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Improving Business Agility with Upstream Process

Metropolia University of Applied Sciences

Master's Degree

Degree Programme in Business Informatics

Master's Thesis

21.5.2023

Abstract

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Title:	Improving Business Agility with Upstream Process
Number of Pages:	98 pages + 3 appendices
Date:	21 May 2023
Degree:	Master of Business Administration
Degree Programme:	Business Informatics
Instructor:	Antti Hovi, Senior Lecturer

In the context of software development terms upstream and downstream might sound familiar, but many organizations do not understand the difference between them. The upstream focuses discovering selected development ideas or feedbacks, while the downstream is focusing delivery of the selected work items discovered in the upstream. It is inevitable for the organization to have the upstream process, since it can reduce number of available development options by selecting the ones that bring the most value to business and customers.

The case organization of this Thesis is struggling with a constant stream of the development ideas and feedbacks and needs improvements for the upstream process to maintain balance and manage the work on the top of the large funnel of options. Accordingly, the objective of this Thesis is to propose a solution that creates a consistent and visualized stream of ideas and defines stages for their refinement.

Action research methodology is used to conduct the study along with qualitative research with some elements of quantitative analysis. The study was executed by using multiple data collection methods such as interviews, observations, questionnaires, and document analysis. The research design of this Thesis consists of five steps where data is gathered in three data collection rounds.

The study is conducted in three phases. First, the current state of the upstream process in the case organization is investigated and existing pain points are analyzed. Second, the best practices from literature are recognized and third, the proposal building, and validation is executed based on the identified development needs.

The outcome of the Thesis, the final proposal represents the key elements which the case organization can utilize to create a consistent and visualized stream of ideas and defines stages for their refinement. The proposal defines the four key elements that are crucial to improve the upstream process: visualizing ideas and process steps, limiting work-in-progress, creating explicit policies, and improving collaboration. By executing the proposed improvements, the case organization approaches towards business agility.

Keywords: Agile, Business Agility, Upstream Process, Kanban, Scaled Agile Framework, flow of work

Preface

Working with this Thesis has been extremely interesting, educational, rewarding, and insightful, but at the time also challenging and exhausting. I have truly enjoyed exploring the different aspects of the research topic. Working with different people inside the case company has provided opportunity to build valuable connections and network with the experts across the different business areas.

As part of my long-time goal to achieve Master's Degree, the journey of this Thesis started during the fall 2022. Daily struggles with this practical problem in the case organization provided an idea for the Thesis and the final delineation of the topic was done by end of the year 2022. This Thesis proposes the improvements how the case organization can better manage a constant stream of the development requests and the work on top of them. The proposal provides framework, that to the case organization and other organizations or teams can utilize to improve business agility.

First, I want to thank my employer DNA Ltd, the company where I have been working the past 13 years. The company is a true innovator and business forerunner, who has been utilizing agile for a long time. It was pleasure to do this Thesis for the case organization and give them opportunity to achieve the next level of business agility with the proposed improvements. Thank you to all my colleagues, my supervisor, and the stakeholders whose input and support have been crucial in terms of the success of this Thesis.

I like also to thank Metropolia University of Applied Sciences and especially the Senior Lecturer Antti Hovi, for guidance and support throughout the journey. Thank you Zinaida Grabovskaia, PhL, for your insightful comments and feedbacks that gave me opportunity to improve this Thesis. Finally, I want to thank my spouse, family and friends for flexibility, patience, and support during this journey. Thanks for understanding how important this work was for me.

Anna Auvinen
Lahti
21th May 2023

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Glossary

Agile	Project management methodology that is often used in software development. Agile utilizes a core set of values and principles. Continuous development is done incrementally through the small and frequent releases.
Agile Release Train	ART means Agile teams that continuously are developing and delivering the solutions.
Agility	Ability to quickly respond to change.
BSS	Business Support System. Enables handling of orders, products, billing and customer relations.
Business Agility	Organization wide capability that enables business to adapt market changes and deliver value through agile organizational processes.
Kanban	Visual method for managing workflows in the individual, team and organization level. Kanban visualizes how actual work is passing through the process.
Upstream Kanban	The application of Kanban where development ideas can be stored and advantageous work done in the context of innovation.
SAFe	Scaled Agile Framework. World’s leading framework that helps companies to deliver products and services faster, more predictably and with high quality.
WIP Limit	Work In Progress Limit. Policy that set maximum amount of work that can exist of each status of workflow.

1 Introduction

Over the past decades different agile methods have enabled excellent success rates in software development. Agile way of working has improved quality, speeded up time-to-market and effected significantly to motivation and productivity of the development teams. Agile methods are not anymore only common way of working in the software development thus methods are spreading across the various industries. (Darrell et al., 2016). The case company of this Thesis has identified agile development to be one of the key assets that will help company towards to its vision and strategic goals. With agility, company aims to have ability across the entire organization to respond change with quickly, boldly and straightforwardly.

Challenge in the case organization is that, even though well-established agile processes are delivering value via new products and features to customers and end users by translating output to an outcome, the case organization is overwhelmed by feedbacks and development ideas. Constant stream of the requests is coming in and it is difficult to maintain balance and manage the work on the top of the large funnel of options. It is crucial to be able to reduce available options by selecting initiatives that gives the greater value to the customers and end users.

To tackle this challenge, this Thesis focuses on improving business agility with upstream process to better manage the stream of incoming requests before being able to commit the work for execution in agile downstream. Upstream focuses discovering selected development ideas or feedbacks, while downstream is focusing delivery of the selected work items discovered in upstream. With the excellent upstream process the case organization can build continuous flow to development pipeline and that way reach a new level of business agility.

1.1 Business Context

The case company of this thesis is one of the leading Finnish telecommunication companies, DNA Plc. DNA is providing high quality voice, data and TV services for communication, entertainment and work. The company aims to have the most satisfied customers in Finland and in accordance with their values company promises to be fast,

bold and straightforward in all their action. Their customer promise is carefree living, what means that the company makes customer's life uncomplicated now and in the future. For the corporate customers, the company is described on its website as follows,

> "..to be a pioneer in new ways of working. DNA wants to create the many possibilities of digitalization together with its customers. Our professional service is built on a genuine interest to the customer's business, an excellent service attitude and uncompromising professionalism". (DNA Oyj, 2021, DNA as a company).

The company has had strong development and increased market shares year after year. The company has own national mobile and fixed network and it is Finland's largest cable operator. Presently, the company has over four million mobile and fixed-network subscribers and is employing over 1600 people. The company was established in 2001 and is today part of Telenor Group. The company's net sale in 2020 was 934 million euros and the comparable operating income 151 million.

The company is a strong partner for companies, public corporations and integrators. The company's high-quality networks are playing increasingly important role in the ecosystem of machines, information and people as the volume of data traffic is increasing. The case organization of this thesis is an internal business unit that is delivering and maintaining services for all sizes of corporate customers. Core responsibility for business unit is to provide product and services to corporate customers end-to-end in co-operation with other Corporate Business operations as well as with technology and IT departments.

1.2 Business Challenge, Objective and Outcome

The case organization has taken in use the new Business Support System (BSS) with aim to have improved automation and enhanced delivering and maintenance capabilities in the long term. System has been taken in use with Minimum Viable Product (MVP) and development continues incrementally. The case organization needs to continuously develop BSS to support modern delivery methods and enhanced maintenance capabilities to meet customer expectations.

Currently, the case organization is experiencing challenges due to a constant stream of the development ideas and feedbacks regarding the BSS that is coming in, which makes it difficult to maintain balance and manage the work on the top of the large funnel of options. A more systematic approach and process is needed how to manage incoming requests, how to store them to guarantee transparency and monitoring possibilities and how to refine the ideas and to prioritize them to actual implementation.

Accordingly, the objective of this Thesis is *to propose the solution that creates a consistent and visualized stream of ideas and defines the stages for their refinement.* The outcome of this Thesis is a proposal for the upstream process that creates a consistent and visualized stream of ideas and defines the stages for their refinement.

1.3 Thesis Outline

The scope of the thesis is to develop a proposal for the upstream process, i.e. a solution that creates a consistent and visualized stream of ideas and defines the stages of their refinement.

This thesis includes seven sections. Section 1 introduces the topic and the business context, business challenge, objective and outcome of the thesis. Methods and materials used in this Thesis are described in Section 2. Section 3 presents the results from the current state analysis, including the questions how development ideas are currently collected and managed in the organization before they are prioritized to actual implementation. Section 3 gives the overall picture what kind of the upstream process the case organization is currently following. Section 4 discusses the existing knowledge and best practices on the topic of the Thesis. Section 5 presents the initial proposal for the upstream process plan that can support the organization's business agility. The upstream process is developed together with the organization´s stakeholders based on the findings from the current state as well as from literature review and best practices identified in Section 4. This proposal creates a process for a consistent and visualized stream of ideas and defines the stages for their refinement. Section 6 reports on the results of validation of this initial proposal and presents the final proposal as well as action plan for the proposal’s implementation. Section 7 includes an executive summary and thesis evaluation.

2 Method and Material

This section describes the research approach, research design, and data collection as well as analysis for methods used in this thesis.

2.1 Research Approach

Research can be described as a systematic process inquiry or investigation that is aiming to discover new facts and findings. It consists of collection of different data: interpretation of facts, revision and analysis of existing theories in the light of new facts or practical ideas and documentation of critical information. Fundamentally, research aims to enhance the existing knowledge, to extend that about the aspects of the topic which people know little and enable them better to understand the subject. (Adams et al., 2014: 1-2.)

First, *a research family* can be applied or basic. Basic research focuses on collecting information and data to understand subject or phenomenon, while applied research uses the existing knowledge, facts, and findings to build the new knowledge. Applied research focuses on solving practical problems that exist and its outcomes are solution driven. (Sauders 2019, 43-45.)

Second, *research methods* can be quantitative, qualitative, or mixed. Quantitative research methods use numerical or statistical data analysis tools such as questionnaires, graphs, or statistics. Quantitative research methods utilize non-numeric data and data analysis tools such as interviews, images, audio recording or other similar. Mixed research methods combine this both elements. (Sauders 2019, 269-270.)

Third, *a research strategy* can be described as the plan how the researcher is going to answer research questions. The objective and research questions guide selection of the proper strategy. The examples of quantitative research strategies are experiment and survey, which can be conducted through questionnaires or structured interviews. Main strategies of qualitative research are Action Research, Case Study, Ethnography, Grounded Theory and Narrative Inquiry. Qualitative data collection can involve for example interviews, observations, or content analysis. In action research, organizational problems, that people are experiencing is solved through collaborative process.

Participation is an important part of the research, where engaging people with the set of actions is gaining better understanding of complex problems and providing high quality solutions. (Sauders 2019, 292-293.)

In this study, the selected research strategy that bests fits the Thesis subject is Applied action research. Applied action research tackles practical problems and everyday issues with view to improving the quality of action within it. Applied action research is oriented for the change instead of just gathering knowledge and it focuses creating the solutions to identified practical problems. (Adams et al., 2014: 7.)

In this Thesis, both qualitative and some elements of quantitative methods are used to analyse how satisfied the case organization's employees are with the current upstream process and what development recommendations they have. The qualitive methods used in this study include interviews which explore how internal stakeholders meaning representatives of the case organization are seeing the current upstream process and which are its pros and cons. The interviews also include external stakeholders' discussions to benchmark the best policies and practices from other business units in the case company and identify their key elements so that a continuously developed pipeline can be created. The other methods include a survey for employees, analysis of internal documents and participant observations.

2.2 Research Design

The research design of this Thesis consists of five steps that can be seen in Figure 1. The research design is supported by three different data collection phases.

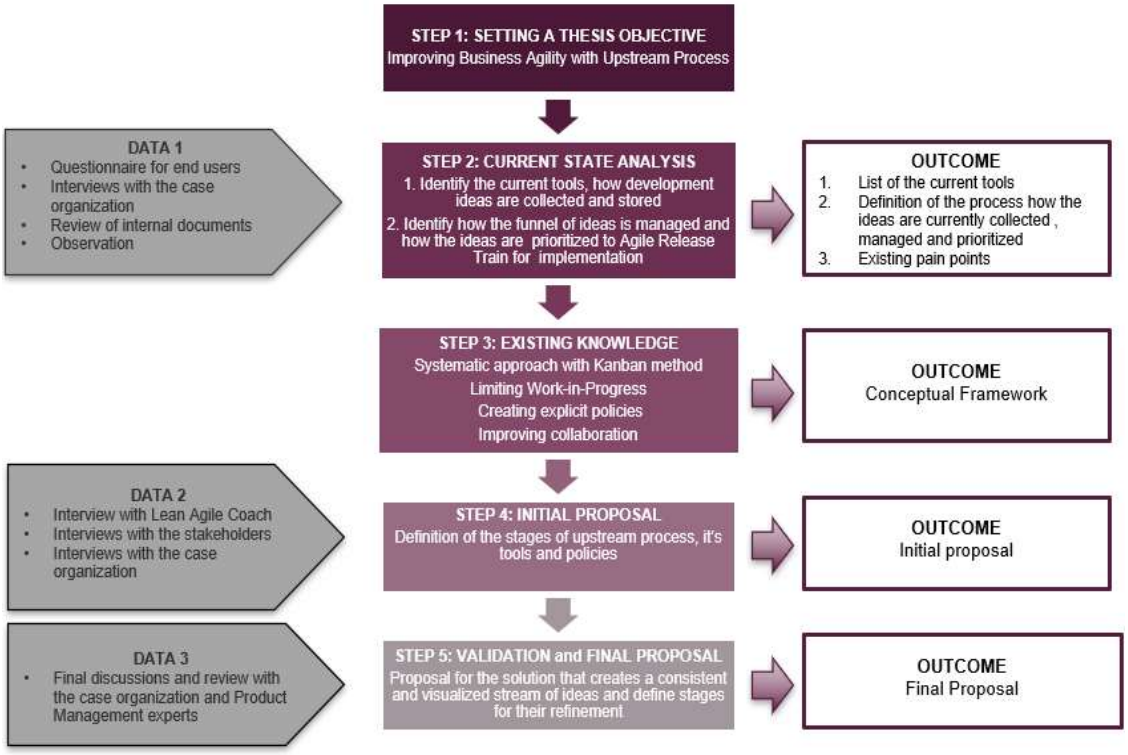

Figure 1. Research design of this Thesis.

