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TRANSITION TO AGILE

– Monitoring the transition from Waterfall to Agile Scrum at Neste Engineering Solutions NAPCON unit

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The purpose of this thesis was to monitor the transition of the company's management process from Waterfall model to Agile Scrum methodology and to measure the success of implementing the new working method. The main objective was to identify potential problems in the planning phase during the transition and to make suggestions for further actions to avoid those problems from reappearing.

The theoretical framework of this thesis presents the main principles of the traditional Waterfall and Agile project management methods and Scrum methodology. Through the case studies, this thesis examines the challenges other companies have met during the transition from Waterfall to Agile.

The empirical framework of this thesis is based on two online surveys that were conducted during the first months of the transition. The surveys aimed at clarifying the things that are going well in the transition and things that could be done better or differently. The surveys were targeted to 67 professionals at the NAPCON business unit and the response rates were 43% in the first survey and 40% in the second survey.

The main findings were that the transition to Agile requires an organizational change in the new management environments and practices, the commitment of all managers in helping the teams to adopt the new development process, and a mind shift by the Team members. The surveys at NAPCON also revealed, that while the overall communication and the understanding of the business decisions grew, more attention needs to be paid to adopting the new roles as well as the mind shift of the Team members. In addition, the needs of the Sales and Marketing department must be taken into account in future planning to avoid it turning into a bottleneck in the company.

KEYWORDS:

Agile, Scrum, Waterfall, Project management, Business operations management

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KOHTI KETTERÄÄ KEHITYSTÄ

- Esimerkkitapauksena Neste Engineering Solutionsin NAPCON-yksikkö

Tämän opinnäytetyön tarkoituksena oli seurata yrityksen toimintamallin muutosta Vesiputous-mallista ketterään Scrum -menetelmään ja mitata uuden työtavan jalkautuksen onnistumista. Päätavoitteena oli tunnistaa suunnitteluvaiheen mahdolliset ongelmat siirtymävaiheen aikana ja tehdä ehdotuksia jatkotoimista, jotta vastaavilta ongelmilta voitaisiin välttyä jatkossa.

Opinnäytetyön teoriaosa käsittää perinteisen Vesiputousmallin ja ketterän projektinhallintamenetelmän sekä Scrum-menetelmän pääperiaatteet. Tapaustutkimusten avulla opinnäytetyössä tutkitaan millaisia haasteita muut yritykset ovat kohdanneet siirtyessään Vesiputousmallista kohti ketterää kehitystä.

Opinnäytetyön empiirinen osa perustuu kahteen verkkokyselytutkimukseen, jotka toteutettiin siirtymävaiheen ensimmäisten kuukausien aikana. Kyselytutkimusten tarkoitus oli selvittää mitkä asiat siirtymävaiheessa on mennyt hyvin ja mitä asioita voitaisiin tehdä paremmin tai eri tavalla. Tutkimukset kohdistettiin 67 ammattilaiselle NAPCON-yksikössä ja vastausprosentit olivat ensimmäisessä kyselyssä 43% ja toisessa kyselyssä 40%.

Opinnäytetyön keskeisimmät havainnot ovat, että ketterään kehitykseen siirtyminen edellyttää organisaatiomuutosta uusiin johtamisympäristöihin ja käytänteisiin, kaikkien johtajien sitoutumista tiimien tukemiseen uusien tuotantoprosessien omaksumisessa sekä tiimin jäsenten ajattelutavan muutosta. NAPCON-yksikössä kyselytutkimukset osoittivat yleisen viestinnän ja liiketoimintapäätösten ymmärryksen kasvaneen, mutta uusien roolien omaksuminen ja tiimien ajattelutavan muutos vaativat edelleen enemmän huomiota. Myynti ja Markkinointi -osaston tarpeet on myös otettava huomioon tulevassa suunnittelussa, jotta vältytään tältä osin pullonkaulojen syntymiseltä.

ASIASANAT:

Ketterä kehitys, Scrum, Vesiputousmalli, Projektinhallinta, Liiketoimintajohtaminen

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1 INTRODUCTION

Managing business operations involves managing all day-to-day operations within the organization to produce goods or services as efficiently and profitably as possible (Investopedia 2018). In almost every company, people struggle with different issues that cause operational problems. These issues can be related to poor communication, insufficient requirements, unclear priorities, or resource usage. Problems diminish efficiency and cause delays and can have quite a distinctive impact on customer satisfaction and company's profit. These bottlenecks need to be recognized in order to get the processes working smoothly in a given timeframe and gaining the highest profit possible.

This thesis was commissioned by Neste Engineering Solutions Oy. The company is fully owned by Neste Corporation, and it operates in six different countries employing 1300 engineering specialists and subcontractors. The main customer segments are in oil refining and biotechnology, but the company serves companies on a global scale also in the gas, petrochemical and chemical industries. (Adel 2018; Neste Engineering Solutions 2018.) Inside Neste Engineering Solutions, business unit NAPCON offers a wide range of advanced process automation solutions to different industries and production plants to enhance their production. Additionally, the unit offers innovative solutions to train operators with simulators and games. (NAPCON 2018.)

NAPCON had problems with capacity management. There were both already known and still undefined bottlenecks in the processes that caused delays and other problems. They used the traditional Waterfall development model but had become aware that it was not necessarily the best way to continue if they wanted to work more efficiently and grow their overall result. In the beginning of 2018 the new model of NAPCON Agile Business Operations was introduced and the planning for the implementation of the Agile model was launched. (Adel 2018.)

The purpose of this thesis is to monitor the transition of the company's management process from Waterfall model to Agile Scrum methodology and to measure the success of implementing the new working method. The measurements were made twice at different points of the transition using online surveys. The results were analyzed and compared to each other and to the findings in the research literature, to see if the

transition was going in the right direction. The questionnaire was sent to all employees at NAPCON unit. The main research questions were:

- what are the pain points in implementing new working methods
- is the implementation of the new working method going well and
- what could be done better or differently

The main objective is to identify potential problems in the planning phase during the transition and to make suggestions for further actions to avoid those problems from reappearing.

The following chapter introduces the main principles of the traditional Waterfall and Agile project management methods and compares them, listing some of the advantages and disadvantages of both methods. Additionally, an agile project management framework, Scrum is introduced. In the third chapter, a literature review is done to identify the challenges other companies have met during the transition from Waterfall to Agile. The fourth chapter gives an overview of the reasons the NAPCON unit had to transition to Agile, and the last part presents the results of the two surveys. In the end, the results are evaluated, suggestions for further proceedings are given and the conclusions of the thesis are drawn.

2 MANAGING BUSINESS OPERATIONS

Most companies producing IT-based solutions aim to deliver their products to the customers on time and with minimal costs. Because the market is highly competitive, software development is expanding and becoming more complex, and the customer requirements are constantly changing it gets more and more difficult to meet the goals (Mahalakshmi and Sundararajan 2013). Many of the companies that follow one of the process models based on traditional methodologies are now investigating whether the agile approach could offer them the solution they need to get their products to the market faster and to be more flexible when changes are required.

After a few decades of traditional Waterfall methodology predominance, agile and iterative techniques started to gain ground when the Agile Manifesto was launched in 2001. It was written by a group of 17 like-minded professionals who got together to discuss better ways to build software. (Varhol 2015.) The values are as follow:

> *We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:*
>
> *Individuals and interactions over processes and tools*
>
> *Working software over comprehensive documentation*
>
> *Customer collaboration over contract negotiation*
>
> *Responding to change over following a plan*
>
> *That is, while there is value in the items on the right, we value the items on the left more.*
>
> *(Agile Manifesto 2001.)*

In this chapter about the project management models, the Waterfall and agile methods are explained. The positive and negative aspects of both methods are summarized in order to find reasons to transition from traditional model to agile. Additionally, one of the agile frameworks, Scrum, is introduced.

