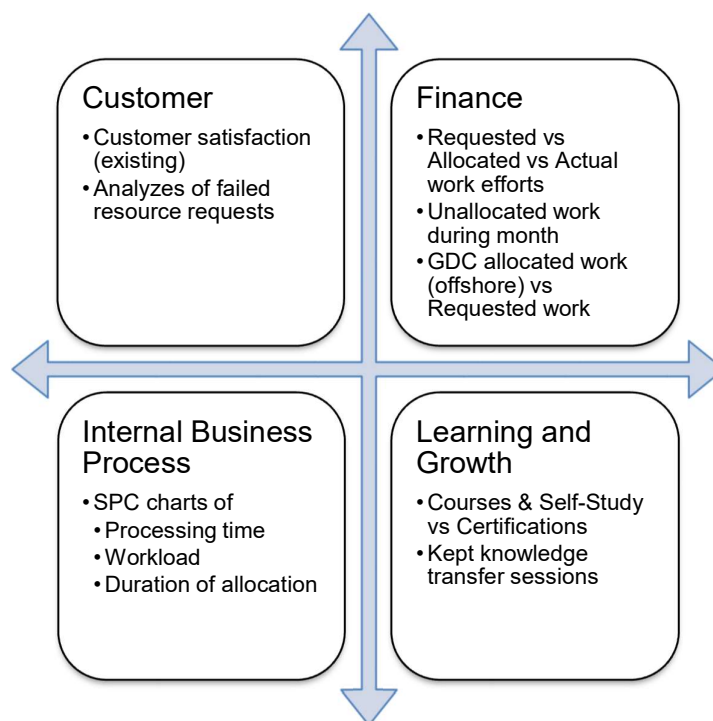


Figure 32. Final proposal for BSC.

Figure 32 shows the content of the balanced scorecard. The more detailed content of each dimension is described in the section 5.4. During the validation, there was an addition to the finance dimension that is covered in 6.2.2.

The decision was made to start piloting the new way of allocation handling and then expanding the use of it. Balanced scorecard's internal business process metrics was

decided to be implemented immediately and the reports should be stored in MSBI and the analysis of the triggered measurements to be stored in the unit's management site along with the other three metric areas.

Figure 33 shows the final proposal that was validated.