The first step of the research design sets the objective to develop a proposal for the upstream process that can improve a business agility in the case organization. The second step is the current state analysis which identifies the existing tools and ways to collect and store the development ideas. The current state analysis is based on Data 1 collection, which also focuses to identify how the funnel of ideas is managed and how the ideas are prioritized from the upstream to Agile Release Train (ART) for implementation. The current state analysis is based on the end user survey, interviews with the case organization representatives, internal documentation analysis and observations. The intention of this step is to understand the disadvantages of the process that the case organization is currently using and identify the requirements and needs for the new process.

The third step investigates the existing knowledge and best practice on the topic of the Thesis. Based on the selected ideas from literature and best practices around the upstream process, the conceptual framework is created. The fourth step focuses on co-creating initial proposal. Data 2 collection is executed through interviews with the case organization's representers and the stakeholders. The initial proposal is based on the results of the current state analysis, the findings from existing knowledge and best

practise, and a new round of elaboration with the case organization's representers and the stakeholders.

The final step is validation of the proposal which results in the final proposal for the upstream process, i.e. the solution that creates consistent and visualized stream of ideas and defines the stages for their refinement. Data 3 collection includes the final discussions and review of the proposal with the case organization representatives and the experts from other business unit.

2.3 Data Collection and Analysis

In this study data have been collected from several data sources. Table 1 shows details of Data collections 1-3 used in this study.

Table 1. Details of Data collections 1-3 used in this study.

Month and year	Respondent	Data collection approach	Operational definition	Documentation
DATA 1: CURRENT STATE ANALYSIS				
January 2023	Employees of the business unit	Survey	The current state feedback, the new requirements and expectations	Webropol Web Survey
February 2023	Process Specialists (3)	Interview	Identifying disadvantages of the current model and expectations for the new upstream process	Field Notes, Miro
February 2023	Senior Specialists (3)	Interview	Identifying disadvantages of the current model and expectations for the new upstream process	Field Notes, Miro
February 2023	Supervisor (2)	Interviews	Understanding the current responsibilities and workload	Field Notes, Miro
February 2023	Head of the Department (1)	Interview	Understanding the upstream process and its disadvantages	Field Notes, Miro
February 2023	Review	Internal documents	Investigating the current roles, responsibilities and ways how different departments are executing upstream process	Field Notes, Miro
January to March		Observation	Analysis for the utilization of the current upstream process and its tools	
DATA 2: INITIAL PROPOSAL				
April 2023	Lean Agile Coach, Product Management (3)	Interview	Benchmarking best practises from SAFe Framework	Notes, Miro
April 2023	The stakeholders from other business units (3)	Interview	Benchmarking best practices from other business units	Notes, Miro
April 2023	The case organization representers (2)	Interview	Co-creation for initial proposal	Notes, Miro
DATA 3: VALIDATION AND FINAL PROPOSAL				
May 2023	Specialists, Development Manager, Head of Departments, Vice President, Product Management experts	Discussion, Review	Validation, evaluation and finalization	Notes, Miro, Recording

As seen from Table 1, data for this Thesis was collected in three data collection rounds, and the interviews made the primary method of data collection. The interviews were conducted as semi-structured, one-to-one interviews as well as workshop interviews, held on the Teams and company's head office with questions created in advance. Field notes were made for each of the interview and workshop.

In the first part of the data collection (Data 1), data was collected and analysed for the current state analysis in the case organization via the survey with end users and interviews with representatives in specialist and manager roles. The current documentation regarding agile development and agile teams in the organization level was also gathered and analysed. In addition to this, the current process and its tools was analysed via observation.

The aim of the survey was to investigate how satisfied the end users are with the current development model and process. Users answered questions such as awareness about the channels where feedback can be given regarding the BSS and related processes; where they do get enough information on how their ideas are proceeding in development pipeline, etc. The questions for the survey can be found in Appendix 1.

The interviews defined the status how the funnel is used and how the development ideas are currently gathered, stored and managed before they are pulled to Agile Release Train for implementation. The interviewees represented various positions on the specialist and managerial level, working directly or indirectly in the development activities. The interviewees were chosen based on their ability to provide experienced and key insights regarding the current process. From the interviews important information was obtained regarding the biggest challenges and development needs in the current process. The checklist of the topics for the interviews (Data 1) can be found in Appendix 2.

In the second part of the data collection (Data 2) round, data was collected through interviews with the case organization's representatives and the key stakeholders to gather suggestion for the initial proposal. This data included one-to-one and group interviews. The purpose of interviewing the stakeholders was to collect functional ideas via benchmarking. The discussions with case organization's representatives were arranged to get the final requirements and input for the initial proposal. The checklist of the topics for the interviews (Data 2) can be found in Appendix 3.

In the third part of data collection (Data 3) round, data was collected when conducting validation of the initial proposal. Data 3 included the final feedback for the proposal from the case organization's representers and two other key stakeholders. First, the proposal was validated with the case organization's representers, and second validation was executed with the Product Management experts. Feedback and recommendations were put into practice in the final proposal building.

The textual data from data collection rounds 1-3 was analyzed using a thematic analysis. Table 2 provides an overview to the internal documents analyzed in this study.

Table 2. Internal documents used in the current state analysis, Data 1.

	Name of the document	Number of pages/other content	Description
A	DNA Agile Playbook	25 pages	Instructions for improving work
B	Basics of lean and agile development and introduction to SAfe	7 instruction videos, total 1,5 hours	What agile development means and how agile teams work
C	Product Lifecycle Management process for development work	7 slides	User guide for developers
D	User satisfaction survey results from 2021-2022	4 surveys, 30 slides	End-user survey to investigate user satisfaction for current processes and tools

As seen from Table 2, this study analyzed a number of internal documents. The main documents included instruction materials regarding agile development, agile way of working and building agile teams. The documents also included old results from the user satisfaction surveys that were executed during years to 2021 and 2022 to investigate employee's satisfaction for the BSS and related processes in the case organization. All the documents were analyzed for Data collection 1 round, the current state analysis, to get better understanding and insights about the business challenge as well as explore feedbacks received earlier from the case organization's employees.

The biggest part of data was analyzed for the current state analysis, to establish the current state of the upstream process. The findings from the current state analysis are discussed in Section 3 below.

3 Current State Analysis of Upstream Process in the Case Organization

This section discusses the results of the current state analysis, how a constant stream of development requests is coming in and managed in the case organization. The current state analysis focuses understanding the current ways of working and ends with the strengths and the weaknesses of the upstream process and a summary of the key findings.

3.1 Overview of the Current State Analysis

The current state analysis aims to give a comprehensive perspective of the current upstream process in the case organization, where this process enables development of the one main BSS.

The current state analysis was conducted in four steps and analysis was produced based on the data received from the end user survey, the interviews with the case organization´s representatives, participant observations, and analysis of internal documents.

First, the current state analysis gives an overview of the current upstream process, the parties involved and helps to understand and explore the overall process flow, its roles and responsibilities as well as used tools. Second, the current ways of working are analyzed from the system end users, specialists and supervisors' points of view. Fourth, strengths and weaknesses and other findings of the current process are identified based on the information collected in Data 1 round.

3.2 Description of Upstream Process in the Case Organization

The current upstream process used in the case organization was analyzed via end user survey, conversations with the case organization's representatives, observing the participants working currently in the process activities, and reviewing existing internal documentation. The current state of the upstream process is visualized in Figure 2.

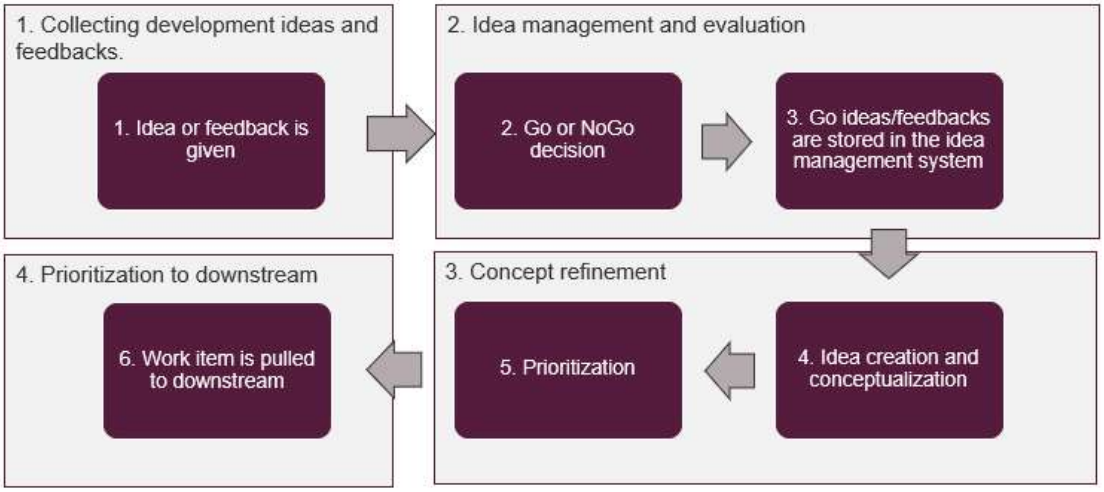

Figure 2. The current upstream process for BSS development in the case organization.

As seen from Figure 2, the current state includes six steps in total, and it will be described in four stages, which represents also following sub-sections. First stage explains how development ideas and feedbacks are currently collected and how aware the case organization representatives are about current channels. Second stage focuses how decisions about development items are made and what idea management system the case organization uses for storing all development ideas and feedbacks. Third stage describes how ideas become concepts and how they are refined during the upstream process. Fourth stage clarifies prioritization decisions and how concepted development needs are pulled downstream process to be prepared and further designed for actual implementation.

3.2.1 Collecting development ideas and feedback

Development ideas and feedbacks are currently collected in two different ways. The case organization uses Microsoft Teams as a communication tool and have shared channel where development ideas and feedbacks can be given. They are leaved to the forum by the case organization representatives with name included and supervisors are following channel and tagging Development Managers to the discussions on their area of responsibility. In the shared channel called “idea forum”, people can leave ideas and feedbacks regarding any system, process or product. Another option to give feedback is via a webform, where people can leave anonymous development ideas and feedbacks regarding only this specific BSS. The current channels are mostly well known by the case

organization representatives. 75 employees of the business unit responded to the end user survey which asked how aware they are about the channels where feedback or development ideas can be given. 66,7 percent of respondents were familiar with the current channels.

According to some interviewed persons, using one specific channel for feedbacks would bring clarity, but some thought that having an option to give feedback either under own name or anonymously is good. The option to give feedback via a webform was launched recently. Before that many of the ideas went through specialists to Development Manager, which was regarded as poor practice and lot of feedback was not recorded properly. One of the Process Specialist describes situation before webform:

> The channel for giving feedback is clear. Employees of my department are using the webform. Before the webform was launched channel where to give ideas and feedbacks was not clear at all. Feedbacks were given to Process Specialists who provided them to Development Manager. *(Process Specialist A)*

Since the webform is a new channel for the ideas and feedbacks, awareness about it among the case organization must be increased. Both feedback channels, the idea forum and the webform, are mentioned in the BSS instructions in intranet to help the end users find the correct place. It also depends on the end user does they want to use the official channels for giving feedback, or will they rather give feedback to some of the specialist to provide it further. Senior Specialist A highlights that:

> To my department it is not crystal clear, what is the correct channel for the feedbacks and development ideas. Mostly people are trying to provide it through Senior Specialist or Process Specialist. Official channels are used rarely, even though people are aware of them. *(Senior Specialist A)*

The respondents believe that it is a challenge to centralize development ideas and feedbacks to a single forum, because the departments inside the case organization are using different channels and tools. Beside Teams forum and webform, responsible Development Manager is receiving random feedbacks regarding BSS via Teams conversations, emails and in different internal meetings.

3.2.2 Idea management and evaluation

After development idea or feedback is given to one of the existing channels, the responsible Development Manager shortly investigates that is the idea or feedback valid and is there also other similar needs identified earlier regarding topic. The potential new ideas and feedbacks are stored to the idea management system after a quick analysis by Development Manager. In the quick analysis, Development Manager makes decision is the proposed item worth for the development. Also, duplicate items are identified at this stage.

Previously, there was no common place for feedbacks and ideas. They were maintained in emails, excel sheets, and notepads. In addition to this, some of the ideas were straight logged into the downstream Kanban. At the end of the year 2022, just before interviews were performed, ideas and feedbacks from multiple different places were moved to the common Mural board. Mural is an online collaboration tool that can visualize content to the needed stakeholders. The case company has decided to use Mural as a tool across organizations, as it was an obvious choice for this purpose as well. This board is used only by Development Managers and Process Specialists of the case organization. In the interviews, people who haven't access to the Mural board were ignorant of the place were feedbacks and ideas are stored. All interviewees agreed that, beside Development Manager and Process Specialists, all the case organization's representatives working in the specialist position should know the place were ideas and feedbacks are stored with the ability to view them when needed. It was also highlighted that not all employees need to see Mural board, as it is more tool for people in the specialist positions. Process Specialist B described the need to see the board in the business unit as follows:

> Employees of our department are not aware were these ideas and feedbacks are stored. It is not even relevant for everybody to access to the Mural board. Employees can make conclusions about things that can be wrong. Their ability to understand way of working with development items is limited because they do not know the framework of development. *(Process Specialist B)*

In general, the Mural board was felt to be a good place to maintain feedback and development ideas, but since there can be a lot of feedback and development items, people were also worried about the scalability of the tool. When the current Mural board was displayed during the interviews, some of the interviewees who hadn´t seen this before felt that some short instructions and a walk-through would be needed to

understand how ideas and feedbacks are progressing on the board. As one of the Process Specialists expressed:

> Even it is possible to access to the Mural board, checking something there is difficult. Development ideas are there in the subject-level, but more detailed information is missing. Duplicate ideas are coming easily when description is missing. Also, because pool of the ideas is so large it would be good idea to divide them in the categories. *(Process Specialist C)*

In the current situation, development ideas are available in the Mural board or in downstream Kanban. The new development ideas are always logged into the Mural, but downstream Kanban has also a huge funnel of items that have been created there earlier. Process Specialist C encapsulated:

> If I need to check is this development idea already logged or I need to check what is the status of some development item, I cannot figure it out myself. I need to ask help from Development Manager *(Process Specialist C)*

The challenge in the current idea management process is that, if somebody need to check is there already logged development request regarding some topic, employees need to check first the Mural board then the downstream Kanban. This is very time consuming; moreover, from Kanban it is not easy to find any information for the employees who are not using the Kanban on a daily basis.