2.1 Waterfall methodology

Waterfall is a project management methodology which is the most popular version of traditional methodologies for software engineering and IT projects (Smartsheet 2018). It follows a sequential order of phases (Figure 1) where project moves forward to the next phase only after the current phase is completely finished. For example, at the beginning of a project, the requirements are carefully planned, analyzed and documented before design can even start. The process flows downwards like a waterfall and, there is rarely a chance to go back to make changes to what was done earlier. (Bannink 2014; Bowell-Morse 2016.)

In total, the Waterfall model has eight phases that must take place in a sequential order. The phases are requirements specification including its three sub-phases (conception, initiation and analysis), design, implementation, verification and maintenance. The verification phase includes testing and deployment. (Smartsheet 2018.)
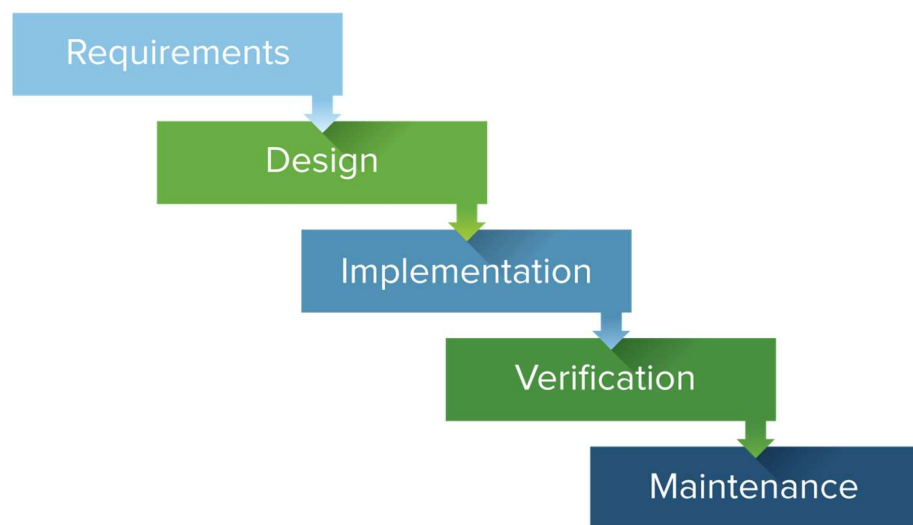

Figure 1. The traditional Waterfall model (Smartsheet 2018).

Traditional methodologies like Waterfall are considered inefficient, inflexible and slow project management approaches in many industries (Bannink 2014). Still, it can be a useful model for heavyweight industries which appreciate better predictability when it comes to budget, timeline and scope (Aston 2017).

2.2 Agile approach

Agile development is defined as an incremental, iterative approach which prefers to respond to changing requirements over time rather than make extensive and strict planning at the beginning of the project. The phases of the Agile development cycle (Figure 2) do not differ much from the phases of the Waterfall model but, they do not move forward in the same way. The phases in Agile development are flexible, constantly evolving and many of them can be executed simultaneously. (Smartsheet 2018.)

Figure 2. Agile Development cycle (Smartsheet 2018).

2.3 Traditional vs. Agile model

As mentioned before, the phases of the traditional Waterfall model and the Agile model are not that different, they just perform in a different way. Both models have the same goal: to deliver quality products to customers efficiently. (Smartsheet 2018.)

Waterfall is known for its straightforwardness and it is used in simple, unchanging projects. Because the structure is the same for every project and the model goes through the same phases every time, it is easy to understand and to follow. Each phase has a specific list of tasks and milestones, so it is easy to control and manage. There are also

fewer risks involved. Every phase requires certain tasks to be fully completed and reviewed for possible mistakes or issues so that those can be fixed before moving on to the next phase. Waterfall requires comprehensive documentation for every phase which gives a better understanding of the whole project. Additionally, when everything is extensively documented, it can be reviewed later by clients or stakeholders or even a new Team member if necessary. (Aramyan 2016; Smartsheet 2018.)

On the other hand, because Waterfall is a sequential model, changes or corrections to earlier phases are difficult and expensive to execute. This affects the first phase of Waterfall drastically. Planning and gathering accurate requirements in advance to cover the whole project is necessary. This requires conversations with customers and stakeholders to identify their needs and expectations for the end result. In most cases, they find it hard to pinpoint their exact wants and needs at such an early stage of the project. They would rather follow the progress first and make the final decisions later. This does not fit the Waterfall model very well. On top of that, deadlines are long. Customers and stakeholders will not see a working end deliverable or even a demo until very late in the project lifecycle. All the points mentioned above might lead to a situation where the end product is not what the customer actually needs anymore because requirements have changed over time. (Aramyan 2016; Olic 2017a; Smartsheet 2018.)

Agile is described as a lightweight development method in which the end-goal does not need to be clearly defined at the beginning of the project. Rather, it gets clarified as the project progresses and requirements evolve. In the Agile model, the whole project is split into smaller increments which are planned, designed and delivered separately. This, and the short iteration cycles make it possible for the changes to be easily implemented at any phase of the project. The team can now focus on high-quality development and testing which will help to identify and solve any issues faster. Customers and end users have several opportunities to see the outcomes of the iteration cycles and give feedback or even ask for changes to some features. The feedback from customers, end users, and Team members is used to improve upcoming iterations. (Aramyan 2016; Smartsheet 2018.)

Flexibility in Agile is usually a positive feature but it has its downsides as well. Since the project is split into smaller increments and tasks are often reprioritized or changed between iteration cycles, it is difficult to do concrete planning or set clear deadlines for the end product delivery. Agile Manifesto (2001) prefers "working software over comprehensive documentation", so often, proper documentation gets neglected. This is

usually caused by lack of clearly defined expectancies and deliverables. All in all, Agile is more complicated than the linear, sequential Waterfall. Some training is required at the beginning in order to get the teams to understand and use the model well. (Aramyan 2016; Smartsheet 2018.)

2.4 Scrum

One of the most popular methodologies implementing Agile is Scrum. According to the creators of Scrum Ken Schwaber and Jeff Sutherland (2017,3), "Scrum is a framework for developing, delivering, and sustaining complex products." It is based on the Agile Manifesto and it focuses on how the work is done instead of what is done. (Bannink 2014; Olic 2017b.)

2.4.1 The Scrum Team

The Scrum Team consists of three specific roles: a Product Owner, a Scrum Master and the Development Team. Scrum Teams are cross-functional and self-organizing, which means they have all the competences needed to accomplish the work within their team, and that they decide themselves how best to do it. (Schwaber and Sutherland 2017, 6.)

The Product Owners' responsibility is to maximize the value of the product the development team produces. This person alone is responsible for managing the Product Backlog, which includes prioritizing the items in it and making sure it is visible, transparent and clear to all parties. (Schwaber and Sutherland 2017, 6.)

The Scrum Master is responsible for ensuring that Scrum theory, practices, rules, and values are understood and followed. He serves the Product Owner, the Development Team, and the organization by coaching them on the Scrum process and by helping them to adjust their interactions and allowing the Scrum Team to produce the best possible value. (Schwaber and Sutherland 2017, 7-8.)

The Scrum Master guides the Product Owner to manage the Product Backlog effectively and arrange it to maximize value. For the Development Team he resolves any impediments and distractions and facilitates the Scrum events. The Scrum Master serves the organization by leading and coaching the Scrum adoption, planning Scrum implementations within the organization and working with other Scrum Masters to

improve the effectiveness of Scrum in the organization. (Schwaber and Sutherland 2017, 7-8.)

The Development Team is responsible for delivering a tested and working product or increment of the end product at the end of each Sprint. The Team is empowered by the organization for managing and organizing their own work and optimizing the overall efficiency and effectiveness. The Team members themselves decide how they break down the requirements from the Product Backlog into smaller tasks to work with during the Sprint in order to deliver a working product at the end. (Schwaber and Sutherland 2017, 7.)