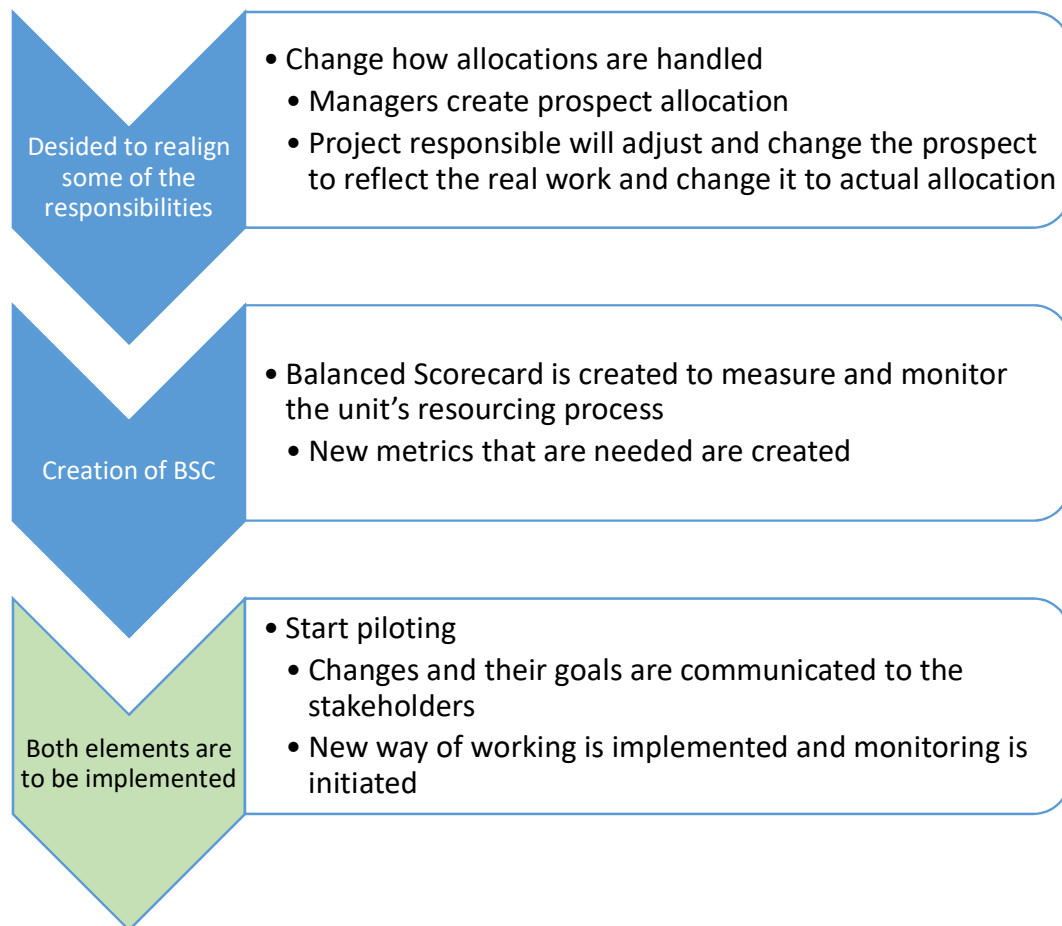


Figure 33. The final proposal for improving allocation accuracy in the case company.

Figure 33 shows the steps that were validated and the decision to start piloting the changes that are proposed.

7 Conclusions

This section summarizes the findings from the Thesis. After this, the recommendations follow with suggestions for further actions. Finally, this section ends with the evaluation of the quality of the work in this Thesis.

7.1 Summary

The objective of this study was to improve the existing model of strategic resourcing to enable the measured and tracked allocations of HR within the resourcing process at the case unit. The case company is a global ICT service provider. This study was located in the Finnish organizational unit that produces project work for the case company customers.

Business challenge in this study was that the current resourcing process was not used in a systematic way and the work tasks got requested and accepted without using the official resourcing process. Additionally, the current work requests and allocations did not correspond to the reported hours. This created inefficiency when deciding allocations and uneven distribution of workloads, and resulted in a gap with the allocated and reported work that needs a solution to effectively use the resourcing process.

This study was conducted in seven major stages. Firstly, the problem was identified together with the case company. Then, the actual study was designed, which was followed by the current state analysis. Initially, the current state analysis was conducted to verify the relevance of the problem and the extent of needed actions. CSA focused on two areas: usage of the resourcing process and its difficulties, and reasons why there is unallocated work. It was found that the resourcing process is well known to employees who are expected to use it, but there is, process management wise, lack of control in using it. There was also ignorance in the ways to follow the agreed resource allocations and their importance. It was found out that, project management wise, only 50% of the reported work effort is requested through the resourcing process. It points to the need to change the resourcing process and, in particular, increase monitoring methods to solve the problem of unreported work. There was also comments in the surveys that there is a shortfall of sufficiently widely skilled specialists.

To approach the problem, literature search was conducted focusing on two areas, business process management, and multi-project management. The business process management concentrated on improving the process control and its monitoring. The multi-project management explored the resource allocation and its monitoring. Lean process management and balanced scorecard were found to give good guidance for measuring and tracking the specialist workers agreed allocations, while PRICE2™ product delivery management brings the good practice to increase the accuracy of those allocations to better reflect the goings-on of the real world.