3.2.3 Concept refinement

After the development ideas are collected and stored in the Mural board, further analysis of the need and concept refinement is done by the responsible Development Manager. Development Manager is identifying the ideas that are the most relevant and bring business value to the end users and customers. When the most important items are recognized, the needed work item ticket is created to downstream Kanban according to the Scaled Agile framework. Concept and acceptance criteria of the development item is specified by Development Manager if she has the knowledge to do it by herself. In larger development entities, an internal discussion is held with Process Specialists and other the case organization’s representatives.

All interviewed specialist agreed that the discussion and ideas to be developed should be elaborated together much more. Process Specialists A explained the current state where is lack of discussions:

> We should more often together follow and walkthrough development items in the funnel and together discuss what are the most relevant items to take further analysis and hand over to downstream. Of course, if the item is simple, discussions are not needed that much. For the bigger entities we have hold discussions, but it has not been systematic. *(Process Specialist A)*

If the discussion and concept refinement has been done together, the discussions are mostly held between Development Manager and Process Specialists. Based on the feedback from interviewees, more the case organization representatives should participate to the discussions, especially to give more information from the end user view and to identify possible pain points relating the matter under discussion. Senior Specialist B described this need:

> Employees who are using the system in daily basis and who are working in customer interface should be included in the decision-making which development ideas should be taken in the further implementation. Also, it is important to involve these people in the concept refinement discussions. In general people working in the different positions should be included in the different stages of the upstream process. *(Senior Specialist B).*

In summary, Process Specialists have been every now and then involved in the elaboration of the development ideas but for them as well as for the other interviewed persons it was mostly unclear how the development ideas are handled before they progress to the downstream for implementation.

3.2.4 Prioritization to downstream process

Based on the SAFe model, during the concept refinement work item tickets are created and after requirements are clear, they are ready to pull to the downstream process. The case organization needs to make decisions what items are prioritized to the downstream process since development capacity is very limited. Development Manager is responsible for the prioritization. Items are prioritized based on the business value they are giving to the system´s end user or to the end customer.

Responsible Development Manager is preparing a list of items that she thinks are important for the case organization to enhance. Some of the items are coming from the other business units or development teams and are “must-do” items because of the dependencies between different systems. Development Manager walks the draft plan of the development items through with the case organization’s Process Specialists that are

representing two different departments. One department´s lead is participating to the draft plan reviews as well.

Process Specialists can decide on prioritization, and if there has been some urgency brough up, they have been heard. This is illustrated by interviewed Process Specialist A:

> I feel like I have been able to affect the prioritization, I think we are having a lot of conversations regarding them. If I have disagreed for some of the proposed development item, I have been heard regardless of whether my request went through or not. *(Process Specialist A)*

Several issues were raised by the respondents regarding the current model. Since the draft plan for the prioritized items is prepared by Development Manager, people who are accepting the plan are not aware of all available choices. There is no regular discussion about the development ideas on the funnel or backlog, so remembering the options is a challenge. Currently, there is approximately over a hundred development items in the funnel and dozens of features in the backlog waiting for prioritization. One of the main purposes of the Program backlog is be short and responsive, so that they are easy to manage. When the backlog has too many items, they cannot be responded quickly and the backlog is behaving like a queue, that is not purpose. A huge backlog is one of the biggest bottle necks in the current process, not only from prioritization point of view, but also in general.

Critical feedback was also given by the respondents on the velocity of development. The items that Department lead or Process Specialists highlighted as critical items were not developed as expected or according to the schedule that they were expected to follow. These happens due the issues in the downstream process. Even though the case organization prioritize some specific work it, developing the item might take multiple Program Increments, or because of the complexity of the item, all requests cannot be fulfilled.

3.2.5 Roles and responsibilities

The current upstream process is strongly driven by Development Manager. Development Manager gathers ideas and feedbacks and have planned the channels where they can be given. Development Manager decides which items are accepted to the further

development and which are rejected. She is also responsible about storing the items in the idea management system, currently the Mural.

After development ideas are stored, Development Manager gathers the needed information regarding the items among the case organization's representatives and other stakeholders. This is mostly done when a development item is a larger entity. For the smaller items, further information is not gathered, and items are not further discussed.

In the draft plan reviews, the case organization is together discussing which development items are handed over to downstream and Agile Release Trains to implementation. Development Manager drives and is responsible for every stage of the current upstream process and it is strongly depended on her actions.

3.3 Analysis and Key Findings from the Current State Analysis

Analysis of the current upstream process has been done through the end user survey and interviews with ten stakeholders working in the case organization. Six out of the ten people are working in the specialist positions, two in the supervisor positions, and two interviewees were the Heads of Departments. The analysis first, analyzes the end users experience, followed by the specialist's way of working experience based on their interviews, and finally it focuses on the supervisors´ and Head of the Departments´ experience and knowledge about the current model.

3.3.1 System end users' experience

The end user survey investigated the overall user satisfaction with the current BSS to understand how much development is needed for the system and how crucial it is to improve agility and velocity with a better upstream process. Another goal was to get understanding how aware the end users are about the channels where they can give feedbacks and development ideas, do they get enough information about development progress and schedules, and have their ideas were considered and taken into the development pipeline. In the specialists´ interviews, supervisors and department heads provided their view about the satisfaction of end users regarding the current upstream process.

Overall, the user satisfaction with the system was measured via the New Promotor Score (NPS) and Customer Effort Score (CES) metrics. The highest possible NPS metric was 100 and CES metric 7. CES was measured on the scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Figure 3 and Figure 4 below shows distribution of CES and NPS responses.

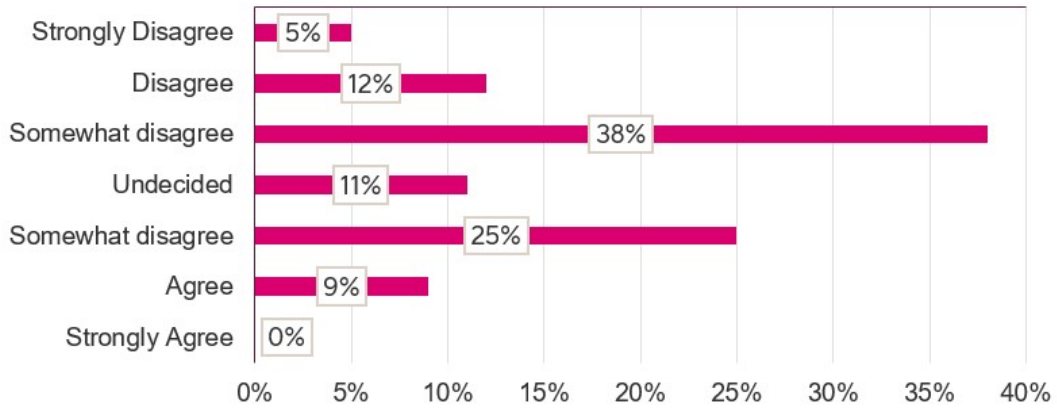

Figure 3. End users answers for effortless usage of the BSS.

Detractors							Passives		Promoters	
0	1	2	3	4	5	6	7	8	9	10
			n = 40				n = 34		n = 1	
			53,4%				45,3%		1,3%	
1	4	1	7	7	6	14	23	11		1
1,3%	5,4%	1,3%	9,3%	9,3%	8,0%	18,7%	30,7%	14,7%	,0%	1,3%

Figure 4. End uses answers for NPS questions.

In the CES question, the end users evaluated how effortless they feel the usage of the BSS is. In general, the end users felt that there have been improvements in the system, but some crucial functionalities have been in the development pipeline for a long time. Overall, average NPS was 52 and average CES 3,67.

To the end users, the most important part of the upstream process is that they know the channels where to provide feedback and development ideas. Figure 5 below shows how the responses were distributed when the end users were asked about the channels

where to give feedback, getting information about development process, and feeling that their ideas have been considered.

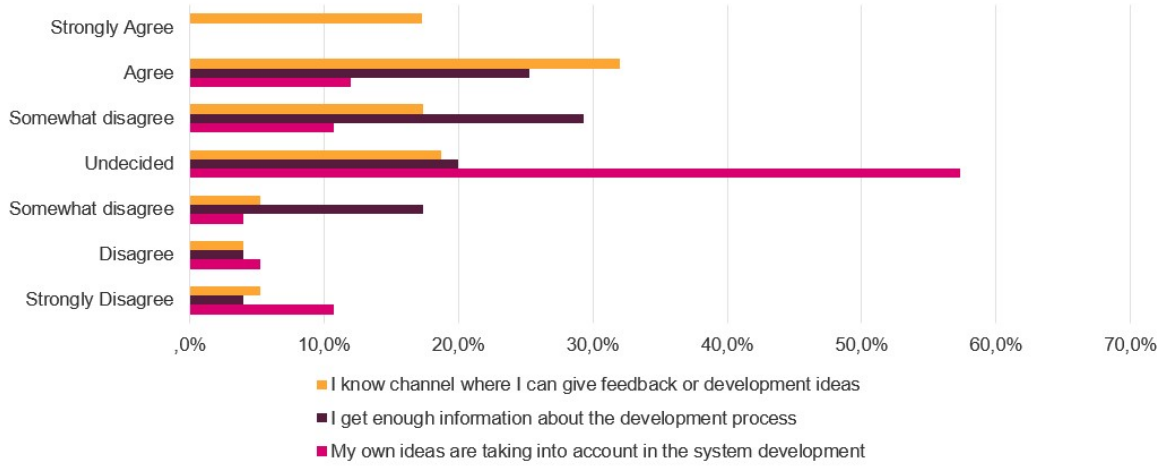

Figure 5. End user's the knowledge for the current feedback channels, information sharing and impact on development.

As seen in Figure 5, based on the results, 67 percent of the 75 employees who answered the end user survey had knowledge about the channels, where to give feedback and ideas. 23 percent of the respondents though that their feedback was considered in the system development, but 57 percent could not agree or disagreed that their ideas were taken into the development pipeline. This points out that transparency of the development is missing, and even though the end users are giving feedback, they might be uncertain what happens to those feedbacks, and if their ideas really be developed. Missing transparency was also brought up in the interviews. Supervisor A encapsulated that:

> Regular reviews are needed where end users can see what kind of development items are in the funnels, what items are already proceeded to the analysis stage and what development items are prioritized in the Agile Release Trains. *(Supervisor A)*

In addition to the transparency, many of the interviewees highlighted that the end users should be included into the discussions where the ideas are analyzed, and concepts are refined. The worry is that Development Managers and Process Specialists might not have enough substance to identify all the development needs related to the subject area.

3.3.2 Specialists' way of working experience

Six specialists from two different departments answered to the following subject areas in order to analyze their experience of the current upstream process flow and identify the issues and developments needs in the working model: namely, their own and their departments´ end users experience about the channels where feedback and development ideas can be provided, their knowledge how development ideas are accepted or rejected, their experience about idea management system, their experience about concept refinement and their experience and knowledge about the prioritization. Also, they were asked how aware the specialists were as for what happens to the development items when they are pulled to the downstream.

First, the specialists had good understanding about the channels where the feedback and ideas are given, and many of them had received feedbacks from the end users and directed them to the correct channels. However, their wish was to centralize the feedbacks and development ideas into one channel.

Second, the decisions which development ideas can be proceed further and which are rejected were unclear for the specialists, and the current way of working was not perceived as acceptable. The specialists wanted to be involved in the decision making. One of the Process Specialist described current situation:

> I haven't been able to affect Go and NoGo decisions. I think more clearance is needed for the decision making. It would be also important to identify when we are doing Go decision, what is the importance of the development idea. These can be done in very general for example ranking them in the three categories high, medium and low. *(Process Specialist B)*

Third, Process Specialists knew that feedbacks and ideas are stored in the Mural board, and it is currently an idea management system. The senior specialists did not know where the ideas are stored and hoped for more transparency. The Mural board was shown to the specialists in the interviews, and good feedback was given for its visualization. All the specialists felt that access to the board is crucial to them, so that they can support the case organization and, for example, easily check whether some development idea exists or what is status of some specific idea. At the same time, access to the board should be kept in the smaller group and specialists did not feel necessary to allow everyone working in the case organization to access an idea management system.

Fourth, the biggest improvement was proposed to the concept refinement stage. More diverse participants are needed for discussions. Especially the senior specialists and the end users should be included to discussions. The BSS is developed for the end users to guarantee that they get their job done as efficiently as possible and it can serve customers in the best possible way. It is very important and essential, therefore, that they involved into the concept refinement stage when the ideas are analyzed on a deeper level. All the specialists also wished for more regular and systematic discussions around the development items. At the same time, it was brought up by the specialists that even though the discussions are important, it also important to understand that larger discussions are not needed with the simplest items.

Fifth, opinions regarding prioritization of the development items were dissenting. Some of the specialists felt that they have been able to affect the prioritization, but mostly prioritization was felt to be beyond their reach. Few of the interviewees pointed out that to be able to participate in prioritizations, employees need to have needed knowledge about the possible options, meaning development items in the funnel and backlog. The senior specialists who weren't involved in the discussions regarding prioritizations proposed to have a variety of the people from different positions involved. One of interviewees also highlighted as follows:

> Absolutely the senior specialists representing their department should be included to the prioritization discussions. Senior specialists whom main jobs are to support end users on their daily work have the best knowledge what are end users' needs and biggest paint points. *(Senior Specialist C)*

It was also unclear to some of the interviewees, why some of the new development items mostly raised outside the business unit are getting prioritized, even though there are plenty of other items on the funnel. Especially Process Specialists who have been part of the prioritization discussions suggested that all the items should be discussed together, despite the fact that the development item was proposed by the business unit or is it coming outside of the case organization. This would gain understanding why some of the new items, which do not appear important to the specialists, get straight to the downstream.

Sixth, the downstream process and how development items are proceeding into the Agile Release Trains was mostly unclear for the specialists. A few of the specialists who participate more in the development activities had better understanding on the high level.

But all the respondents agreed that more information regarding SAFe-model and Agile Release Trains procedures need to be shared.

To sum up, the specialists' experiences regarding the current upstream process are partly good, but they request better systematicity and regularity to make the process more efficient. The biggest pain points related to the lack of the discussions in the concept refinement stage. Also, more walk-throughs are needed so that the specialists are staying up to date about the development items in the funnel and they can support prioritizations. Thus, transparency to development and access to an idea management system are crucial to employees in the specialists' positions. Currently, Process Specialist are mostly involved in the development activities, but it was addressed during the interviews that, if the Senior Specialist level could participate more in the upstream process, this would also help the workload of the Process Specialists.