As mentioned earlier, the Team is cross-functional; it consists ideally of 5 to 7 professionals with a wide range of skills. The Team members with different skill-sets train and help each other, in order to avoid someone turning into a bottleneck blocking the delivery of the work and to ensure a successful end result of the Sprint. (Radigan n.d.)

2.4.2 Scrum Artifacts

The three main artifacts defined by Scrum are the Product Backlog, the Sprint Backlog, and the Product Increment. These are designed to maximize the transparency of the key information in order to provide the same understanding of the artifact to everybody. (Schwaber and Sutherland 2017, 14.)

The Product Backlog is a prioritized list of the functionalities known to be needed in the product. The Product Owner is responsible for highlighting the most valuable features for the team to first work on. The list is never complete, it is constantly evolving as features, functions, requirements, enhancements, and fixes are being changed. (Schwaber and Sutherland 2017, 15.)

The Product Backlog is refined and revised by the Product Owner and the Development Team. It is the act of adding detail, estimates and order to the Product Backlog features. Higher ordered features are more detailed and clearer and can get more precise estimates than the lower ones. The highest priority features and their desired level of completion need to be refined for the upcoming Sprint. This way, the features are ready for selection in the Sprint Planning. The Development Team is responsible for the final estimates as it is the group of people who will perform the work. (Schwaber and Sutherland 2017, 15.)

The progress toward completing projected work is tracked by the Product Owner and is made transparent to all stakeholders (Schwaber and Sutherland 2017, 16).

Sprint Backlog is a list of features the Development Team has selected from the Product Backlog for the upcoming Sprint. It also includes a plan for delivering the product Increment and achieving the Sprint Goal. The Sprint Backlog emerges during the Sprint as the work proceeds and the Development Team learns more about the work needed to achieve the Sprint Goal. Only the Development Team can change or modify the Sprint Backlog during the Sprint. It is a highly visible, real-time picture of the work already done and yet to be done during the Sprint. (Schwaber and Sutherland 2017, 16).

Increment is the sum of all features completed and tested during the Sprint. Additionally, it should be in a potentially shippable state (Schwaber and Sutherland 2017, 17).

2.4.3 Scrum Events

The process in the Scrum framework (Figure 3) flows forward with specific, unchanging set of steps (Smartsheet 2018). The process starts by defining the Product Backlog ready to be used in the Sprint Planning phase, in which the Sprint Backlog is defined. It continues to the Sprint lasting 2-4 weeks with Daily Scrum meetings and finally resulting in a "potentially shippable product increment". The Sprint ends with a Sprint Review meeting and is followed by a Sprint Retrospective meeting.
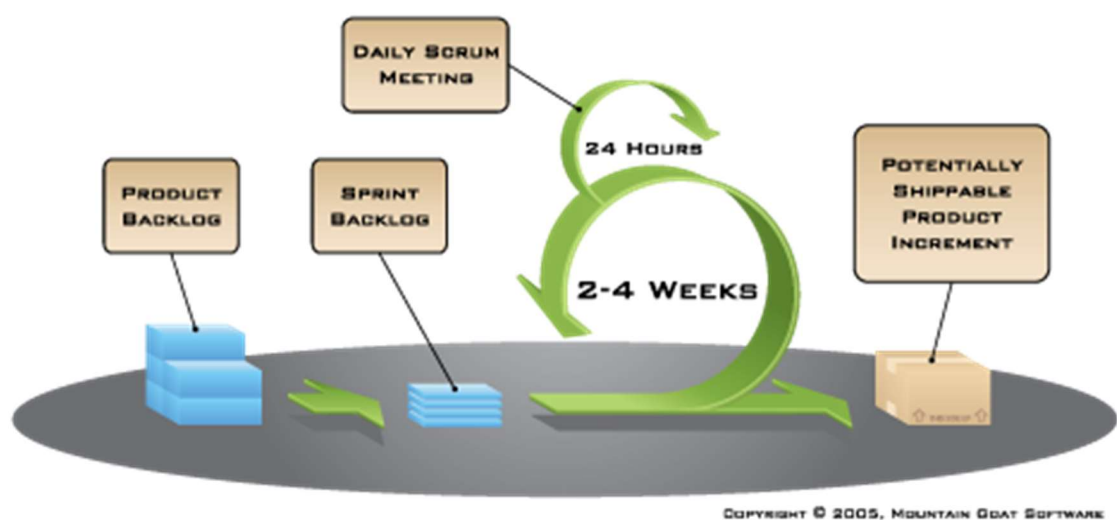

Figure 3. Scrum framework (Mountain Goat Software 2005).

Sprints are a series of fixed-length iterations during which a potentially shippable product increment is produced. The next Sprint starts right after the previous Sprint closes and every Sprint has its own Sprint Backlog which defines a plan and the goal to be reached. The maximum length of a Sprint is one month. This limits the risk to a shorter period of time and allows a more frequent inspection and adaptation of the progress toward the Sprint Goal. If the time period is allowed to expand to over one month, the complexity may rise, and the risk may increase. (Schwaber and Sutherland 2017, 9.)

After the Sprint Backlog has been agreed, the goal is set, and the Sprint is ongoing, the Development team is working independently. Any changes that would compromise the Sprint Goal are not allowed and the Team cannot be affected from the outside. Sprint can be cancelled only by the Product Owner based on reasonable grounds. Thus, this is done very rarely due to the short duration of the Sprints. (Schwaber and Sutherland 2017, 9-10.)

Sprint planning is performed by the whole Scrum Team working in collaboration. They define the work to be done in the next Sprint and the Sprint Goal. The duration of this meeting is time-boxed to a maximum of 8 hours, or less if the Sprint is shorter than one month. (Schwaber and Sutherland 2017, 10-11.)

In the Sprint Planning meeting the Product Owner describes the highest priority features of the Product Backlog. The Development Team discusses the features, decides what can be achieved during the upcoming Sprint and how, and then splits the features into smaller tasks. These selected features and the plan to deliver them is called the Sprint Backlog. In collaboration with the Product Owner, the Team also defines a Sprint Goal, which is a short description or an objective of what the Development Team has planned to achieve during the Sprint. (Mountain Goat Software 2018a; Schwaber and Sutherland 2017, 10-11.)

Daily Scrum is a strictly time-boxed 15-minute event held each day of the Sprint at the same time and location. Daily Scrum meetings focus on what each Team member has accomplished the day before, what they will do the present day and if they have met any impediments that need to be removed. This way, the Development Team inspects the progress towards the Sprint Goal and sees how the progress is trending toward completing the work in the Sprint Backlog. More detailed discussions, impediments or other issues raised during the Daily Scum are handled after the meeting. (Mountain Goat Software 2018b; Schwaber and Sutherland 2017, 12.)

In the Scrum Guide™, the authors Schwaber and Sutherland (2017, 12) summarized the Daily Scrum as follow:

> *Daily Scrums improve communications, eliminate other meetings, identify impediments to development for removal, highlight and promote quick decision-making, and improve the Development Team's level of knowledge. This is a key inspect and adapt meeting.*

Sprint Review is held at the end of the Sprint. It is time-boxed to a maximum 4-hour meeting during which the Development Team demonstrates the work it has done, answers questions about the Increment and discusses with other stakeholders attending the meeting what went well during the Sprint, what problems they met and how the problems were solved. The Product Owner takes a look at the Product Backlog and explains what features have not yet been done. The entire group discusses the next steps and expectations and provide valuable input to the following Sprint Planning. As the result of the Sprint Review the Product Backlog is updated to define the probable features for the next Sprint. (Mountain Goat Software 2018c; Schwaber and Sutherland 2017, 13.)

Sprint Retrospective is the last thing done in a Sprint. It is held right after the Sprint Review and before the next Sprint Planning. The whole Scrum Team reflects on the work done during the Sprint, identify potential improvements and plan on how to implement these positive changes in the next Sprint. The event's duration is three hours at the most for one-month Sprints. (Schwaber and Sutherland 2017, 14.)