Based on the results of the current state analysis and the findings from available knowledge and best practice, the proposal was drafted to increase the accuracy and tractability of the allocations. The proposed solution come in two parts: first, the division of the responsibilities for the resourcing process, and second, the introduction of elements of the balanced scorecard to the resourcing process. The proposed solution was to split the allocation process between the group manager and work coordinator. The benefit is that the work coordinator knows the weighting of the work and fine details of scheduling. These two proposed improvements, taken together, will add visibility to the allocation and reflect the actual stages of the project.

In the new process allocations created by the group managers are marked as prospect allocations. This is due to the fact that group managers do not know the phasing of the project and are thus unable to create more sophisticated weighting in the allocations. Their ability is limited to make a constant planar allocation. This is then transferred to the employees responsible for directing the actual work. Their responsibility is to fine-tune the weighting of the work efforts to reflect the actual needs of the project and change the prospect to an actual allocation. This fine tuning was missing previously and resulted in inaccurate allocation forecasts.

The second part of the proposal relates to the introduction of the balanced scorecard to the allocation part of the resourcing process. The balanced scorecard is proposed with the purpose to enhance the capabilities to monitor the allocation part of the process and spot deviations in the whole process. This can be achieved by implementing new statistical process control monitoring and conducting a thorough analysis of requests that trigger the control limits. Then, based on the triggered process analysis, appropriate development tasks could be initiated.

This proposal was presented to the case company stakeholders who are in the position to decide on the implementation of the proposal. Their review resulted in the decision to start piloting this proposal.

The outcome of this thesis and contribution for the company is a strategic resourcing process that has responsibilities more in line with the knowledge that exists within the process with more refined capabilities to monitor and analyze deviations that are prone to happen because of the presence of human interaction in the process.

7.2 Toward Implementation of the Proposal and Future Recommendations

Next step in the case company is the piloting of handling the allocations to gain actual insight about effects in the quality of allocations regarding reported versus allocated hours and how well the allocated schedules hold. This has been agreed to be implemented, but sustained change will need future attention and support from the higher management to allow the proposed change to successfully become a routine way of work. Initial scheduling for the implementation is presented in Figure 34.

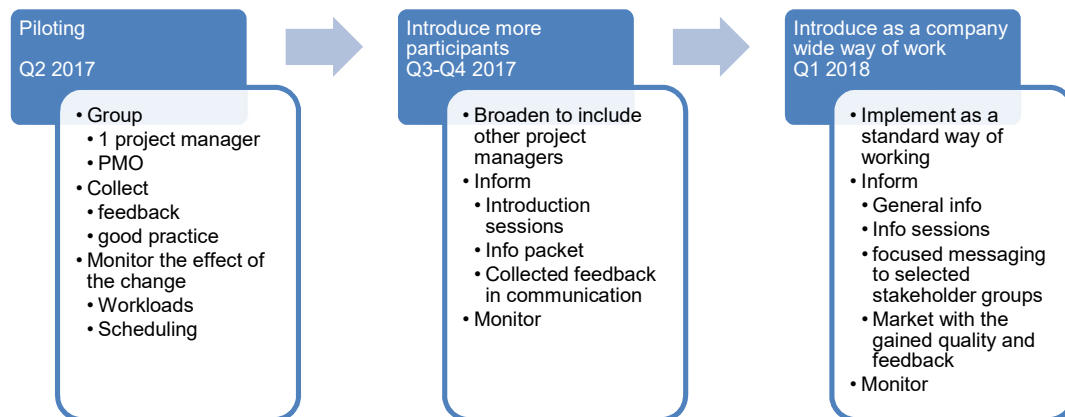


Figure 34. Initial scheduling.

Figure 34 shows a suggested schedule of implementation highlighting the importance of constant communication and monitoring. Checking that the new way of working is truly implemented is important to avoid slipping to old practices and also verifying the level of

commitment. Communication is important to tell the stakeholders why this is done and, to share gains, success stories and good feedback to endorse the use of the process.

This proposal does not solve all the problems in this field. Future development work is needed in the case company still. One of the areas to follow is the control limits of the balanced scorecard. This is important to find a good level of control cases to initiate enough development tasks but also not to swamp the organization with too many of them.