3.3.3 Supervisors´ and Head of Departments´ views

Two supervisors and two department heads answered to the following subject areas in order to analyze their experience and knowledge about the current upstream process flow and identify possible developments needs in the working model: namely, their own and their departments´ representatives' experience about the channels where feedback and development ideas can be provided, their knowledge how development ideas are accepted or rejected, their knowledge about the idea management system and concept refinement, and their experience and knowledge about the prioritization. Also, their opinion was asked about who and at which stages of the upstream the stakeholders from the case organization should participate.

First, the interviewees felt that their departments are mostly aware of the channels were feedback and development ideas can be given. Beside the official channels, the ideas and feedbacks are also given to the Specialists for taking them further. The current channels were perceived as working well. The Specialists receiving the development ideas were considered to be a good thing, because they often have enough information to assess whether the ideas already exist and whether they are relevant. The visibility of the ideas was brought up as one problem, and one of Heads of the Department concluded it as follows:

> Channels where feedback and ideas should be given are not a problem. The problem is that end users do not have visibility, what has already been proposed and whether the development ideas are relevant. *(Head of the Department A)*

Second, it was not clear to the supervisors and department heads how development ideas are accepted or rejected, and they agreed that it is not clear for all the end users and specialists working in the case organization either. The interviewees did not think it was even necessary that the entire case organization should be aware of the acceptance process. It was felt to be more important that when making Go and NoGo decisions both departments are being heard and there are enough specialists deciding whether some item should be developed or not. Everybody also agreed that when the ideas are decided to be not proceed further, employees who have been providing these ideas should know the reasons for that.

Third, one department head was aware about the place where development ideas and feedbacks are stored since he has been part of the prioritization discussions. Other interviewees were not aware of the current idea management system. The current Mural board was shown to them, and everybody liked the visual appearance of it. The challenge with the board identified in the interviews was that development items only have high level titles. This makes it difficult for employees in the case organization looking at the board to recognize the ideas as their own or the ones what they are searching for. It was proposed that the ideas should have further explanation, and, for example, a more detailed use case or action described where they bring improvement.

Fourth, for the concept refinement stage the interviewees had variable understanding and views, who should be involved. Some of the interviewed persons thought that Development Manager and Process Specialists have the needed knowledge to refine the concept around development idea, while some of the interviewed persons highlighted that the specialists and the end users have the best knowledge, and they should be included into the discussions. One of the supervisors proposed to include more people into the discussion, but also reminded about optimizing usage of the resources:

> Specialists and end users have the best knowledge about the hands-on work. They must be included in the discussion on concept refinement stage, but it needs be considered carefully how to do it. Using the existing forums for the discussions would optimize the usage of the resources and people's time. *(Supervisor B)*

Fifth, supervisors and department heads felt that they had partially affected the prioritization of development items. Some of them felt that even though the importance of work item had been emphasized and thus prioritized, the necessary development had not happened. In the downstream process, the scope of the concepted development items might change, or items need be developed incrementally. Expectations and outcome had not been always met, and Development Manager working in the downstream has a crucial responsibility to communicate possible changes to the case organization representatives. Therefore, Heads of Departments saw they role in prioritization as giving high level targets, but they would leave the detailed level prioritization to the Development Manager and Process Specialists. Supervisors agreed with this view and didn't feel necessary to participate in the prioritization discussion.

Sixth, the interviewees had understanding on the high level what is happening to the development items when they are pulled to the downstream. One of the perceived challenges in the downstream development was that estimated time schedules or quality of the features do not correspond to what was conceptualized. Better co-operation is needed inside the case organization in the upstream process and between the business and development teams in the downstream process, so that the agreed level of the quality can be achieved; and if the larger entities need to be developed incrementally, this needs to be communicated clearly to the business unit.

To sum up, the experiences and expectations regarding the upstream process, as well as many of the stages and participants who have been involved into them, have been a bit unclear to the interviewees. More transparency and understanding of the development model are needed for the end users, specialists as well as the supervisors. The common opinion was that the more information and understanding is reached, the better. With more understanding, the case organization could better trust the employees involved in the development. Business case calculations, especially for the bigger development entities, were also proposed to be used to support prioritization decisions. These would also help to measure how the development team has succeeded, and when/how the item can be measured after it has been delivered to production.

3.3.4 Working in the Agile organization

The case company is committed to the Agile development model, and presently, Scaled Agile Framework is used as a development model. During the interviews, it came up that

many of the interviewees only have upper-level knowledge regarding agile way of working, even though they may be Process Specialists working in the Agile Release Trains that follows SAFe's framework. Only two out ten interviewees had received training regarding SAFe. Interviewees also agreed that the end users of the organization do not have an understanding about agile development or SAFe's process and principles.

The agile approach is one of the case company's strategic capabilities that enables the company to adapt, quickly seize the new opportunities and provide innovative solutions to their customer's problem. According to the results from the current state analysis, this capability is not utilized in the case organization in the best possible way. The case organization needs more basic understanding how the agile way of working and SAFe framework can support them to success. These means that detailed SAFe trainings are needed, especially to the Process Specialists who are working mainly in the development activities. Also, a higher-level understanding regarding agile should be disseminated to the specialists, supervisors, and department heads. It would be beneficial that the end users in the business unit know the guidelines for the development work.

3.4 Summary of the Current State Analysis Results

The analysis of the upstream process provided a view how the new development requests are collected and stored, how decisions of the items to be developed are made, what kind of discussions are executed to create feature requirements and how features are handed over to Agile Release Trains for actual development. The current state analysis also gave a view how employees in different positions in the case organization are experiencing the current way of working in the different stages of the process, what stages are the worst bottle necks and have the biggest improvement needs.

To sum up, the current upstream process has six steps, which are: collecting development ideas, quick analysis of ideas, placing idea to the Mural board, gathering needed information regarding the topic for concept refinement, creating needed work item tickets and prioritizing them to the downstream. Upstream is strongly dependent and driven by the responsible Development Manager.

Also, this section summarizes the strengths and weaknesses of the case unit's upstream process. Additionally, the other findings that were also made during the current state analysis. SWOT analysis of the current state is presented in Figure 6.

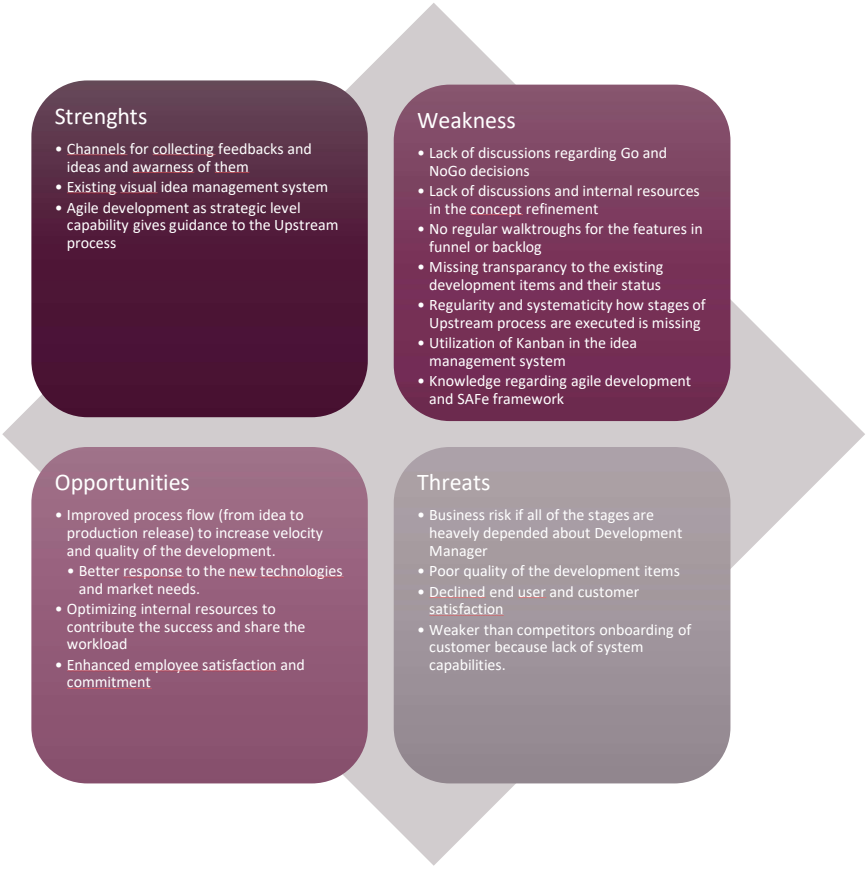

Figure 6. SWOT analysis of the current upstream process.

As seen from Figure 5, the results include three strengths, seven weaknesses, three opportunities and four threats. They are explained in more detail below.

3.4.1 Strengths of the current upstream process

The strengths of the business unit's upstream process were first, the existing channels, where the end users can give feedbacks and development ideas. Most of the people are aware of them and they were mainly easy to find and use.

Second, the idea management system was identified to be the foundation for centralizing development items into one place. The current idea management system is function and supports the upstream process, but some enhancements and improved in visualization is needed for example to categorize a huge number of ideas and emphasize the steps in the upstream process.

Third, an important strength is organization's strategic level capability to work in an agile way. To support the agile way of working in different business units and departments, the case company has provided multiple materials to guide that work, and the case organization has The Agile DNA Support Team who can help with the experiments and implementation of agile methods. Having this support, guidance and all the materials is a strength, but the way how the business unit currently utilizes these materials and capability in its upstream process is a weakness.

3.4.2 Weakness of the current upstream process

First, the key weakness of the current upstream process was the lack of discussion and poor internal participation in different stages of the upstream process. Employees in the case organization were not involved to make Go and NoGo decisions, and the discussions in the concept refinement stage were under the responsibility of Process Specialist. More people in the different positions are needed on the discussions and in the decision making. Close collaboration is needed so that right decisions can be made, and the best possible solutions can be identified to deliver better value for the end users.

Second, transparency and visibility for the development items in the upstream' s funnel and backlog are rather poor. Employees in the case organization are mostly not capable to check whether some idea already exists or not, and they have no visibility how the development items are progressing. Discovery is an important part of the work, and lack of transparency causes uncertainly. When the case organization representatives are not aware of all stages that development items are going through, they are frustrated for the time that it is taking for one item to go through the whole upstream and downstream process.

Third, the case organization has the Mural as an idea management system where development items are stored. Kanban has been drafted on the board to visualize the some stages of the process. Kanban board is not easy to understand, and the way how

it is currently utilized needs improvement. The case organization should target to have a continuous flow of validated development items that can be pulled to the downstream.

Fourth, understanding about the agile development process, the agile way of working, and how development items are proceeding in the Agile Release Trains needs improvement. Understanding of the current development model on the high level and knowing basic agile principles would make working in the upstream process and other development activities more efficient.

3.4.3 Other findings

As of part of the SWOT analysis, also opportunities and treats were identified, and some additional findings were made.

First, three important opportunities were identified in the SWOT analysis. The opportunities are presented in Figure 5. Better velocity of the work items can be achieved when the process flow from idea to production release is improved. This would help the case organization to react to market changes and for example adapt the new technologies. Optimizing internal resources and involving more employees bring the different views at each stage of the upstream process and improve the quality of the development items. That would contribute to the success and increase employee satisfaction as well as commitment. Including more employees into the process would also share the workload and help to identify different needs inside the case organization end-to-end.

Second, some threats were also identified during the current state analysis. The biggest threat and business risk is that the current upstream model is heavily dependent on the actions of the Development Manager. In some of stages, there is nobody else involved. A sudden illness or absence from work paralyzes the upstream and affects the downstream process as well. To mitigate this business risk, more people need be onboarded and knowledge of the process should be expanded, so that in case of replacement it can done quickly and smoothly.

Third, as an additional finding part of the current state analysis, it was noticed that the business unit has been managing with a large backlog (+100 items) and long unpredictable lead-times. End-to-end lead times from the development request up to the

start of the deployment have varying from 8 weeks to years. With a large backlog it is crucial to use Work-in-Progress limits, the maximum amount of work that can exist in each status of a workflow. It would make the team to focus a smaller set of tasks at each time and help the business unit to keep a steady flow of work items ready to pull downstream.

Summing up, some case organization's representatives have been participating in the upstream process, but there is still a crucial need for improvements as for moving to the more agile development model and bringing better end-to-end view to development. Functionalities and usability of the BSS need continuous co-development in collaboration with Development Manager, Process Specialist, and other representatives from the case organization as well as needed stakeholders outside the business unit. From the SWOT analysis results can be interpreted that better facilitation and transition of value-adding request from upstream process to downstream is needed. That will ensure a continuous and steady flow of validated features.

3.4.4 Selected Focus Areas

The key findings and selected focus areas of this Thesis were identified after analyzing the current state through Data 1. In Data 1 strengths, weaknesses, and other findings for the current upstream were recognized and for tackling the existing challenges and pain points the following four areas were chosen in the next steps of this thesis:

1. Creating Visualization and Transparency
2. Limiting Work-In-Progress
3. Creating Explicit Policies
4. Improving Collaboration

The focus areas selected for development in the Thesis are: (1) *visualizing* the ideas and workflow stages, (2) *limiting work-in-progress* development items, (3) *creating explicit policies* for the upstream process, and (4) *improving collaboration* in different stages of the upstream.

These selected focus areas can enhance the current upstream process and are investigated further in the following sections in order to build the proposal for needed improvements for the case organization. In the following section 4 explores the existing knowledge and best practices regarding these selected focus areas based on the literature and best practice search.

4 Existing Knowledge of Upstream Process in Agile Development

This section discusses the existing knowledge and best practices related to the upstream process in agile development. This section consists of four areas: Creating Visualization and Transparency, Limiting Work-In-Progress, Creating Explicit Policies, and Improving Collaboration in the different stages of the upstream process in agile development. These selected focus areas are explored from the Scaled Agile Framework (SAFe) and Kanban points of view that make part of agile approach used by the case company of this thesis, which determined the choice of literature and best practice for this section.

4.1 Differences between SAFe, Scrum or Kanban

Scrum and Scaled Agile Framework (SAFe) are different frameworks that both follow Agile and Lean principles and values.

Freedman (2018) describes *Agile* being evolutionary and revolutionary way of thinking for companies. Agile practices are embracing collaboration, continuous planning and improvement, incremental delivery, and the constant organizational learning. According to the State of Agile Report (Digital.ai 2022), high-performing Agile teams have people-centric value, clear culture, tools, and leadership empowerment. This encapsulates that when executing Agile successfully, benefit accrues to the entire organization.