3 LITERATURE REVIEW

The literature review studies the challenges other companies had when they went through the transition to Agile, how they managed these challenges, and what they learned. Later, these findings are used to identify the possible challenges during the transition to Agile in the NAPCON unit.

Chen, Ravichandar and Proctor (2016) stated in their case study of Cisco Systems that companies in transition to Agile face two major challenges. The first one is to help business units and teams to adopt the new development process and the second one is to develop new management environments and practices that enable and support agile development practices.

At Cisco they started the transition by identifying potential benefits for transition to an Agile method such as faster to market and higher employee engagement. Then they evaluated three criteria to assess the readiness of business units to make the transition to the Agile method. The first criteria is leadership buy-in. The commitment from all managers is important because they need to support the engineering teams to change their behavior and adopt new culture. The second criteria is task interdependence. The tasks that are somehow dependent of other teams' tasks make it more complex and difficult to follow the agile development guidelines. The third criteria is early-stage product development. If the project under development is in mid to late stages in the Waterfall process, it will be too expensive and disruptive to make the transition. But if a project is on its early stage in the development cycle and the tasks are not intertwined with other teams it is easier to start the transition to Agile with minimal disruption. (Chen et al. 2016, 3-4.)

After the evaluation business units and teams that were ready or almost ready to transition to the Agile method started to go through a multi-step process to successfully adopt it. These steps include working condition adjustments, such as agile team roles, task interdependence and even seating layout, agile training and embedded coaching and review for further improvement. According to Cisco's experience there are no best practices in the Agile development method, there are only better practices. "The key is to derive valuable learning from the practices and to build a culture of continuous improvement" (Chen et al. 2016, 5). To help business units and teams in transition to the agile method, Cisco developed standardized transition documents. The company also

set up an internal website which included tools and effective practices for the engineering teams to use and improve their actions. (Chen et al. 2016, 4-5.)

What comes to developing new management practices at Cisco, the analysis focused on four aspects. First is leading agile engineering teams. Managers must reduce micromanaging, learn to delegate and empower engineering teams instead of dictating what is needed to be done and when. They also need to support agile teams by removing task barriers and protect them from excessive external requests. (Chen et al. 2016, 5.)

The second aspect considers planning and forecasting in the Agile development process. In the Waterfall process, the planning cycle can be 12 or 18 months and this gives predictability to planning. This is not the case in Agile development because of the short two to four-week sprints. Only the upcoming sprints are planned very carefully. Long-term forecasting and planning is possible only at high level due to changing customer reactions and requirements between the sprints. (Chen et al. 2016, 6.)

At Cisco, they developed a process to improve the accuracy and predictability of the planning. They have two-week sprints, and in every sprint they have a conversation about the new product features with their early collaborative customers in order to keep the development on the right track. They also have the release of the new product features every three months. First, the managers identify use cases for the new product the engineering team starts to develop. Then they split the use cases into detailed engineering tasks, prioritize them and define in which future quarter these tasks belong to in the plan. Their scope for the plan is the first six to 12 months. Meanwhile, the engineering team organizes and arranges future work. (Chen et al. 2016, 6.)

When the engineering team starts to execute the planned tasks, the other team adjusts the future plan continuously according to the feedback from the customers and the development team. This way they are able to have quite accurate, at least six-months' predictability. (Chen et al. 2016, 6.)

The other two aspects are coordinating tasks and recruiting early collaborative customers (Chen et al. 2016, 5). Although these aspects are equally important in adopting Agile development method, they are less relevant for this thesis as it is concentrating more on management level business operations.

In the other case study regarding Portbase, Bannink (2014) also summed up similar main findings: The transition to Agile requires organizational change and the mind shift by the

Team members. Managers need to leave a command and control structure behind and learn to lead the team instead of managing it. They also need to empower the team to work independently, remove any impediments that might slow down the team's work and support the team by improving communication between Team members. Team members need to commit to give priority to team goals instead of individual goals, provide value to customer needs and ensure the quality of the product. At every level of the organization it is vital to understand the Scrum values in order to be successful oi transition. (Bannink 2014, 9.)

At Portbase they were under pressure to reduce the time-to-market of their software. The design phase took too much time and communication was poor. With Business Analysts and Scrum, they could reduce specification upfront and were able to respond on changes faster. (Bannink 2014, 6.)

All teams made the transition to Scrum in one to two months although, the rest of the organization continued to work the old way. The pre-specification and release process was still done in the traditional way, which caused efficiency problems. By placing the Business Analysts in the team, they would solve the efficiency problem for that part. The release process took two months of testing as they had a lot of dependencies between different services and the whole system needed to be tested before the launch. To solve the efficiency problem for the time-to-market issue, they needed to separate the services to independent units that can be handled and tested within the Scrum teams. (Bannink 2014, 9.)

The organization-wide mind shift was still lacking. As Bannink (2014, 9) noted: "Portbase needs to focus on the organizational changes required to support the Scrum teams". They already had hired external Scrum Masters to coach the teams and to monitor the process and remove impediments. To keep the processes and teams in good function also in the future, they needed to have the Scrum Masters in-house. They also needed to establish and document standard ways of working to avoid the knowledge to flow out of the organization. (Bannink 2014, 9.)

Schatz and Abdelshafi (2005) shared their experiences of successful transition to Agile at Primavera. They discovered that it is important to have a person in the company who is committed to moving to Agile and willing to take the risk, who stands up for critics and acts as support for the management and the team and, between these two. In the article

they also shared some tips for others regarding moving to Agile. (Schatz and Abdelshafi 2005, 3.)

When the company starts the transition, it is very important to get the executive's sincere support. Agile grows from bottom to top, adopting new culture takes some time and it does not happen without problems and failures. That is why it is very helpful to use objective coaching from an outside source. It helps to enforce a learning culture and find the important spots that could be improved. Schatz and Abdelshafi (2005, 3) also suggest that using the established Agile language helps foster creativity and prevents people from slipping back into their old working habits. When people get positive reinforcement from their superiors they stay in a learning mode. While learning and trying new things, creativity will take hold and performance will rise. It is also critical to focus on teamwork and team building. Self-managing teams perform their best when managers learn to delegate to them properly and Team members work together fluently. (Schatz and Abdelshafi 2005, 3.)

Moving to Agile requires hard work throughout the organization because it makes changes to the whole company culture. But it comes with great benefits: it can create a sustainable pace for the development team and deliver high-quality and complex systems without working overtime. (Schatz and Abdelshafi 2005, 3.)

Friis, Ostergaard and Sutherland (2011, 2) did a survey in 2009 of the Finnish company Sulake, which succeeded in implementing Scrum across the organization within 6 months. They were interested to learn more about the managers' role in Scrum. Their study was based on questionnaires for the managers and non-managers. The topics of the questionnaire for the managers were: how did they experience the implementation to Scrum, and how did they manage in the Scrum process. The topic of the questionnaire for the non-managers was the team's experiences with management related to the Scrum process. (Friis et al. 2011, 2.)

The study revealed that the managers experienced several changes when working in a Scrum environment. Most commonly they reported that productivity, quality and transparency increased. They also identified the self-organizing teams as one of the most significant changes and felt that it was a challenge to keep up with the team, to keep the backlog up-to-date, to stop micro-managing the teams and "to give space for the developers". Still, the biggest challenge mentioned was convincing the skeptics who did not believe in Scrum. (Friis et al. 2011, 4-7.)

When asked for a word of advice to managers in other organizations implementing Scrum, the managers at Sulake recommended to start slowly and to give it time, since the whole implementation does not happen overnight. It is better to follow the rules of Scrum and understand the benefits before acting further. (Friis et al. 2011, 4.)

Most managers at Sulake attended the daily meetings regularly to stay informed about the teams' Sprint status, and some also to answer questions. They all believed that Scrum gives them better knowledge of the status of the project. In addition, the demos at the Sprint Reviews allow them to easily follow the progress not only of their own department but of other departments also. (Friis et al. 2011, 5.)