Also at the end of the fiscal year, there should be a point where these metrics are reviewed to realign them according to future needs, keeping them in accordance with company strategy and vision while steering the unit to good performance and success.

Sufficient monitoring and persistent coaching are key to implement this proposal and gain a more accurate resourcing process. Also, when development is done in the future, focus on the ease of use should be kept as a high priority.

7.3 Thesis Evaluation

The quality of this study is evaluated by criteria of relevance, validity and reliability, and logic. These are measured by comparing how the original objective and the final outcome of the study has been met and all the criteria followed.

7.3.1 Relevance and Logic

In this thesis, the study was designed to be conducted within the case company to ensure its relevance. The study started by defining the business challenge and objective of the work with the company. This was to ensure that the challenge was real and worth solving. This was then confirmed by the current state analysis to validate the problem and focus the proposal building to the right direction. The quality of the initial proposal was achieved by using professionally respected knowledge sources and co-creation methods. To ensure the fit and applicability of the proposal it was validated in the case company by stakeholders with decision making powers.

As a final outcome, one can note with certainty that the problem was real and showed up clearly in the current state analysis. Also, the feedback from the validation workshop

showed that the proposal for solving the problem is considered by the stakeholders as applicable. If nothing else, then the decision to immediately start piloting the proposed solution validates the relevance of the initial layout of the study with flying colors.

In this study, the logic of the research process was obtained by describing the research design in detail and following the process throughout the sections. The design of this thesis was described to give an overview of the methods, data, and evaluation that was used in conducting this study. During the work of this study teaching and peer reviews of the material produced for each section were conducted to ensure that the logic was followed. This feedback along the way was used to bring the outcome closer at each gate and ensure the achievement of the outcome.

7.3.2 Validity and Reliability

In this study, validity and reliability were ensured by collecting data from multiple sources and using a mix of qualitative and quantitative data. These sources were presented in a detailed way in the research design to ensure that the traceability of the evidence is maintained. Traceability from analyses to the proposal was shown in the study by pointing out links between chapters and how they correlate. This was done to convince the reader and follow the reasoning from problem to solution and vice-versa.

Validity was upheld by interviewing stakeholders from many aspects of the process. Interviewees included employees who create the resourcing request, who are responsible for responding to the requests by allocating suitable specialists and also the specialist workers who then deliver the requested tasks according to the allocations. This way the process was examined from all aspects. This was further verified by conducting an online survey for the same groups of employees but with a much larger sample since it was impossible to individually interview all the involved employees. Both the interview tables and survey results are attached as appendixes.

The reliability was ensured by keeping field notes and recordings when doing fieldwork for later referencing and quotation in the study. Also, the structures of field notes and surveys are shown in the appendixes to enable the reader to see in more detail how the data was collected. Used quotations and figures are provided to show the evidence of collected data. Reliability is also maintained by providing the references of used material that has been collected to enable the reader to follow the sources.

By using the varied methods of data collection the question of validity and reliability can be seen to be addressed. This also lessens the biases of the author by utilizing more lenses to study the same problem since not all sources were of the same type. Mixing qualitative and quantitative research methods can be good when creating a case study from a process problem. Since the views of the users and stakeholders usually contain their own biases the support from more quantitative numbers that are from monitoring and reported actions can lessen that factor and give a more reliable and balanced view.

7.4 Closing Words

The functional distribution of human resources is crucial for successful companies. It is imperative to know how the capabilities are utilized to develop a business.

This thesis showed that albeit a problem seems to be noticed in many ways it is not known why it was not solved. Many of the participants knew that there is a process and what it entailed but still opted for, in their opinion, the easier solution of bypassing the process and using direct contacts instead.

There are still many aspects to solve in the control of the process and multi-project allocation practices in a ICT service context. The author's interests are out there to read future work on how to improve allocation efficiency in the constrained project environments.