Lean is the concept of efficient operations that is based on the continuous improvement where wasteful resources, which are not providing the value are eliminated (Skhmot 2017). Lean thinking was created by Taiichi Ohno, the mastermind of the Toyota Production System. The Fundamental idea of the lean principle is to maximize the customer value while eliminating the waste. In Toyota, this principle was adapted to product development with the aim to complete development projects as soon as possible after it was started, because work is not providing any value until the product has been produced (Poppendieck & Poppendieck 2003). The concept of Lean can be applied to any production or operation business across different business areas.

According to Scaled Agile (2023d), *SAFe Framework* is a method how agile can be scaled to large enterprises or bigger teams. SAFe's framework engages the whole organization with Agile principles, Lean principles and System thinking. SAFe utilizes

these three knowledge bodies in program management, team management and portfolio management.

In *Scrum,* complex problems are solved at the same time when products and services are delivered with the highest possible value. Scrum utilizes iterative approach to complete work items, tasks are delivered in the stages instead of completing a whole work item at once. Schwaber and Sutherland (2017) highlighted that Scrum's framework is incomplete and instead of providing detailed instructions the rules of Scrum guides people's relationship and instructions. The main difference between Scrum and SAFe is their scalability. Scrum is used to organize small teams, while SAFe is used on the enterprise level. (Schwaber and Sutherland 2017.)

Kanban is a Lean workflow management method that Scum and SAFe teams can also utilize. Kanban uses principles and practices that guides organization to visualize what needs to be done, what work is in progress and what work items has already been done. Kanban has six essential practices which are: *Visualize, Limit work in progress, Manage flow, Make policies explicit, Implement feedback loops and Improve collaboratively, Evolve experimentally* (Andersson & Carmichael 2016:17). Making work visible via Kanban increases productivity and the better fluency in the execution of work can be achieved. (Andersson & Carmichael 2016:1.)

Business practitioners believe that organizations can use either of the agile framework, Scrum or SAFe, depending on the size of the company, and maximize the benefit with Kanban. (Andersson & Carmichael 2016:1.)

4.2 Creating Visualization and Transparency

Making a work visual and having it available for the team members and the organization is a fundamental element of Kanban. Visual systems allow teams observe and self-organize. Also, they provide transparency and make it easy for different participants and stakeholders to follow how things are progressing. Business practitioners believe that the flow of work items is improved when information sharing is open. (Damij & Damij 2021.)

However, visualization and working methods alone are not enough for the success of the organization; all employees working around Kanban need to commit to this way of working.

4.2.1 Kanban Method and Establishing Kanban

Kanban is an agile method that was first implemented in Toyota's manufacturing process in the 1950s (Damij & Damij 2021). Scaled Agile (2023a) defines Kanban as a Lean workflow management method that is used to manage and continuously improve the products and services build for the customers and end users´ needs. According to Boucherou (2016), Kanban is an agile project management tool, and in Japanese it means "signboard". Kanban visualizes and helps understand the different stages of workflows so that teams can get the work done. Nature of the Kanban varies depending on the level and purpose it is used for. But it always has common values, principles and practices (Andersson & Carmichael 2016:vii.)

Visualization is executed by a team utilizing the Kanban. States in the process are listed in columns according to the sequence which they are executed (Leopold & Kaltenecker 2015: 27). Elements that the Kanban board includes are illustrated in Figure 7.

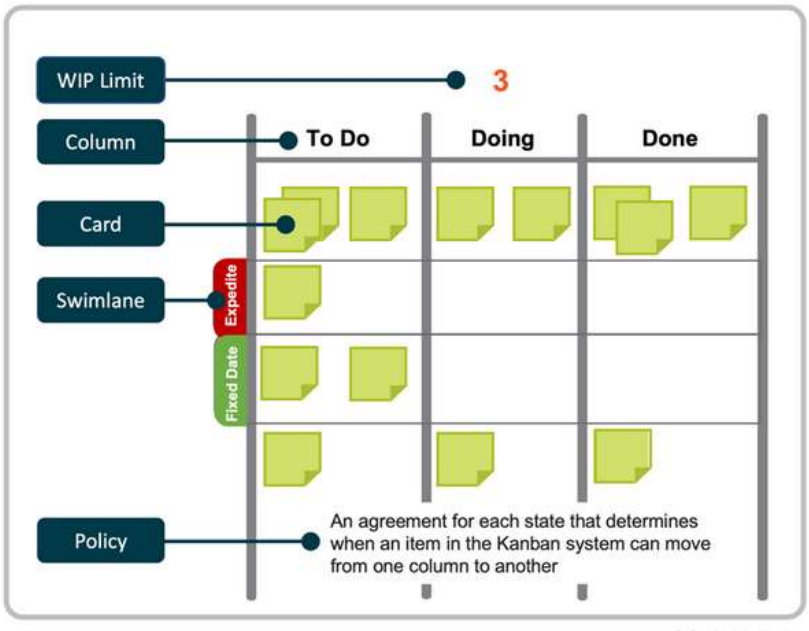

Figure 7. Example of Kanban system elements (Scaled Agile 2023a).

As seen from Figure 6, in the Kanban, work items are represented as cards, which allows team members to identify easily the state of some specific work. Kanban is telling what to do next and it help teams commit the right amount of work. Elements of the Kanban can be divided into the five categories which are Work-In-Progress (WIP) limits, columns, cards, swimlines and policies. *WIP limits* define the maximum number of the work items that can exist in each state of workflow. WIP limits are discussed further in Section 4.3. *Columns* represent the states of the workflow, *cards* represent work items, and *swimlanes* highlight related work items which support and define the team's workflows. *Policies* specify how the work overall is managed and how the work items are moved from one state to another. (Scaled Agile 2023a). Policies of the Kanban are examined in more detail in Section 4.4.

Scaled Agile (2023a) defines four tenets that helps teams establish and adopt Kanban. These same tenets are highlighted also by Leopold and Kaltenecker (2015: 16) and can be also defined as Change Management principles:

1. Start with what you do
2. Agree to pursue incremental, evolutionary change
3. Respect the current process, roles, responsibilities, and titles
4. Encourage acts of leadership at all levels in your organization. (Leopold and Kaltenecker 2015: 16.)

The first step is crucial, so that the Kanban can be established. Idea of the Kanban is not to change the existing workflow but advocate the evolutionary change that can be executed piece by piece. Initial design of the Kanban starts by building an approximation of the current workflow. It is believed that, when the current practices and practitioners are respected, resistance can be minimized, and it is easier to engage people in meeting challenges of the future. Figure 8 presents the example workflow of a software team. (Scaled Agile 2023a.)

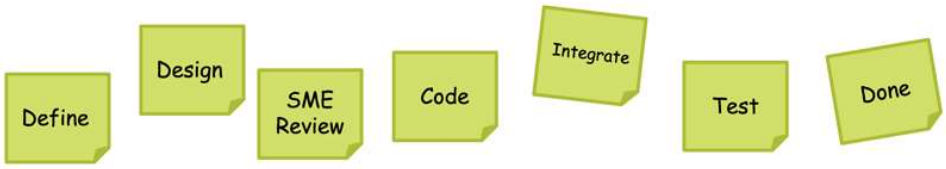

Figure 8. Example of software team's current workflow (Scaled Agile 2023a).

To help identify the workflow's stages, the team can start by asking questions such as which are the value-generating activities or what is the sequence of the individual steps of the process (Leopold & Kaltenecker 2015: 26). Answering these questions helps the team to identify which stages the team wants to follow in the Kanban, and they can be further merged or split, and some review states can be added if needed. Optimizing stages in the Kanban is important because too many stages can make it complex and too few can hide bottlenecks. (Scaled Agile 2023.)

In Scaled Agile Framework, Kanbans are utilized throughout SAFe on different levels. A Kanban board is improved iteratively based on the team's and users' needs. After the initial process and WIP limits are set and used for a while, bottlenecks come visible (Scaled Agile 2023a).

Business practitioners believe that utilizing Kanban can solve many problems in project and product management, governance, and enterprise agility. With an efficient management, Kanban can visualize the work and decision making, optimize the workflow to increase value, enable short feedback loops and create the culture of transparency and collaboration. Benefits that can be achieved include, for example, faster delivery with higher quality, stability and predictability of the development work, more effective communication, and increased customer satisfaction. (Berriprocess Agility S.L. 2022.) However, starting a Kanban initiative is easy but creating a culture of continual improvement is highly challenging (Leopold & Kaltenecker 2015: 4).

Summing up, Kanban can visualize a downstream process of agile development, and it is utilized to represent delivery workflow. Having an Upstream Kanban and strict governance is also crucial, and in the next sub-section explores how an Upstream Kanban could be utilized to enhance the upstream process.

4.2.2 Upstream Kanban

Steyart (2017) introduced Upstream Kanban in 2010. Idea of the Upstream Kanban is to create a consistent stream of the ideas and enable an efficient delivery workflow. Since Kanban visualizes the stages of the idea refinement during the upstream process, by utilizing Kanban it is possible to model workflows, ideation, and concept development processes.

Upstream Kanban is not as well-known as a downstream Kanban, which is also called Delivery or System Kanban. Upstream Kanban is an emerging field, and more is learned all the time how to help business people to develop their ideas. (Steyerst 2017: vi-viii.)

Steyers (2017) visualizes the Kanban board where the whole end-to-end flow is presented from capturing of idea to ending the work items that are ready for deployment. Steyres´ board is presented in Figure 9 below.

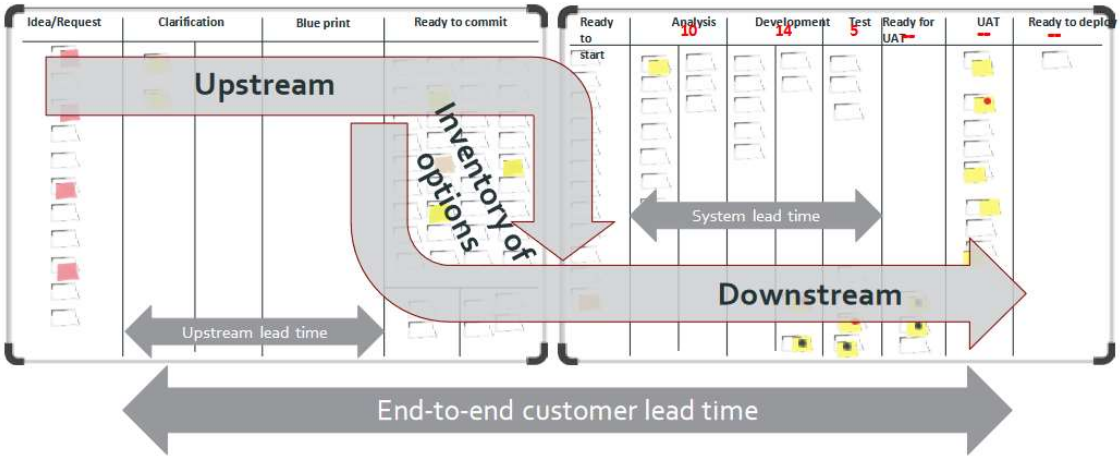

Figure 9. Upstream and Downstream Kanban visualized as the end-to-end flow (Steyers 2017:13).

As seen from Figure 9, the flow consists of upstream and downstream parts including the options in-between. Often the lead times of the development items are measured only in the downstream part by using a System lead time. But as can be seen in Figure 9, the System lead time represents a small part of the end-to-end lead time that is more important for the business. Despite the importance of the end-to-end lead time, reliable promises can be given only regarding the System lead time. When prioritization is made

for the downstream, many of low priority items can get stuck there and get bypassed by higher priority requests. (Steyers 2017:14-15.)

Sepathi and Drury-Grogan (2020) describe a practice where a digital transformation service unit investigated steps from idea to execution process and refined the stages of the work to Kanban boards. This team designed a Kanban system where they visualized two boards: one for the Development team and one for the Content and Design team. The Developments team's board was a general Delivery Kanban, that was based on the development process from starting the development to ending with the user acceptance testing (UAT). The board was named "Exploration of the solution space". The other board for Content and Design team was "Discovering and Exploring solutions". In the discovery phase, the team wanted to understand and refine the problem with the users and build necessary drafts based on discussions with the stakeholders. This board was simulating the Upstream Kanban, and the flow of the boards visualized the current stages of the design workflow. Their improvements to refined utilization of Kanbans contributed to the better visibility, improved collaboration, and improvements to Lead Time.

Stayers (2017) also introduce a practice where the IT maintenance team improved their end-to-end flow with the Upstream Kanban. The purpose of the Kanban initiative was to improve the flow of work and limit the number of the work items that are in progress. Kanban that this IT maintenance team used before improvements is presented in Figure 10 below.

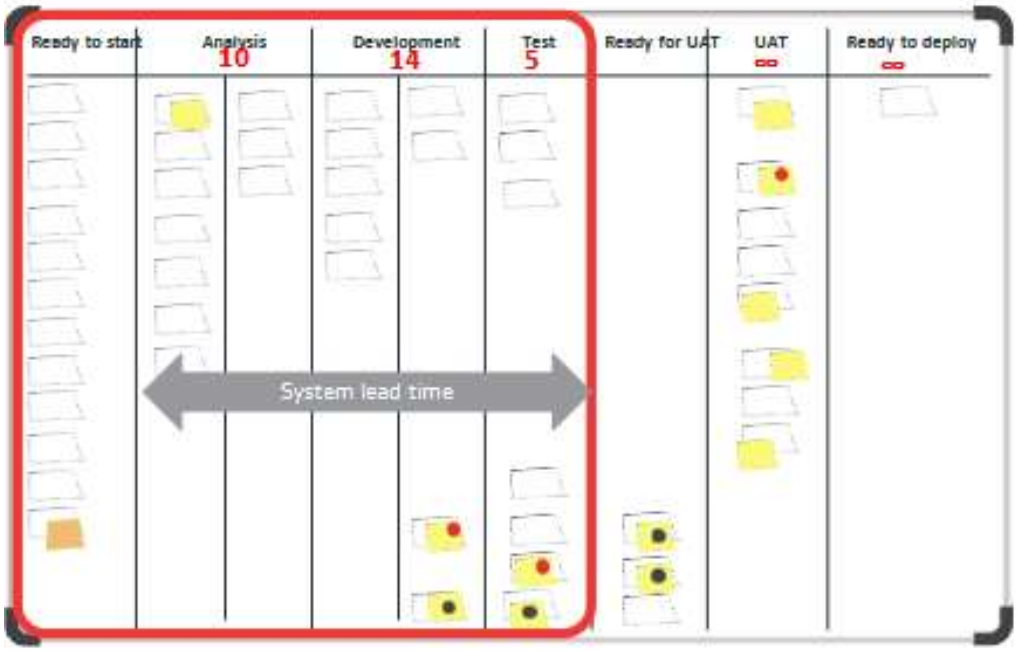

Figure 10. Downstream/Delivery Kanban of the IT Maintenance team (Steyers 2017: 4).