The study showed that managers need to have good communication skills and to be able to motivate the Team members to organize and take responsibility themselves. The managers can no longer dictate what the team should do next or how. They need to stop listing requirements and focusing on details and start to communicate visions and goals instead. (Friis et al. 2011, 7.)

The team's role also changes with Scrum. As Team members need to take more responsibility and initiative, the company's hiring practices change. The managers are looking for people that are flexible and open-minded with good social skills rather than people that are stuck with their own ways. (Friis et al. 2011, 4.)

Scrum will make dysfunctions in an organization visible if it is implemented correctly, but it will not solve them. Solving the problems demands organizational change, open minds, and hard work. When Sulake switched the company to Scrum it revealed that while software development teams started to function in monthly sprints the other departments, such as marketing, finance, etc. became bottlenecks in the company. This was solved by changing their processes to monthly sprints also. (Friis et al. 2011, 2.)

These findings give good guidelines to the study of the current development of transition to Agile in the NAPCON unit.

4 LAUNCH OF THE TRANSITION

In the NAPCON business unit, there are 67 employees divided under Sales and Marketing, Product Management and Project and Services execution. Under Project and Services, there are seven different departments divided by solutions they are producing.

The different projects in the seven different departments were managed more or less by following the steps of the traditional Waterfall approach. This was not optimal due to the nature of their development projects that can have rather long delivery times. Big releases were done only at the end of the long projects, and serious issues often appeared in the last meters before the launch. Many things were left to the last minute and this caused delays in the final delivery. The predictability of overall costs was often weak because of these issues. They also had capacity management issues and disagreements over the prioritization of resource usage between the bidding work in new sales and the ongoing development projects.

There was a need for change. NAPCON wanted to steer its business actions upfront rather than make corrective actions constantly afterwards. They wanted to see and evaluate the results more frequently than at the end of the projects. The resources needed to be optimized and allocated correctly between different actions. Additionally, recognizing bottlenecks in the processes was one of the main objectives.

Operational excellence was chosen as a Must-win Battle for the year 2018 at NAPCON. As part of the key activities, they decided to enhance the delivery speed and quality with agile operations. The expectations over solving the issues mentioned above, enhancing the effectiveness of the processes and growing the overall result, were high.

NAPCON presented the business plan of NAPCON Agile Business Operations to the personnel and started to test Scrum framework with two development teams in January 2018. After three three-week iterations, the management was ready to take the next step. The first Rolling business planning phase regarding the whole NAPCON unit was launched and all the teams started to work in Scrum environment.

5 AGILE BUSINESS OPERATIONS IN ACTION

The empirical part of this thesis is based on two online surveys. An online survey was chosen as a research method to gather quantitative data from the respondents anonymously and efficiently. This method makes it possible to reach every respondent regardless of their location. They also have the freedom to choose the most suitable time for them to answer.

The questionnaire for the surveys was done with Google Forms. It is an easy and fast tool to use, and it works well with different devices. The same questionnaire was used in both of the surveys with one small addition regarding the roles of the respondents to the second survey. The structure of the questionnaire was simple and short with only nine questions, so Google Forms was more than an adequate tool. (Appendix 1.)

The online surveys concentrated on the Rolling business planning phase at NAPCON management level. The aim was to find out how well they managed the planning phase, how well they succeeded in putting the plans into action and where they needed to develop their actions more.

In the Rolling business planning a lot of information is gathered together from different sources to form a big picture of the whole project portfolio, product development plans, new sales efforts and upcoming events. Also, the capacity review is done to check the available knowledge resources. With this information, the NAPCON management is able to set the high-level requirements and prioritization for the upcoming sprints. Planning is done for six weeks, for two three-week sprints at a time. (Adel 2018.)

The first Rolling business planning regarding the whole NAPCON started at the beginning of March. The following three-week sprint was due to start on the 7th of March. The first survey was conducted at the end of the first iteration on the 23rd of March and the second survey followed one month later on the 24th of April, a week after the second Rolling business planning round. Both questionnaires were addressed to the NAPCON management, and all the managers and the development teams. The purpose of these surveys was to gather information regarding the planning and the success of putting the plans into action.

The surveys were sent to almost 70 NAPCON professionals, and they were both open for five days. As mentioned earlier, replying was anonymous and voluntary.

5.1 Questionnaire results

The results of the two surveys are presented in the following subchapters side by side one question at a time. This helps in comparing the results. The results are analyzed in the chapter 5.2.

The first survey gathered 29 responses and the second one 27 responses, response rates being 43% and 40%. The survey starts with a background info, asking for the respondents' role in the organization.

5.1.1 Your role in the organization

In the first survey the options for the first question were:

- NAPCON Management team
- Product Manager
- Project Manager
- Line Manager
- Team member

11 out of all 20 managers including the NAPCON Management team responded to the first survey, while only 18 out of 47 Team members gave their response. In the second survey the option for Sales & Marketing, which was unintentionally left out from the first survey, was added, in order to get input also from the sales and marketing personnel. This time 14 out of 20 managers, including NAPCON Management team and 13 out of 47 Team members responded. (Figure 4.)
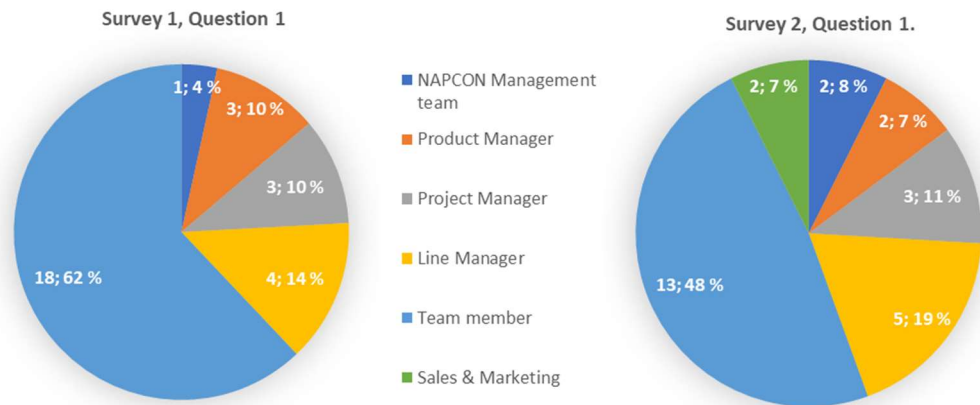
Figure 4. Your role in the organization.

5.1.2 Did you participate in …

NAPCON Rolling business planning consists of pre-meetings and the decision meeting. Sprint planning is also included in the surveys to find out how many of the respondents actually attended to the Sprint Planning meeting.

Question 2 of the surveys gathered data on the participation to different planning meetings. Response options were:

- No
- No, but I should have been there
- No, but I was aware about this
- Yes

The purpose was to find out how aware people were of these planning phase meetings, and if anyone felt s/he should have been present but did not get the necessary information or otherwise could attend.