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Interview Questions for Resource Process Usage Mapping

Research Interview (Discussion)

TOPIC: Resource process usage mapping (managers requesting or allocating resources)

Information about the informant (Respondent A[N])

Table 1

| | |
|---|-------------|
| Details | |
| <u>Name (code) of the informant</u> | |
| <u>Informant's position in the case company</u> | |
| <u>Informant's role in Resourcing process</u> | |
| <u>Date of the interview</u> | |
| <u>Duration of the interview</u> | |
| <u>Document</u> | Field notes |

Table 2

| | Topic(s) of the interview | QUESTIONS | FIELD NOTES |
|---|---|--|-------------|
| 1 | Background information | <p>How long have you been working in the case company?</p> <p>How often are you using resourcing process?</p> <p>In what role are you using resourcing process?</p> <p>Can you describe the resourcing process as you know it?</p> | |
| 2 | Overall performance of the resourcing process | <p>What is your overall feeling towards resourcing process?</p> <p>How are you using resourcing process?</p> | |

| | | | |
|---|---|--|--|
| | | <p>How is the resourcing process meeting your needs in getting specialist employees when needed?</p> <p>What do you consider to be the strengths and weaknesses in the process</p> | |
| 3 | Creation and handling of a resource request | <p>How often you open or handle a resource request?</p> <p>What kind of requests are you making or handling?</p> <p>How are you collecting the needed information to open or handle a request?</p> <p>How have the Agreed Service Levels (SLA) been met? (work in progress in two working days and core competence found in five working days)</p> | |
| 4 | Making changes to allocated resources | <p>For Resource Requestors</p> <p>Are you making change requests to already closed resource requests?</p> <ul style="list-style-type: none"> - If no, why? - If yes, what kind? <p>What are the most common reasons for change requests?</p> <p>What are the obstacles in the process when change requests are needed?</p> <p>For Resource Managers</p> <p>Does your team receive change requests for already allocated specialists?</p> <ul style="list-style-type: none"> - If no, why? - If yes, what kind? | |

| | | | |
|---|------------------------------------|---|--|
| | | <p>What are the most common reasons for change requests?</p> <p>What are the key areas where improvements would give the most effect?</p> | |
| 5 | Following the allocated re-sources | <p>How are you following the resource allocated?</p> <p>How are you following the reporting of the allocated specialists?</p> | |
| 6 | Improvement ideas | <p>What kind of changes would help you creating resource requests?</p> <p>What kind of changes would improve the schedule and workload changes in allocations?</p> <p>What kind of other improvements would you like to see done to resourcing process?</p> | |

Interview Questions for Resource Process Usage Mapping

Research Interview (Discussion)

TOPIC: Resource process usage mapping (Specialist's allocated)

Information about the informant (Respondent B[N])

Table 1

| | |
|---|-------------|
| Details | |
| <u>Name (code) of the informant</u> | |
| <u>Informant's position in the case company</u> | |
| <u>Informant's role in Resourcing process</u> | |
| <u>Date of the interview</u> | |
| <u>Duration of the interview</u> | |
| <u>Document</u> | Field notes |

Table 2

| | Topic(s) of the interview | QUESTIONS | FIELD NOTES |
|---|---------------------------|---|-------------|
| 1 | Background information | How long have you been working in the case company? Can you describe the resourcing process as you know it? | |
| 2 | Allocated tasks | How often are you following your allocations? What kind of tasks are you usually allocated to? How are schedule changes handled in your experience during allocations? How are workload changes handled in your experience during allocations? | |