As seen from Figure 10, the first state of the team's Delivery Kanban is Ready start, where the work item is committed, and the last state is end point where the work item is ready for deployment. The team works with the "pull" method where workers are pulling work from previous states rather than having work pushed to them. WIP limits marked on the board in each column define how many work items the team can handle in parallel. (Steyers 2017:4-5.)

This Delivery Kanban focuses on the flow of work for establishing the service or product. But it is only one part of the overall end-to-end flow. This team identified that customers are pushing a lot of requests in before they are managed in the Delivery Kanban. The phase where the inventory of the requests is managed is the upstream process. The team realized that a steady delivery can be achieved when both the steady flow of demand (Upstream Kanban) and the steady flow of work (Delivery Kanban) are in balance and have functional processes. (Steyers 2017:11-12.) This is a similar conclusion that Sepathi and Drury-Grogan (2020) made in their practice that was investigated in the previous sub-section.

Another thing that this IT maintenance team realized as part of their practice was that the upstream process and effort centralized to the work item should be defined based on the work item´s priority. This is presented in Figure 11 below.

Figure 11. Allocating assessment effort in the upstream (Steyers 2017:23).

The IT maintenance team learned that a lot of effort can be used for analyzing and assessing requests. Low risk development requests are easier to assess because of minor complexity, but they often are left to the inventory when more important items are pulled into the Delivery Kanban. High risk development requests are normally causing frictions such as delays and rework in the upstream, and they require a lot of work to assess but also most likely can get postponed or rejected later. Both situations are causing waste of efforts and some frustration. To optimize the assessment effort in the upstream, the IT maintenance team started to select items for assessment more carefully and limit the number of the parallel items in progress, when pressure to pick the right alternatives got bigger. (Steyers 2017:17-18.)

The team also created the assessment rules for low risk and high-risk development requests. For low-risk items, a full assessment effort can be committed when decision to assess the item has been made. For the high-risk items, some analysis for the initial assessment effort is done first before committing to the full assessment. This way if in initial assessment effort is identified to be huge, it is still possible to reject the item before wasting any time for the full assessment and then rejecting the item after that. (Steyers 2017: 17-18.)

This team also described the upstream as a triage process where each of the request needs to go through multiple steps, but not all items are going through the same steps, and they can have the different urgencies. A lower value request can flow to the inventory fast, when higher value items require more elaboration in the upstream, meaning synthesis and analysis. The assessment process of higher value items is illustrated in Figure 12 below.

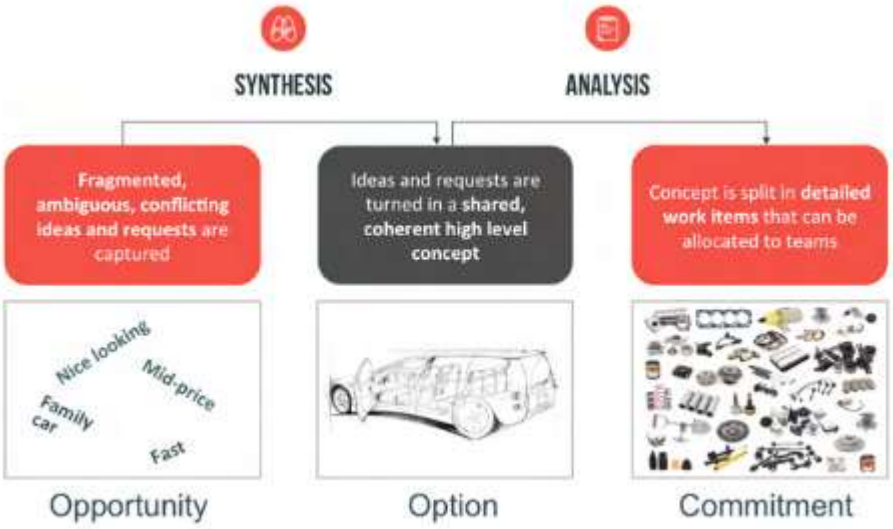

Figure 12. Upstream process for higher value items (Steyers 2017:23).

In this triage framework, requests were flagged in different color codes. The color that an item had in the Kanban told where it needed synthesis and analysis or not, and whether the value of item was uncertain or certain. Red color in the triage framework identified urgent request that should be prioritized to downstream immediately, without any synthesis or analysis in the upstream. Yellow color represented the high, but uncertain value items that needed synthesis and analysis, where the initial assessment effort needed be done first. Green color represented the items that had low, but certain value and for them the full assessment effort could be committed. (Steyers 2017: 23.)

Sepathi and Drury-Grogan (2020) also stress the importance of identifying and discovering urgency of the proposed development items in the early phase. In the digital transformation service unit, it was done by utilizing classes of the services which modeled the existing real workflow and the cost of the work item´s delay.

These practices discussed by Steyers (2017) and Sepathi and Drury-Grogan (2020) prove how the Upstream Kanban practices, such as visualization, managing the flow and board design, can improve development excellence. Since agility's key element is ability to quickly respond to change, agile development requires a proper collaboration for fulfilling requests. As ideas and request are diverse, fragmented and requirements often conflicting, it requires right mechanisms and processes in place for refining and delivering solutions, so that those that do not fulfill the original needs can be avoided. To maximize the highest possible value and fulfill the demand, capability to anticipate and collaborate becomes vital. That is also a significant contribution to business agility.

4.2.3 Highlights from Visualization and Transparency

Research of the Kanban's key elements demonstrate that Kanban system can simplify the workflow (Steyers 2017; Sepathi and Drury-Grogan 2020, etc.). When all work and policies are visible, it is easier for team members and stakeholders to understand the workflow and identify possible issues. As highlighted in the Kanban principles, implementation should be done based on what the team is already doing; and after that all the steps can be refined. Creating sequence of the Kanban stages can start from the present workflow.

To summarize the changes that would have a vital impact to the Upstream process, these points can be highlighted, for example:

First, the Upstream Kanban visualizes the stages of development request from the idea to ready-for-implementation work item. When stages are visualized on the Kanban board, transition of requests is facilitated to the downstream and a continuous flow of validated options is ensured. In addition to stages other elements on the Kanban board are limits, swimlines and policies.

Second, the Kanban method respects capacity and makes scheduling of work easier with the "pull" system. Capacity allocation should be explicit and well-understood for all stakeholders.

Third, defining paths for analyzing the development requests in the upstream and defining their urgency by using the triage framework or classes of the services helps refining of work item and prioritizing work.

Additionally, introducing WIP limits on the Kanban system can guarantee that there is a steady flow of work items ready to pull to the Delivery Kanban. In the next sub-section, WIP limits and utilization of them as part of the Kanban activity is discussed further.

4.3 Limiting Work-In-Progress (WIP)

The key element of Kanban is to reduce the amount of parallel work and multitasking. When a team is optimizing control of the flow of development by utilizing specific limits, this practice promotes continuous development without wasting any resources (Damij & Damij 2021:3). Limiting the amount of work is essential to success with Kanban and as a result it improves quality and lead time of the services (Andersson and Carmichael 2016:19).

Internal benefits for limiting the work are obvious; but having better work quality and shorter lead times can also positively affect customer satisfaction and customer experience.

4.3.1 Enhancing Kanban utilization with Work-In-Progress (WIP) Limits

Brechner (2015) defines that Work-In-Progress (WIP) means a limited number of work items allowed in each state in the Kanban system. WIP limits have two essential purposes. They limit amount of the work in progress and restrict the flow of work to match velocity of the slowest step, what defines the pace for the other steps. Andersson and Carmichael (2016:1) also highlight that when WIP Limit are presented in Kanban boards, it is possible to prevent that too much or too little work enter the system, and this way value to customers is improved. Limiting the number of parallel activities and focusing energy on a smaller number of items is one of the key characters of Kanban (Karaivanov 2023). Thus, WIP limits are very important to define on the downstream. But to guarantee continuous development end-to-end, they are very much needed on the Upstream Kanban as well.

Kanban typically uses the visual signals to limit WIP. Usually, limits are displayed on the column that represents the activity, as shown in Figure 13 below.

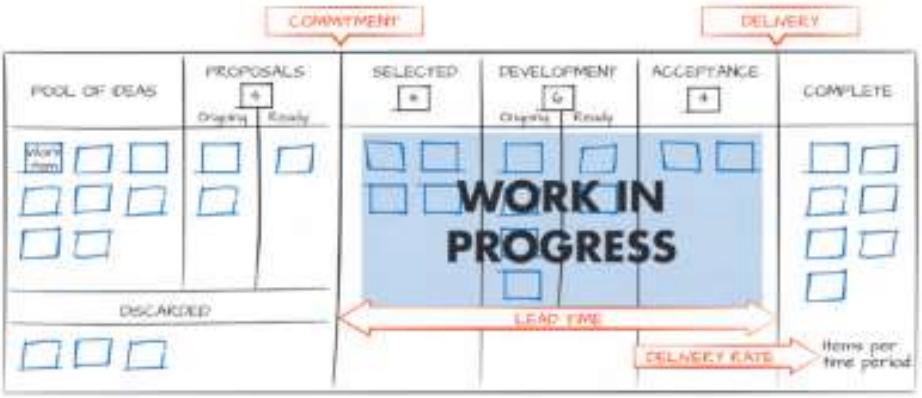

Figure 13. An example of Kanban board with WIP limits (Andersson & Carmichael 2016:13).

As shown in Figure 13, rectangles on the columns illustrate the WIP Limits and their policies creating the “pull” system. A work item is pulled into the state of workflow when other work is completed and there is capacity available. Since WIP limits emphasize the importance of restrictions, they are crucial to enable the collaboration and steady workflow. WIP Limits also improve agility. It happens when the work item´s time in progress is reduced and the team is working together to keep the limits low and lead-times short and predictable (Steyaert, 2017: 6). In the Upstream Kanban, WIP limits are relieving team members and the system from overburdening. (Andersson & Carmichael 2016: 13.)

The Kanban system typically has commitment and delivery points which are also visualized in Figure 13 above. When the commitment point is reached, it is explicit that the end user or customer needs the work item, and the item needs to be delivered based on its priority. The Delivery point is the point where responsible person, such as business owner, gives approval for the work item to be completed. (Andersson & Carmichael 2016: 13-14.)

When WIP limits are set, it is possible that some intermediate stage reaches the limit and all items are done, but there is no capacity in the next stage to pull item yet. In this scenario, the workforce should be focused to accelerate the work in the stage that currently has no capacity to take new items. Bottlenecks can occur, and then the team needs to move to the work with items which are blocking the flow to enable the flow to move again. Thus, Kanban work requires continuous learning and observation, which means continuous adjustments regarding WIP limits and other policies. (Brechner 2015.)

Importantly, business practitioners believe that working with too many complete work items in parallel is wasteful, expensive and it is also extending lead times and preventing organization to be responsive. By optimizing the number of the work items in progress, success with the Kanban can be achieved, and as a result of that, quality, lead time and rate of deliveries can be improved. (Andersson & Carmichael 2016:19.)

According to Damij &Damij (2021), in order to optimize WIP in Kanban, lead time of the work items should be limited. For this end, Little's Law is used to examine the velocity of the development items meaning the delivery rate. Little's Law illustrates that when more work items are put in the process, lead time will increase, and it takes longer for work item to get to the delivery point (Damij &Damij 2021:3). Delivery rate can be calculated by dividing the number of deliveries by the length of the lead time (Andersson & Carmichael 2016: 15-16):

$$\overline{Delivery\ Rate} = \frac{\overline{WiP}}{\overline{Lead\ Time}}$$

Lead time is measured from starting of development item to its acceptance, so the delivery rate will be calculated from the committed to delivery point. If the whole end-to-end process is measured, there is an alternative formulation of Little's Law. Instead of Delivery rate, Throughput can be measured by dividing WiP by the Time in Process (TiP), what illustrates the period an item is in the process under consideration (Andersson & Carmichael 2016: 15-16):

$$\overline{Throughput} = \frac{\overline{WiP}}{\overline{TiP}}$$

It is obvious that Little Law can be an excellent way to provide measures how WiP Limits are affecting to the delivery rate or throughput.

4.3.2 Highlights from WIP Limits

Business practitioners observe that it is quite usual of any kind of team to suffer from a long list of uncomplicated tasks, multitasking, and having an unorganized way of working methods. To improve performance and to support the team with a steady working pace

without anyone being overwhelmed limiting the amount of Work in Progress needs to happen. It will help to manage and achieve an optimal workflow. (Andersson & Carmichael 2016; Damij &Damij 2021; Brechner 2015, etc.)

To enhance the upstream process, the following practices especially can be noted and adopted for implementation in any organization:

First, it is worth setting the WIP limits in order to ensure that Kanban system works, and when they are set, the team needs to respect the limits set. WIP Limits will prevent overproduction of the ideas that can be discarded in later stages and thus avoid overloading the delivery flow in the downstream.

Second, it is necessary to continuously observe the process and adjust the WIP limits when needed. It is not necessary to put too much effort in setting the initial limit, because they can be wrong at the beginning and thus need be adjusted later.

Third, it is recommendable to decide if the team wants to measure the end-to-end lead time or the upstream lead time what would give concrete figures and numbers about the progress.

Additionally, the policies as for how and by whose decision the work items are moved onto the Kanban board are also important to define. These policies and other needed polices related to managing work on and around Kanban are discussed in the next sub-section.

4.4 Creating Explicit Policies

Explicit policies are the rules that give guidelines how to execute the different actions. They are known, visible, understandable, and important part of the Kanban. Efficiency of the Kanban workflow can improve when a clear process and polices are made for managing work. (Damij & Damij 2021: 4.)

Business practitioners believe that well-written and announced policies become routine easily. Policies help in understanding the work that the team is doing, how much they

can handle in parallel, and what quality level the work items should reach so that they can be delivered from upstream to downstream (Damij & Damij 2021: 4).

4.4.1 Value Delivery with Explicit policies

Policy can be defined as an explicit description of behaviour. Kanban policies are the agreed procedures that are defining guidelines for the team that should be followed when executing work. Policies can also be thought of as a checklist, telling what should be done in each stage of the Kanban process. (Andersson & Carmichael 2016: 22.)