The first meetings were Rolling business planning pre-meetings (Figure 5). During the first planning round 11 managers responded, and 9 of them attended the pre-meetings. One responded that s/he should have been there and other one did not attend otherwise. During the second planning round, 10 out of 14 managers attended, while one should have been there and 3 respondents did not attend otherwise. When it comes to Team members, 3 out of 18 during the first planning round and 3 out of 13 during the second

planning round attended the pre-meetings. During the first planning round 4 respondents said they were aware of the meetings and 11 responded "No". During the second planning round a majority of the Team members, 10 out of 13 responded "No" to the question concerning pre-meetings.
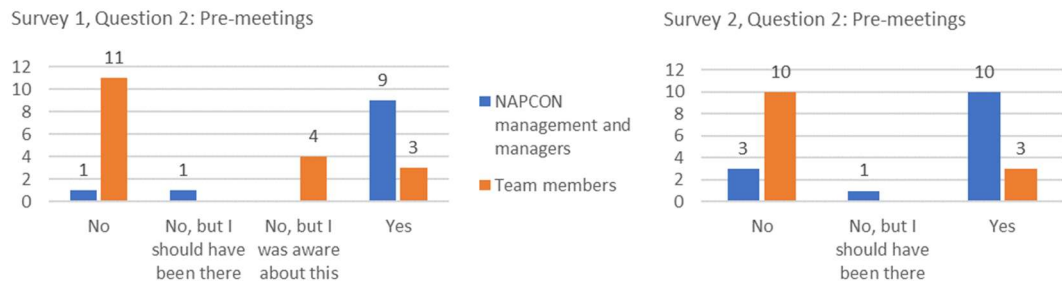

Figure 5. Rolling business planning pre-meetings

The second meeting in the Rolling business planning phase is Decision meeting (Figure 6). It seems that just a few of the respondents were attending both of the planning rounds and only 3 managers felt they should have been there for the first planning round. None of the Team members felt they should have attended.
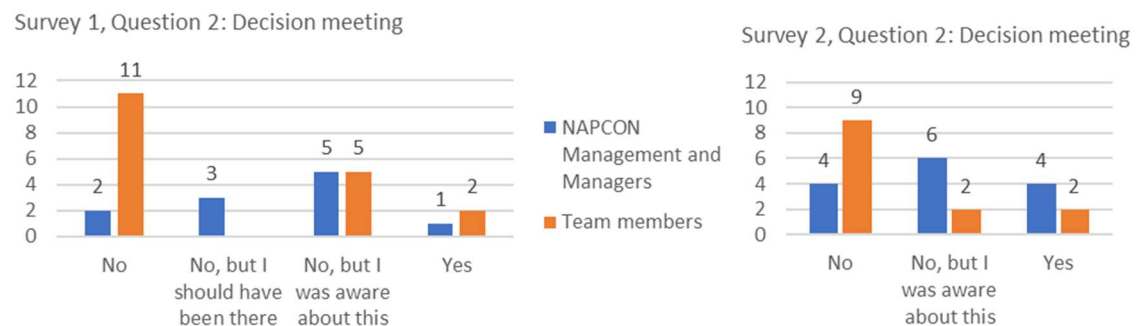

Figure 6. Rolling business planning decision meeting

In Sprint planning (Figure 7), 11 out of 18 Team members attended the first planning round, while one said s/he should have been there and 3 did not attend but were aware. In addition, 7 out of 11 managers attended. During the second round 9 out of 13 Team members attended and one was aware of the meeting. 8 out of 14 managers attended and one of 14 felt s/he should have been there.

Survey 1, Question 2: Sprint planning
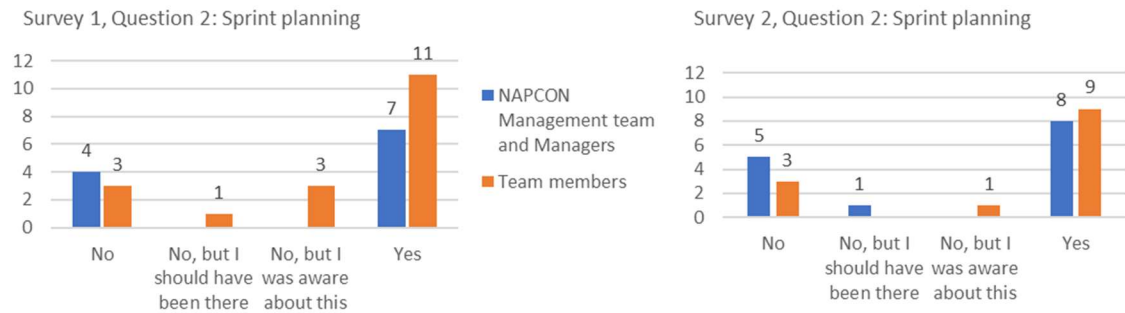
Survey 2, Question 2: Sprint planning

Figure 7. The Sprint planning meetings

5.1.3 What was good?

The next two questions in the both surveys were open-end questions. First the respondents were asked to define what was good about the meetings they attended. In the first survey the main topics mentioned were transparency and good discussions about all NAPCON projects and products, upcoming tasks, business needs and priorities. The first survey got 24 responses and the response rate for this question was 83%.

> *"Organized and methodical way to go through the big picture of the business plan relevant situation, aided knowledge transfer all the important stakeholders (product manager, project manager, line manager). So far this has been a huge improvement over the previous way to organize and manage work."* (Line manager)

> *"Gives visibility across NAPCON products and scrum teams; makes high-level (=NAPCON) targets and priorities clear for participants."* (Project manager)

> *"More organized way of working and clearer task."* (Team member1)

> *"The discussion about the topics to be done in near future."* (Team member2)

> *"Workflow improved as tasks are known beforehand."* (Team member3)

In the second survey the third question got 20 responses and the response rate was 74%. One answer from the NAPCON Management team was: "There was much more clarity to projects than before." This was the main topic in the other responses too.

> *"Information flow and inter-project dependencies have been improving all the time. Portfolio sync meetings have been getting closer to give a good big-picture view of all the things happening. All in all progress has been*

positive and improvement significant over the previous management/business planning structure.” (Line manager1)

“Understanding (everyone's) has grown and meetings were more efficient.” (Line manager2)

“The engagement was definitely on a better a level this time and the meetings were more structured.” (Project manager)

“More prepared, more fluent and more correctly targeted meetings.” (Project manager)

“Everyone had possibility to share information related to projects and tasks.” (Team member1)

“I liked the introduction of top priorities so that the backlog/sprint tasks could be adjusted accordingly. Also it provided a feeling of transparency & involvement which I think is good, especially if desired that all employees feel involved and are working towards the same goal.” (Team member2)

5.1.4 Improvement ideas

The fourth question was “What could have been done better or differently in the meetings you participated in?” The first survey got 23 responses and the response rate was 79%. The responses brought up issues relating to unclear product backlogs, processes and tools, missing input from Sales, and overall efficiency.

“There was a lot of confusion about Excel files, versions of them, how to divide work for organizational teams and Scrum teams.” (Line manager)

“Input from sales would have been valuable.” (Project manager1)

“Backlogs should be in better shape (which is improving all the time!) and not all related Supervisors, PMs and PDMs were invited in first meetings.” (Project manager2)

“Backlog should have been organized by the product owner. Now we had to guess what tasks had budged / are important.” (Team member1)

“The meetings thus far have been done somehow in controlled chaos. But, maybe it's getting better.” (Team member2)

“As always with the meetings, you could be more efficient.” (Team member3)

The responses of the second survey highlighted the need for accuracy in work descriptions and prioritizations. Also the problems with the planning tools were brought up again. This time 20 responses were received and response rate was 74%.

"The Argumentation of project work needs to be more clearly described especially for development projects. Risk relationships to customer delivery projects needs to open based on facts." (NAPCON Management team)

"A commenting round from designers would increase and ensure the accuracy of collected data." (Line manager1)

"All work is still done via excel and multiple copies so one needs to be careful to make corrections to right one. Some things were forgotten. Current process relies too heavily individuals' memory to remember all ongoing activities in planning sessions." (Line manager2)

"The roles, responsibilities and expectations of each role should be clearly described." (Line manager3)

"Involve all product owners to all planning meetings/discussions to get better understanding of prioritizing needs and the work needed. Try still to estimate better with more detailed discussion and based on earlier rounds results/ discussions the more accurate estimate for next two sprints." Project manager)

"I would like to see prioritization to be done even more clearly." (Team member)

5.1.5 The level of information provided at any step?

The fifth question of the surveys asked to rate the overall level of information provided at any step. The reply options were on the scale of 1 to 5, where 1 was poor and 5 was excellent. In Figure 8., the responses to surveys 1 and 2 are shown as a side by side comparison and by the role of the respondents. The overall results show that there had been some improvement after the first survey.