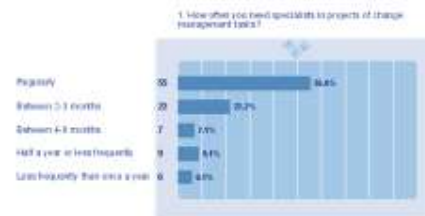
| | | | |
|---|-------------------|---|--|
| 3 | Unallocated tasks | <p>Do you receive task requests outside resourcing process?</p> <ul style="list-style-type: none">- If yes, how much of you daily workload are this kind of tasks?- If no, why? <p>Where do these requests come?</p> <p>What is your idea why they are not coming through the official resourcing process?</p> | |
| 4 | Improvement ideas | <p>What kind of changes would improve your understanding of currently allocated tasks for you?</p> <p>What kind of changes would improve the level allocated task versus unallocated?</p> <p>What kind of other improvements would you like to see done to resourcing process?</p> | |

Feedback survey for employees opening resource requests (1979-01-01 - 2017-03-01)

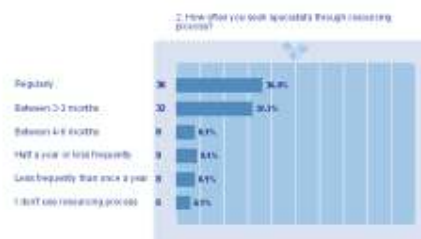
| Name | Participated | Answers | Completed |
|--------------------|--------------|---------|-----------|
| Total | 104 | 103 | 93 |
| Percent | 99% | | |
| Finished | 89.4% | | |
| Quit in the middle | 9.6% | | |
| Didn't respond | 1% | | |

Background information

1. How often you need specialists in projects or change management tasks? (99) (EOS: 0)



2. How often you seek specialists through resourcing process? (99) (EOS: 0)



3. How much work effort (working days) have you requested through resourcing table during past 3 months in total? (100) (EOS: 2)

3. How much work effort (working days) have you requested through resourcing table during past 3 months in total?



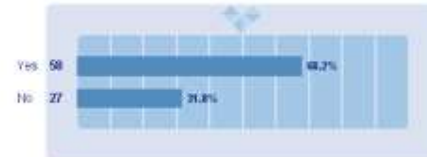
Practicality of resourcing process

1. How well is resourcing process supporting you when sourcing for specialists? (99) (EOS: 8)



2. Have you received specialist within agreed time frame? (94) (EOS: 9)

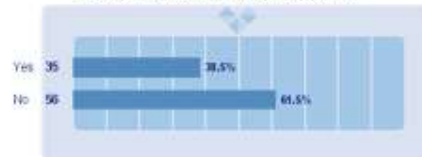
2. Have you received specialist within agreed time frame?



Deviant use of resourcing process

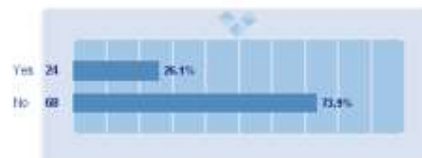
1. Have you created prospect resource requests? (91) (EOS: 0)

1. Have you created prospect resource requests?



2. Have you made change requests to already allocated specialist? (92) (EOS: 0)

2. Have you made change requests to already allocated specialist?

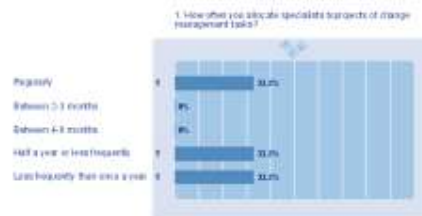


Feedback survey for allocating group managers

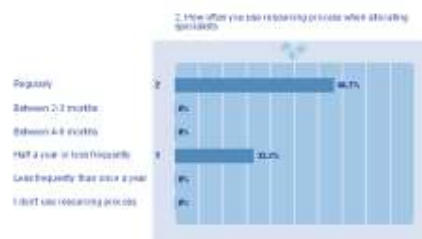
| Name | Participated | Answers | Completed |
|--------------------|--------------|---------|-----------|
| Total | 7 | 3 | 2 |
| Percent | 42.9% | | |
| Finished | 28.6% | | |
| Quit in the middle | 14.3% | | |
| Didn't respond | 57.1% | | |