Explicit policies are often visualized in the Kanban board and they enable team members to make correct and high-quality decisions and take actions to optimize the outcome and benefits to customers and end users. Business practitioners believe that policies should be developed collaboratively, with the team, when anyone can input ideas and get clarity about the process. (Andersson & Carmichael 2016: 22.)

For example, WIP Limits which were discussed above are the policies regarding how and by whose decision the work items are moving from one place to another place on the Kanban board. Before the work item can be moved to the next column, it should pass certain rules — i.e. an agreed definition for that step. Columns in the Kanban can be also divided into two sub-columns to better visualize which items are ready to pull to the next step and which items are still under progress. (Brechner 2015.) An example how one column can be divided to better manage the overall flow is illustrated in Figure 14 below.

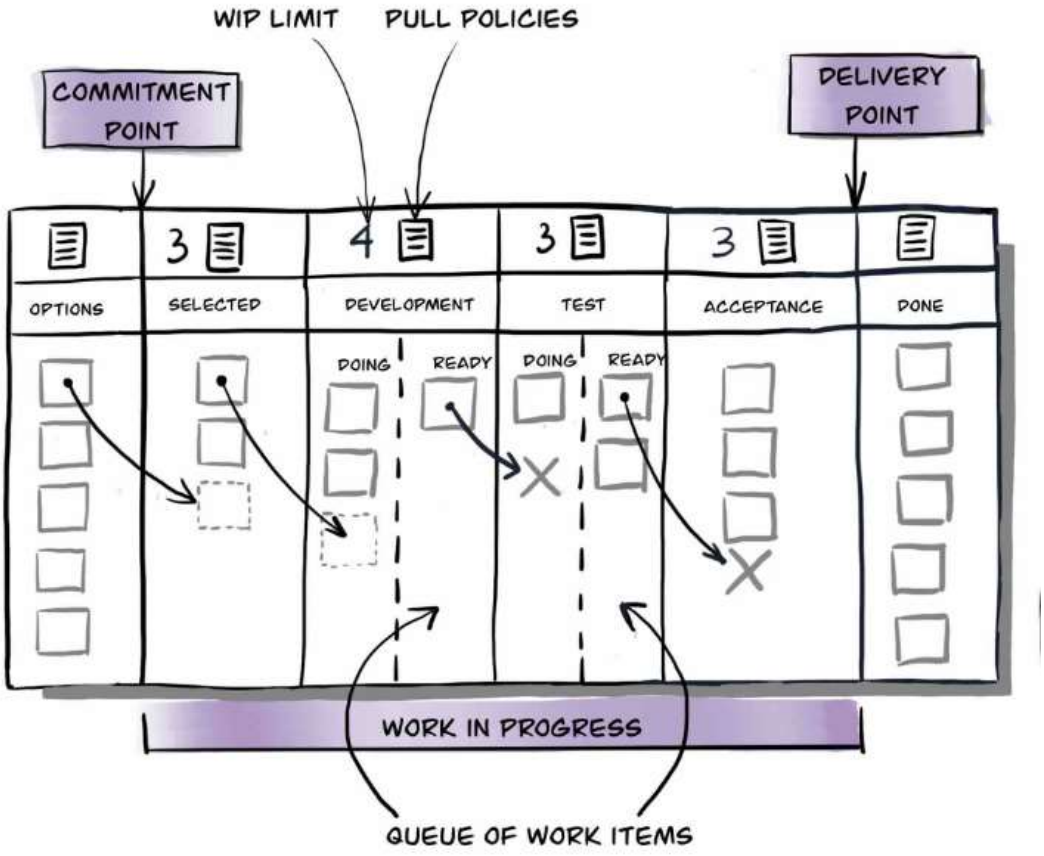

Figure 14. Example of Kanban board where one column is divided to two parts (Lewinski et. all 2021).

As seen in Figure 14, cards in the columns take the place based on the priority order, with the top card always pulled off when the team is ready to work on the next item. In Figure 14, Development and Test sections are divided into two columns were the column on the left holds active work items which are still in progress, while the right column holds work items that have been completed and are waiting to be pulled to the next step. (Lewinski et. all 2021.)

Scaled Agile Framework (2023c) describes that the Kanban makes the team´s work and processes common and clear. For example, at each stage, the entry or exit policy clarifies what needs to be done before the work item is pulled to the next state. When any of the team members or stakeholders is viewing the Kanban, they should have a clear understanding of the workflow and its policies. The example below lists the explicit policies that a team can utilize:

1. Define policies to start work

2. Define who can add new ideas to board and move them

3. Define handling of critical requests

4. Definition of Done

5. Handle impediments. (Scaled Agile Framework 2023c.)

Scaled Agile Framework (2023c) also introduces classes of the service as a way to improve Kanban workflow. Classes of the services are set of policies that the team can use to categorize work items based on their priority and risk level. It helps to focus the team´s efforts on high-priority work. The team can utilize and establish policies for service classes to optimize the flow. For example, classes of service can be categorized into three categories where:

- *Standard* are general work items which does not have a high cost of delay.

- *Expedite* are urgent work items that has high cost of delay and they require immediate attention.

- *Fixed date* are work items that needs to be delivered before specific date. (Scaled Agile Framework 2023c.)

According to Scaled Agile Framework (2023c), benefits for utilizing classes of the services as part of the Upstream Kanban include improved prioritization of work items and enhanced risked management when the high-priority work items can be recognized, and necessary attention can be given to them.

4.4.2 Highlights from Creating Explicit Policies

Business practitioners believe that certain policies for explicitly describing the ways of working are necessary so that Kanban experience can be improved (Andersson & Carmichael 2016; Lewinski et. all 2021; Scaled Agile Framework 2023c, etc). It is obvious form the discussion above that efficiency of the work increases, when clear policies have been created for managing work. To summarize the key elements that

business practitioners stress in relation to explicit policies in Kanban activities, the following points can be highlighted:

First, it is necessary to create explicit policies how to pull and move work items on the Kanban board. A definition of what is “done” should be defined for each stage.

Second, some specific policies are needed for utilizing Kanban. For example, guidelines need to be agreed how to make decisions which work items are accepted to proceed with, and which are still “work in progress” and which will not be developed.

Third, Kanban workflow can be improved by utilizing the classes of services. The classes of services are policies, that are used to categorize work based on their priority and risk level.

Fourth, the policies for work items should be written policies. These means that team has mutually agreed a way how to write the work items to Kanban and how to use categorization if needed. When written policies and categorization is clear, it is also easier for employees outside of the organization to interpret work items from the Kanban board.

Next, for increasing efficiency of Kanban utilization, collaboration and willingness are needed to share and exchange information. The ways how collaboration can be improved when the Kanban is utilized is discussed in the next sub-section.

4.5 Improving Collaboration

In the previous sub-sections, it has been discussed how the Kanban can visualize and control the workflow, how it can enable short lead times and what kind of policies should be defined when working the Kanban. Because the Kanban makes a lot of things visible, it is important to focus more specifically on how to achieve an effective collaboration.

It is a well-known fact that success in projects relies on communication (PMBOOK 6.0, 2017: Section 10.1). Another well-known fact is that agile prioritizes close collaboration and information sharing between stakeholders to enable quick decision-making. In the Kanban, visualizing work and pulling it across the board makes a specific type of

communication. The Kanban method defines cadences which enable regular discussion and collaboration to help execute the Kanban operations effectively. (Brechner 2015: 66.) Collaboration in agile development and improving it are discussed below.

4.5.1 Defining Feedback loops

In Kanban utilization, different feedback and communication loops make an important part of the process. Kanban defines seven feedback opportunities called cadences that are presented in Figure 15 below. These cadences are providing bi-directional communications in needed levels of the organization. The Feedback loops ensure easy information sharing and, thus, make the basis for continuous improvement. They are principles to increase productivity of any process. (Andersson & Carmichael 2016: 23-24.)

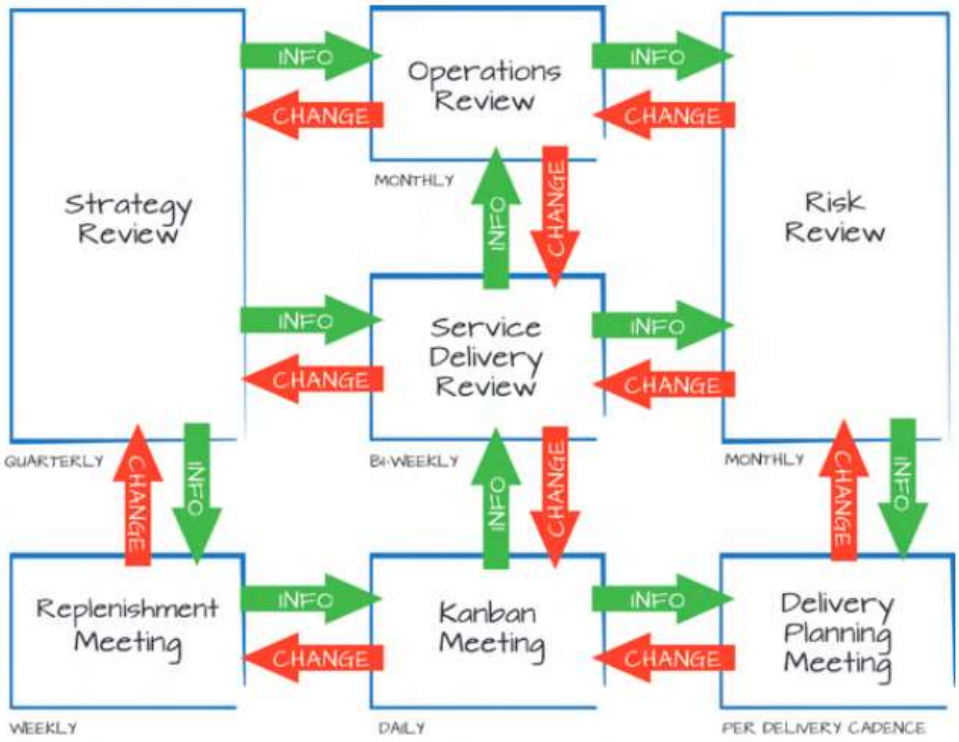

Figure 15. A set of cadences showing feedback loops (Andersson & Carmichael 2016:24).

As seen from Figure 15, Kanban methods encourages teams to utilize the different feedback loops to review i.e., stages of workflows, metrics and other indicators, strategy, and plan delivery of the work items. Meetings can be separated into Team Level Cadences and Service-Oriented Cadences. Kanban and Replenishment meetings are

Team Level Cadences while Strategy Review, Operations Review, Service Delivery Review, Risk Review and Delivery Planning meeting are Service-Oriented Cadences (Andersson & Carmichael 2016: 24). Even Kanban method defines these seven cadences, at the same time business practitioners want that no meetings should be ever regularly held just because the framework says so. Team should be capable to recognized which cadences are needed to adapt as part of the Kanban practice. Especially when an evolutionary change is happening and utilization of the Kanban is started, more intensive communication with different stakeholders is recommended and cadences are needed to support team's work. (Leopold and Kaltenecker 2015: 65-66.)

Meetings are held in the different stages of end-to-end process, in the upstream and downstream. When team has identified necessary feedback loops, it is important to make sure that they are existing. In the upstream, it is crucial to keep the Kanban board up-to-date, check work-in progress items regularly, and only include the work items in the board that have a change for implementation. At regular intervals, the team should examine the backlog and decide if some items there can be removed. This can be done in regular *Kanban meetings* (Leopold and Kaltenecker 2015: 65-66). The Kanban meetings are also a good moment to check WIP limits and focus on sharing tasks between team members if needed. In these meetings, the team can also walk through the new development requests and make decisions about their acceptance or rejection.

Replenishment meetings are held to move the work items over the commitment point, where they are waiting prioritization to the downstream. When items are waiting prioritization, team needs to agree about the most important work items, thus priority sequency of the committed work items are discussed in these meetings. *Strategy Review* is the highest-level meeting and purpose of it is review and adjust strategy-based information. It is the opportunity to check and show managerial level of business unit or organization that right things are progressing in the development and ongoing development work is aligned with the strategy. (Andersson & Carmichael 2016: 25.)

However, adapting seven cadences to the upstream or the downstream does not mean adding seven new meetings. Agenda of the cadences can be part of some existing meetings and a single meeting can also cover more than one cadence. (Andersson & Carmichael 2016: 25). Especially Kanban meetings, Replenishment meetings and Strategy Reviews are natural to arrange as part of the Upstream Kanban activities. In

addition to these, it is also important to the team be able to organize meetings on demand, if something important is coming from end users or customers.

Management and other different stakeholders are often interested in the status of the work items in order to see the overall progress. When Kanban is up to date, it is easy for any individual to track items from the Kanban board, without planned meetings. (Andersson & Carmichael 2016: 25.)

Summing up, usage of the Kanban and involving employees into collaboration as part of the process starts by recognizing the workflow from development request to the work item what is delivered to the end user or customer. After the workflow is recognized and visualized, it is easy to implement needed feedback loops to support the different stages of the process and knowledge sharing. When utilizing Upstream Kanban, importance of keeping team members and the organization in the loop in the terms what is happening is significant.

4.5.2 Retrospectives

The word “retrospective” comes from Latin word *retrospectare* that means look back (Loeffler 2017). According to Scaled Agile (2023b), retrospective is an organized event where members of the team can discuss results, review practices and explore possible improvement needs. Brechner (2015: 72) defined retrospectives as a meetings or workshops where the team can together identify things to be improved in the Kanban utilization and related processes. In this meeting, the team leader together with the team members and other stakeholders gather improvement suggestions and sequence them based on their urgency. Scaled Agile Frameworks (2023b) has twelve principles and its last principle describes perfectly retrospective:

> At regular intervals, the team reflects on how to become more effective, then tuned and adjust its behavior accordingly. -Agile Manifesto. (Scaled Agile Frameworks 2023b).

In Scaled Agile Frameworks (2023b), Retrospectives are arranged regularly after each iteration. Retrospectives are part of agile development and, besides having them with the team after each iteration, in general retrospectives can improve the way of working and be a channel where it is easy to propose policy changes. Retrospective always has a facilitator, who sets the goal for the meeting and make sure that it will be achieved.

Facilitator has a crucial role to support participants to explore practical results that can enable future success. (Scaled Agile Frameworks 2023b; Loeffler 2017.)