Figure 8. The level of information provided at any step

5.1.6 Improvement ideas for communication

Next the respondents were asked to reply an open-end question: "If the information provided was not enough, at what point and what kind of information would you like to have more?" The response rates in the first survey were 76% (22 answers) and in the second survey 55% (15 answers).

In the first survey the respondents asked for more information about the decisions done and planning phase in general. Also, clarification of responsibilities and sales and marketing cases were missed:

> *"Sales and marketing cases were missing from first version. No plan made for surprises regarding new ad hoc sales case or projects. Only one week after the rolling business plan and many new must make sales cases emerged."* (Line manager1)

> *"Clearly drawn diagram/skeleton plot example (preferably with names) who is responsible for what, what is expected from different roles etc. We have seen the general plot, but a more concrete example would be needed. (Perhaps the scrum training will clarify things?!)"* (Line manager2)

> *"Better communication about the decision done would have been nice*." (Project manager)

> *"I have not received any information about the business planning. I'm sure I can find the information about the planning period, but I have not heard anything about what has been decided and not been given a link to where I can find more information."* (Team member1)

> *"More information from the rolling business planning: visibility on the emphasis between different products/projects in different scrum teams."* (Team member2)

In the second survey, the responses showed that upper level prioritization and strategy is still unclear and more information is needed:

> *"It would be good to have the financial impact visible for each project."* (NAPCON Management team)

> *"Some view to what is pre-planned, planned and decided on.... now I only hear about those afterwards."* (Sales & Marketing)

> *"It would be nice to see the whole RBP/direction of strategy be summarized by Perttu at least at the monthly meetings - this is of course touched by other topics, but it would be still beneficial to communicate the direction of the strategy from the management to those who execute the strategy. This would be an important step and aid the line/product/project managers effort in day-to-day execution of the RBP/strategy."* (Line Manager)

> *"I still find it a bit unclear exactly how the RBP is affecting day-to-day work for us "low levels" (except for the sprint planning), but I think this is a really good initiative overall. It gives a clear signal to us employees that, as a corporation, we'll be relevant for a long time in the future, adjusting & doing future scenarios/trend scanning. I think it's very courageous to implement this way of working, and I applaud it!"* (Team member)

5.1.7 The success of Rolling business planning rounds

The seventh question of the surveys asked to rate the success of Rolling business planning rounds. As in question five, the reply options were on the scale of 1 to 5, where 1 was poor and 5 was excellent. In Figure 9., the responses to surveys 1 and 2 are shown as a side by side comparison and by the role of the respondents. As it can be seen, the planning process is developing to the right direction.

Figure 9.The success of the first and the second round of Rolling business planning

5.1.8 impact of the change

In question eight of the surveys, the purpose was to find out how people felt this change affected their work. Over half of the respondents, 18 out of 29 (62%) in survey 1 and 18 out of 27 (67%) in survey 2, felt that the impact was quite positive (4) or very positive (5). Only one respondent of the first survey felt that this change affected his/her work very negatively (1) and two responded that the impact was quite negative (2). In the second survey, nobody felt the impact was very negative (1), and only three responded the

impact was quite negative (2). The results are shown as averages by the role of the respondents in Figure 10.

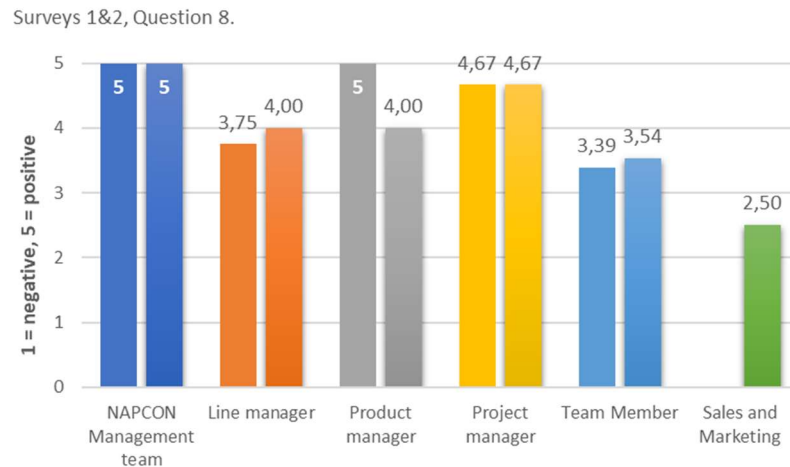

Surveys 1&2, Question 8.

Figure 10. What kind of impact do you see this change has on your work?

5.1.9 Free comments

The final question of the surveys was voluntary open-end question to give free comments. The first survey got 12 responses, 41% of all respondents.

> *"Inputs from sales and marketing were received way too late. I believe synchronizing preparations needs to be improved and our way to maintain capacity for making quotations."* (NAPCON Management team)

> *"The first round of Rolling Business Planning already showed significant and important bottlenecks, resulting into corrective measures, which is a very positive signal. Transparency of resource need, and which projects they affect has been a huge improvement. Perhaps some visualized tool could be used to highlight the relations of resource dependencies in the future (e.g. Pert charts or similar?)"* (Line manager)

> *"I see the potential for improvement at its best since previous 15 months (long time!). This doesn't mean that the current state is good but potential to improve it is finally there. Finally something more is happening with resourcing which could have positive impact on NAPCON business and more like enable than block the growth strategy."* (Product manager)

> *"One challenge in applying the scrum is that the scrum team is doing work of several projects. Co-ordination between projects and scrum team can be challenging. The order process from Neste side (budgeting hours in for whole year in specific tasks) is not so agile. We should try to make the ordering process more agile in a way, that the customer (=Neste) just pays for the hours we have been done and prioritization between projects and*

features is done continuously during the year with the customer so that we don't have to care all the time if some specific feature has funding/budget. Budgeting the hours for the features for the whole year is more like waterfall way of doing things." (Team member1)

"Some first comments from the delivery persons that were about to join a bidding project - they said that sorry but this is not in the sprint so I have no time for this... So actually we had to spend much more hours on getting settled who will participate." (Team member1)

The second survey got 15 responses, 55% of all respondents.

"This is the first time we see our project portfolio and time-allocation to be aligned with the business plan and agreed priorities." (NAPCON Management team)

"RBP looks only 6 weeks ahead. We need to get a longer view to able to make the best decision. Ex. what kind of effects the decision causes for a couple next periods. Some kind of risk evaluation for the future deliveries would be good." (NAPCON Management team)

"This clearly slows down the bidding work. Then on the other hand the resources for bidding are given by line managers regardless of what has been assigned to the resources in the sprint. So every bid kickoff starts with "we have not time for this.... or this is only prio 2 so we will see if we have time for this…" … (following translated from Finnish) *In the big picture the direction is on the right track, but it just feels like the needs of sales are very much forgotten."* (Sales & Marketing)

"Bit challenges to sync some common development deadlines between teams." (Team member1)

"Very nice efforts and initiative. In my view, with some further refining we can together get best out of it. Thanks!" (Team member2)

5.2 Analysis

The Rolling business planning for two upcoming iterations at NAPCON starts with Pre-planning meetings, as mentioned before. At these meetings, the managers get together to gather all the information needed to form The Product backlogs properly. Attending the Pre-planning meetings is necessary only for managers, excluding the NAPCON Management team. The results of the second question reveal that participation at the Pre-planning meetings was really good among the respondents on both rounds.

When it comes to the Decision meeting, NAPCON Management team is required to attend because they make the high-level business decisions and prioritizations. Still, it is appropriate for the other managers to attend also so that the plans made in the Pre-

planning meetings can be properly introduced. Based on their responses, the NAPCON Management team's attendance was 100% on both rounds.