Background information

1. How often you allocate specialists to projects or change management tasks? (3) (EOS: 0)

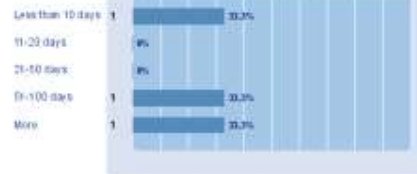


2. How often you use resourcing process when allocating specialists (3) (EOS: 0)



3. How much work effort (working days) have you allocated through resourcing table during past 3 months in total? (3) (EOS: 0)

3. How much work effort (working days) have you allocated through resourcing table during past 3 months in total? (3) (EOS: 0)



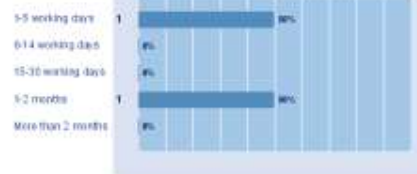
Practicality of resourcing process

1. How well is resourcing process supporting you when allocating specialists? (2) (EOS: 0)



2. How much lead time there usually is before the allocated work is to start? (2) (EOS: 0)

2. How much lead time there usually is before the allocated work is to start? (2) (EOS: 0)



Deviant use of resourcing process

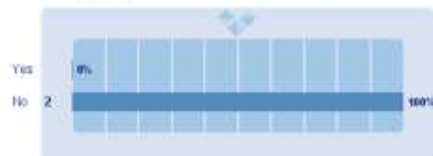
1. Have you received prospect resource requests? (2) (EOS: 0)

1. Have you received prospect resource requests? (2) (EOS: 0)



2. Have you received change requests to already allocated specialist? (2) (EOS: 0)

2. Have you received change requests to already allocated specialist? (2) (EOS: 0)



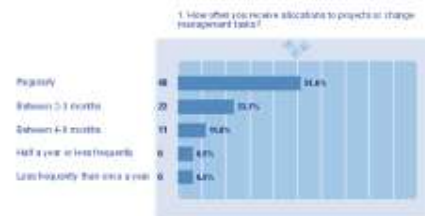
Feedback survey for allocated specialists (1979-01-01 - 2017-03-01)

| Name | Participated | Answers | Completed |
|---------|--------------|---------|-----------|
| Total | 96 | 96 | 82 |
| Percent | 100% | | |

| | |
|--------------------|-------|
| Finished | 85.4% |
| Quit in the middle | 14.6% |
| Didn't respond | 0% |

Background information

1. How often you receive allocations to projects or change management tasks? (B3) (EOS: 0)



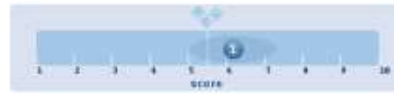
2. How much of you work is doing allocated tasks? (B8) (EOS: 0)

3. How much of you work is doing unallocated tasks? (B6) (EOS: 0)



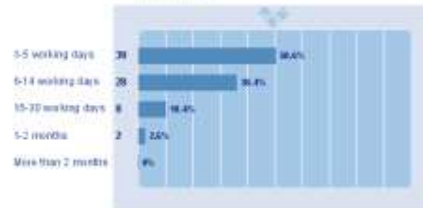
Practicality of resourcing process

1. How well is resourcing process supporting you when finding new tasks? (85) (EOS: 15)



2. How much lead time there usually is before the allocated work is to start? (81) (EOS: 4)

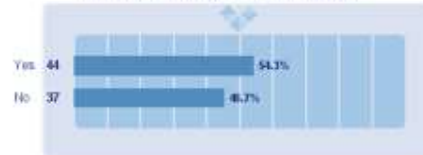
2. How much lead time there usually is before the allocated work is to start?



Deviant use of resourcing process

1. Have you received prospect resource requests? (81) (EOS: 0)

1. Have you received prospect resource requests?



2. Have you received change requests to already allocated specialist? (81) (EOS: 0)

2. Have you received change requests to already allocated specialist?



Validation Workshop Slides to Gather Feedback

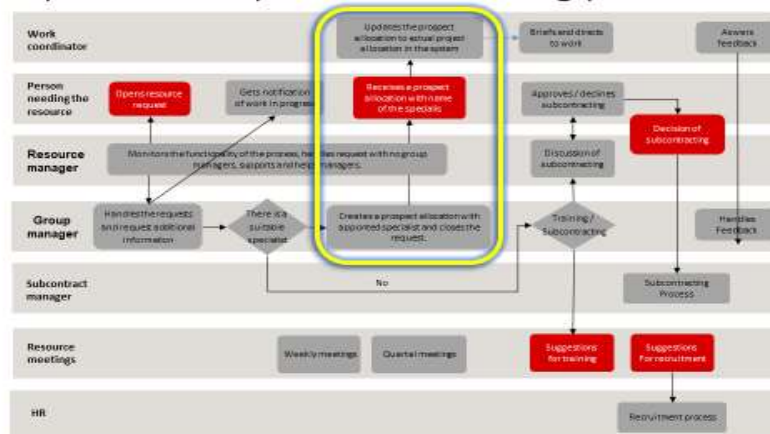
Gate 6 validation

- Presentation of the process
- Objectives
 - Feedback?
 - Any changes needed?
 - Does it fit?
- Next steps after Thesis

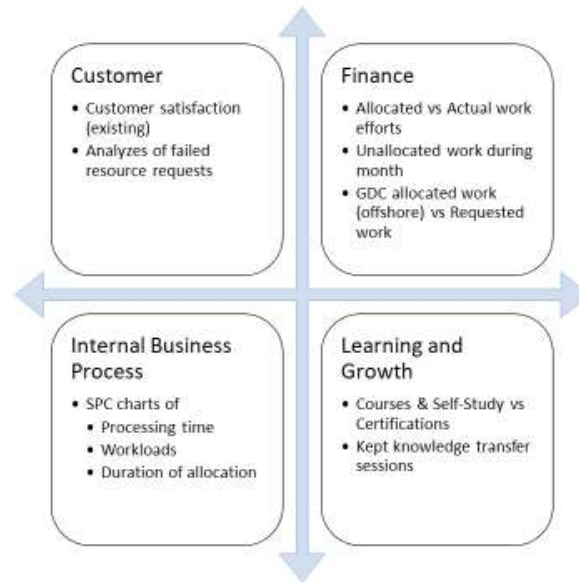
Gate 6 validation

- Feedback
 - Process Change
 - BSC and the metrics
- Any changes needed to the solution

Initial proposal for improved resourcing process

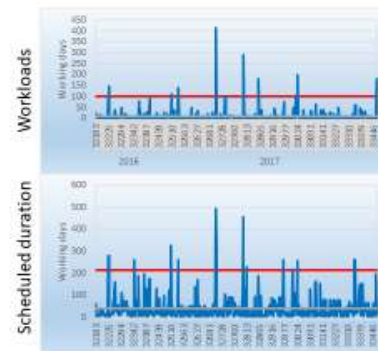


Balanced Scorecard



Internal Business Process

- Statistical process control
- Analyzis table
 - -> resource needs
 - -> skill needs



Other 3 areas

- **Learning and Growth**

- $\frac{[Self\ study]+[trainings]}{Certifications}$
- Held knowledge transfers

- **Customer**

- Current measurements
 - Resourcing table (internal)
 - ZEF (internal & external)

- **Financial Metrics**

- $[Allocated\ hours] - [Reported\ hours]$
- Reported unallocated hours (excluding admin)
- $[\% \text{ of requests to GDC}] vs [GDC\ capacity\ of\ requests]$

Gate 6 validation

- Initial agreement for
 - Responsibility changes and process change
 - Implementation of BSC
- Next steps after Thesis