The Team members' attendance rates in the Sprint Planning meetings were 61% on the first round and 69% on the second round. Based on the surveys, it cannot be deduced why some Team members did not attend, why some were unaware of the meetings or what was the attendance rate in reality. The Team members' commitment is highly emphasized in Scrum, as it is one of the key aspects for working in self-organizing teams. Attendance rates should be high in the Sprint planning meetings so that all Team members are able to form a mutual understanding of the priorities and tasks for the upcoming Sprint. In addition, the responses do not reveal whether the Product owners attended the Sprint planning meetings or not. According to several responses from the first round the Product backlogs and task prioritizations were quite unclear and this made it more difficult to organize the Sprint backlogs. Scrum states that the Product owners are responsible for the Product backlogs and for that reason they should attend the Sprint planning meetings and help the rest of the Scrum teams to form the Sprint backlogs. On the second round this was not mentioned as an issue anymore, so it can be assumed that corrective actions had already been taken after the first survey.

Another big issue raised in the first survey was the missing input from the Sales & Marketing department. Some technical resource hours were allocated to sales bidding work for the development teams on the first planning round but it was done in a hurry and without knowing the real needs of Sales & Marketing. One Team member noted, that the six-week period is far too long a time when trying to allocate the proper technical hours for Sales. It is true that sometimes it is hard to predict the upcoming sales cases over a longer period of time but with information coming from Sales & Marketing it would be easier. This time, for the first planning round, the inputs came too late and the plans for ad-hoc sales cases and projects were not done. On the second planning round a respondent from the Sales & Marketing noted that Scrum slowed down the bidding work and that it was hard to get the needed resources during the ongoing Sprint. The same person noted that they (Sales & Marketing) were not even invited to the planning meetings and s/he only heard of the plans and decisions afterwards. This clearly shows that communication needs improving and the planning preparations need to be better synchronized with the Sales & Marketing department. The synchronization issues were also noted by the Management team.

Already after two six-week planning rounds, working in a Scrum environment has shown very positive signs of improvement. Many responses brought up the good discussions about business needs and plans, upcoming tasks, priorities and reasons behind the prioritization. Understanding has grown, transparency has improved and participants were able to form a clearer overall picture of the ongoing projects at NAPCON.

Things that still need more attention are the overall efficiency at the meetings and accuracy in work descriptions and prioritizations. In addition, the respondents criticized the unclear planning processes and the tools used. The NAPCON Management team brought up the need for longer-term plans and risk evaluation for future deliveries for making the best decisions. This was also the case at Cisco: they solved the issue by developing a process that enabled them to have a quite accurate, at least six-months' predictability in planning (see page 18; Chen et al. 2016, 6). The challenges in multi-location and multi-customer projects were also mentioned, as well as interdependencies and synchronization of common deadlines between different teams. These issues are mentioned as the more difficult ones according to the case studies introduced in chapter 3 and require further research and work in order to be solved.

The respondents were asked to rate the level of information provided on these planning rounds and to give some improvement ideas. The ratings show that information sharing has increased already, as mentioned earlier, even though there are still issues that need more clarification. The respondents felt that the upper level prioritization and strategy is still unclear and more information is needed about the decisions and the planning phase in general. In addition, further clarification of the roles and responsibilities was asked. In this case a working solution might be similar to the solution at Cisco (see pages 17-18; Chen et al. 2016, 5), where the company set up an internal website to help the engineering teams to learn and adopt the agile practices. An advantage of this solution is that the information can be reviewed later at any time at one centralized place.

The respondents were also asked to rate the success of Rolling business planning rounds. As the results show (Figure 9), the success of the second planning round was slightly better than that of the first round. This can be interpreted as an improvement in the planning process. The interpretation is also supported by the responses to the open-end questions on the second round.

The attitudes among the respondents seem mostly very positive. Over half of the Team members noted already in the first survey that this was a more organized and effective

way of working, the workflow had improved and it was good to know beforehand the tasks for the next three weeks. On the other hand, the responses of both surveys reveal that there is still more work to be done until the Team members' attitudes and minds are shifted completely and they are fully committed to work in an agile way. The attitudes of the managers were even more positive but that might be due to the fact that they already have more knowledge of the situation and the plans per se.

6 CONCLUSION

The focus of this thesis was on a management level transition. The purpose was to monitor the transition of the company's management process from Waterfall model to Agile Scrum methodology and to measure the success of implementing the new working method. The main objective was to identify potential problems in the planning phase during the transition and to make suggestions for further actions to avoid those problems from reappearing.

The research questions in this thesis were

- what are the pain points in implementing new working methods
- is the implementation of the new working method going well and
- what could be done better or differently

Literature and articles were used to examine the main principles of the traditional Waterfall and Agile project management methods and Scrum methodology. Also, case studies were examined to find out what kind of challenges other companies have met during the transition from Waterfall to Agile.

The empirical part of this thesis was based on two online surveys to gather quantitative data. The respondents were allowed to stay anonymous to ensure that the responses were more honest and reliable. The surveys were conducted twice during the first months of the transition. The results showed that while NAPCON had problems with the planning tools and the process was more or less unclear during the first round, they managed to take corrective actions already during the second round. This is how the process should work.

The main findings of the surveys were that the new agile roles and responsibilities need clarifications, and they need to be communicated properly throughout the whole business unit. More attention needs to paid to adopting the new roles as well as the mind shift of the Team members. In addition, the needs of the Sales & Marketing department must be taken into account in future planning. There is a risk that Sales & Marketing turns into a bottleneck just like in the case study of Sulake (see page 21; Friis et al. 2011, 2). Therefore, it is highly recommended to seek a solution on how to include the whole Sales & Marketing department as part of the Agile process.

The quality of the case studies varied quite a lot, but the main research findings were similar: The transition to Agile requires organizational change in the new management environments and practices, the commitment of all managers in helping the teams to adopt the new development process, and a mind shift by the Team members. These findings support the findings of the conducted surveys for this thesis.

The first steps taken in the Agile environment showed a big improvement in the overall communication, and the understanding of the business decisions grew throughout the NAPCON unit. The first round also revealed significant bottlenecks in resources, resulting in recruitment actions as corrective measures. As noted in the Case study of Sulake, Scrum does not solve the problems it just reveals them (see page 21; Friis et al. 2011, 2).

Even though the response rate for the both queries was under 50%, the conducted surveys gave valuable information about the state of the transition, the attitudes and the issues that have surfaced.

Many issues that the surveys revealed can be corrected by making the management level decisions and the reasoning behind them even more transparent, and by sharing the information more efficiently. Also, additional training and coaching support the efforts to adopt the Agile method successfully. Conducting similar surveys also in the future would help to keep track of the state of the adoption process. As mentioned in the previous chapter, the projects in which there are more than one team, customer or location involved, need more research in the near future in order to get these properly included in the Agile working environment.

As mentioned earlier, "The key is to derive valuable learning from the practices and to build a culture of continuous improvement" (Chen et al. 2016, 5).

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NAPCON Agile business operations

The first agile planning phase - how did we managed in practise?

1. **Your role in the organization** *

◯ NAPCON Management team

◯ Line Manager

◯ Project Manager

◯ Product Manager

◯ Team member

2. **Did you participate in** *

	Yes	No, but I should have been there	No, but I was aware about this	No
Rolling business planning pre-meetings	◯	◯	◯	◯
Rolling business planning decision meeting	◯	◯	◯	◯
Sprint planning	◯	◯	◯	◯

3. **What was good in the meetings you participated to?**

_____
_____
_____
_____
_____

4. **What could have been done better or differently in the meetings you participated to?**

_____
_____
_____
_____
_____

5. **The level of information provided at any step** *

	1	2	3	4	5	
Poor	○	○	○	○	○	Exellent

6. **If information provided was not enough, at what point and what kind of information you would like to have more?**

_____

_____

_____

_____

_____

7. **How would you score the success of the first round of rolling business planning?** *

	1	2	3	4	5	
Poor	○	○	○	○	○	Exellent

8. **What kind of impact do you see this change has on your work?** *

Negative	○	○	○	○	○	Positive

9. **Free comments:**

_____

_____

_____

_____

_____