Retrospective presents milestones of continuous improvement, and thus, holding this event makes the team to check whether they doing right things, whether right people are involved in the process, and whether policies are clear, and so on. Everyone has a chance to give feedback and ask if there are any unclarities. Scheduling time for reflection provides an opportunity to solve problems promptly which, once again, contributes to improving collaboration. (Loeffler 2017.)

4.5.3 Highlights from Improving Collaboration

As stressed by many business practitioners, the best way to prevent challenges in agile development is to communicate effectively across all team members and whole organization (Andersson & Carmichael 2016; Leopold and Kaltenecker 2015; Loeffler 2017, Scaled Agile Frameworks 2023b, etc.). Communication naturally happens in the different meetings called cadences and some crucial meetings that are suggested to be arranged when Kanban is utilized include:

First, Kanban meeting where the team can together walkthrough the backlog and work items in progress, check the WIP limits and pull new items to stages where there is free capacity available.

Second, Replenishment Meetings where work items are moved over the commitment point, and they can be arranged on the priority order waiting to be pulled upstream.

Third, Strategic Reviews where is possible to check that the strategy is aligned with the work items and team is still doing right things.

Fourth, Retrospective meetings where team member and the organization representatives can discuss the things that are working in the current model and what need to be improved. Result in the retrospectives is to come up with solutions and suggestions that need be improved and then continuously iterate them. Things can be related to the way of working, knowledge sharing, people involved in the process and so on.

Thus, based on the conclusions that business practitioners make that actively work with Kanban and Agile, creating agile environment and utilizing Kanban makes it easier to manage work. After that, people can self-organize around the Kanban. After flow of work is visualized on the Kanban board, regular cadences also known as meetings help to engage and determine what the team will be working with in the short and long-term. Cadences are also enabling knowledge sharing across the organization.

4.6 Conceptual Framework of This Thesis

Conceptual framework for this thesis focuses on four selected areas: Creating *Visualization and Transparency*, *Limiting Work-in-Progress*, *Creating Explicit Policies*, and *Improving Collaboration*. Adapting these elements to the upstream process in agile development requires Kanban utilization, as demonstrated by the entire existing knowledge section above.

The conceptual framework is summarized below in Figure 16.

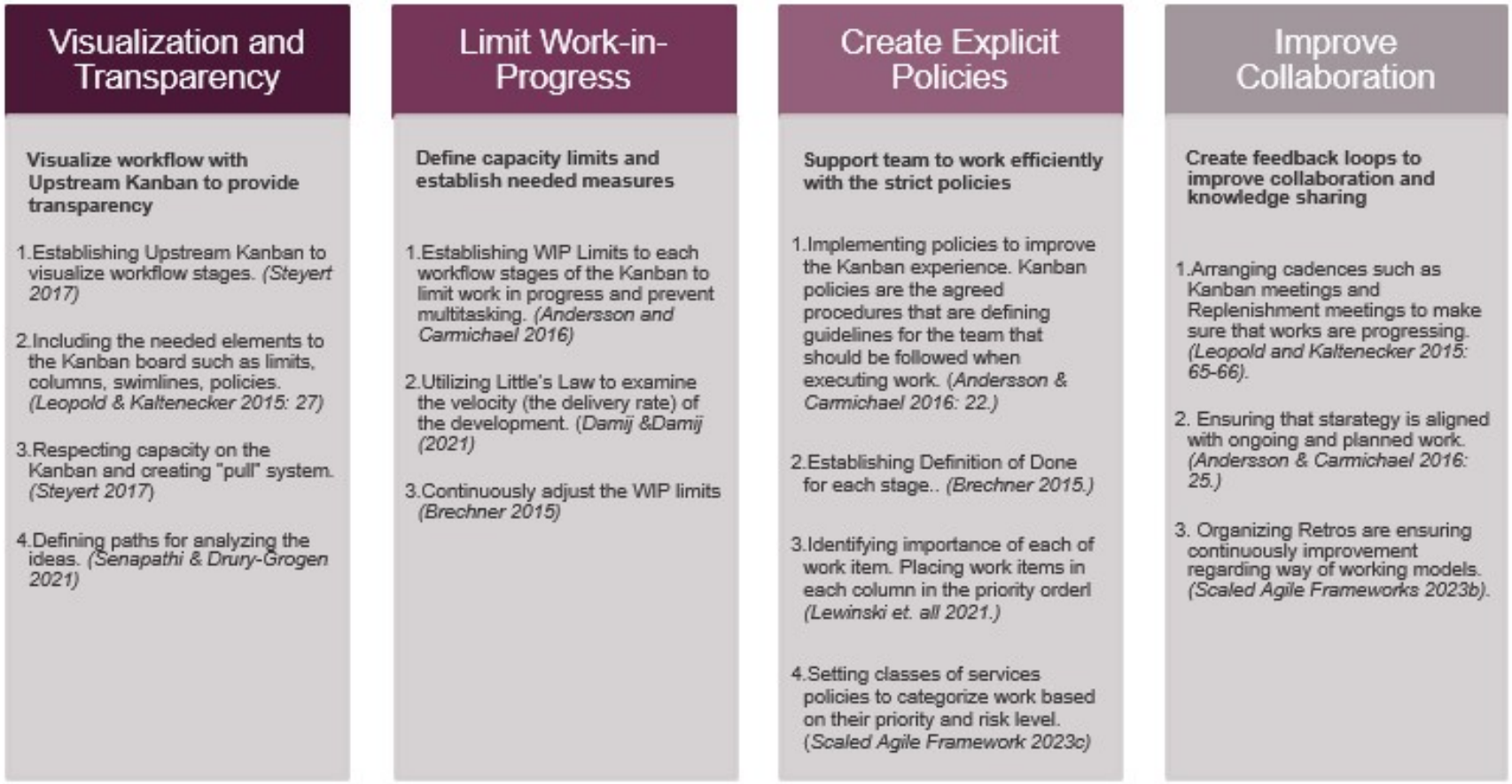

Figure 16. Conceptual framework for improving business agility with Upstream process.

As seen in Figure 16, this conceptual framework focuses on and highlights those key elements of the upstream process which are especially relevant for the improvement of the upstream process in the case organization of this thesis.

First selected element, *Creating visualization and transparency,* was explored via Kanban method and its utilization on a team level. The focus was to understand the principles of Upstream Kanban and the ways to model creative workflows, ideation, and concept refinement process. Second element, *Limit Work-In-Progress,* focused on understanding the flow of work item by providing limits to relieve Upstream Kanban from overburdening, to guarantee quality and velocity of the development items.

Third element, *Creating explicit policies,* focused on the rules and actions that are crucial to Kanban activities, so that continuous development and productive work can be guaranteed. Fourth element, *Improving collaboration,* focused on understanding the ways to communicate around Kanban activities across an organization.

By including these key elements to the upstream process, business agility at the case organization could be improved, as discussed later in Section 5.

In the next section, the proposal for the Visualized and Transparent Upstream Process for the Case Organization is built based on the existing knowledge and best practises discussed above.

5 Building Proposal for the Visualized and Transparent Upstream Process for the Case Organization

This section merges the results of the current state analysis, the existing knowledge and best practice from the conceptual framework towards building of the proposal for the upstream process, a solution that creates a consistent and visualized stream of ideas and defines stages for their refinement. The proposal is built based on co-creation and discussions with the case organization representatives and external stakeholders which were executed as part of the Data Collection 2.

5.1 Overview of the Proposal Building Stage

The goal of the improvements is to propose a concise set of actions that the case organization can follow to enhance the current upstream process to improve business agility.

The business challenge in the case organization is that company has taken in the use the new BSS with aim to have improved automation and enhanced delivering and maintenance capabilities in the long term. The constant stream of the development requests and feedbacks regarding the BSS is coming in, and it is difficult to maintain balance and manage the work on the top of the large funnel of development options. With the proposed improvements of this study the case organization can have more systematic and visual process to manage a large amount of incoming development requests, decide where to store them, define stages of the idea refinement and utilize t better process how these ideas can be prioritized to Agile Release Trains for actual implementation.

Based on the findings from the current state analysis as well as selected elements of literature and the best practice, the selected focus areas for building the proposal were addressed. The solution was to create a consistent and visualized stream of the ideas and defines stages of their refinement. The key elements for the solution were identified to be *Visualization and Transparency, Limiting Work-In-Progress, Creating Explicit Policies* and *Improving Collaboration* in different stages of upstream process.

For building the proposal first, the outcomes of the current state analysis and conceptual framework were analyzed, and the maturity level of the current upstream process was concluded. Second, the external stakeholders were interviewed to benchmark best

practices from other departments for the proposal. Third, the case organization´s representatives were interviewed to introduce draft of the proposal and to get the recommendations and inputs for the final refinement. Last, the Data 1 and Data 2 were utilized together to build proposal for the improvements to the current upstream process.

The Data collection 2 consisted of the interviews with the external stakeholders and the case organization representers which produced potential solutions and suggestions to the upstream process proposal. External stakeholders are the experts working in the other departments in the case company, while internal stakeholder or the case organization representatives are referred when person is working in the case organization. Data 2 input from the interviews are discussed in the next Section 5.2.

5.2 Findings from Data 2

Inputs for building the proposal included: (a) Data 1 findings from the current state analysis, (b) the conceptual framework and input from literature and best practices, and (c) Data 2 from the co-creation round.

Next, guided by this knowledge of Kanban best practices, Data collection 2 focused on brainstorming and identifying the best way of working methods for the upstream by benchmarking other departments via external stakeholder interviews and brainstorming solutions in interviews with the case organization representatives. Based on findings from Data 2 solution is proposed to improve current Upstream process across four key areas: *Visualization and Transparency, Limiting Work-In-Progress, Creating Explicit Policies and Improving Collaboration* in different stages of Upstream process.

Table 3 provides information of best practices that were identified in external stakeholders' interviews and recommendations from the case organization's representatives, these were co-created as part of Data 2. Best practices and recommendations are related first, the selected focus areas from current state analysis (Data 1) and second, to the inputs from literature.

Table 3. Key stakeholder suggestions (findings of Data 2) for Proposal building in relation to findings from the CSA (Data 1) and the Conceptual framework.

Key focus area from CSA (from Data 1)	*Input from literature (CF)*	*Suggestions from stakeholders for the Proposal, summary (from Data 2)*	*Description of their suggestion (in detail)*
Visualization and Transparency: Poor visibility to the workflow process, the existing development Items and their statuses.	Upstream Kanban can visualize the stages of the request from the idea to ready for implementation. Kanban supports team to perform better and provides transparency to development for the business unit employees and other stakeholders.	a) Utilize Mural as a visualization tool where to build Kanban b) Create systematic process around the Kanban. Define how communication and operations will be executed. c) Optimize the resources around Kanban activies.	a) Suggestion for the idea management tool was the Mural that has scalability for the larger amount of request and is well-known among the case organization. b) The stakeholders suggested to define process clearly to streamline communication and operations around Kanban. It was proposed to investigate as part of the analyses in the upstream that is the system development crucial or some of the development needs covered with process development. c) The stakeholders suggested to invite only necessary people to Kanban activities and utilize existing meetings.
Limit Work-in-Progress: No existing limits how many work items is handled or analyzed in parallel.	WIP limits makes team focus to smaller set of tasks at the time. Steady flow of the work items are coming ready to be pulled to downstream.	Limits are crucial to guarantee the flow of the work. WIP Limits are especially needed for the Concepting stage, where the work items are in progress longer.	One of the stakeholders suggested to set limits and adjust them occasionally. Otherwise, workflow would suffer about the parallel work.
Create Explicit Policies: Regularity and systemacity how the stages of the upstream process is executed is missing	Policies make definitions how work items are moving on the Kanban board, how urgency of the development items is illustrated, and how team is executing Kanban activities in the overall.	a) Defining policies via roles and responsiblities. b) Policies are needed how to handle urgency reguest should be defined	a) Recommendation from the stakeholders was to define clear roles based on the roles and responsibilities in the upstream to support the efficient working. b) The stakeholders also recommended having policies when there is coming some the urgency development items that needs immediate attention.
Collaboration in different stages of Upstream process Lack of discussions and internal resources especially in the concept refinement. Missing transparency to the existing development items and their status.	Different feedback loops are needed to manage team's work in upstream to improve transparency of the development across the case organization. Strategical alignment is needed. Regular checks guarantee that right thigs have been made in the development.	a) More business unit representatives need to be involved in the upstream to bring insights from daily work. b) Regular walkthroughs regarding items in the backlog is needed for people who not involved in the development and upstream process itself	The stakeholders suggested to involve idea provider to the discussions in the different stages of upstream process, then people would see how idea is refined and Upstream process is coming familiar. Switching the specialists in the different feedback loops was proposed, the different knowledge differs between peoples.

As seen from Table 3, first, the findings regarding Visualization and Transparency in the CSA requires building the Upstream Kanban where workflow stages can be illustrated. Hence, the stakeholders requested in Data 2 interviews that the Kanban would be created to an idea management tool Mural, that the case organization is already utilizing. JIRA was proposed as a secondary option for an idea management system. With the Kanban Visualization and Transparency focuses also to have a systematic process, streamlined communication and operations. The stakeholders highlighted that in addition having the visual Kanban, communication inside the team regarding development items and communication between other business unit representers is crucial, so that full benefit for Kanban can be achieved.

For example, from the literature and best practice, the most visible input was taken from Steyaert (2017) who introduced Upstream Kanban, that is a visual way to create consistent stream of the ideas and enable building an efficient delivery flow of work items. Stayaert visualized each stage of the workflow on the Kanban board to ensure continuous transition of validated option from Upstream Kanban to delivery workflow. The goal of the utilizing Upstream Kanban is to gain better understanding of end users or customers issues through exploring feedbacks. When variety of options are evaluated, they will be piece by piece transformed prepared work items. Best practices from Stayaerts Upstream Kanban model are adapted for building proposal of this study.

Second, the inputs from the case organization's representatives in the current state analysis and best practice researched as part of the literature highlights, how crucial it is to focus smaller set of tasks at the time to maintain the continuous workflow for the development items. As part of the Data 2 interviews one of the stakeholders also recommended strongly to set limits on the crucial stages of the workflow and adjust the limits occasionally.

Third, the findings related Creating explicit policies in the Current state analysis required a clarity and systematicity how stages of the upstream process are executed. In the co-creation the stakeholders also suggested to define clear Kanban policies starting how the development requests is added to the board and who is responsible to move items on the board. In addition to this some general rules were suggested to be defined including how to handle urgency items and what is Definition of Done for each stage. A common suggestion was that policies should be visible and everybody who is visiting on the Kanban board should easily understand the basic principles of it. Internal stakeholder stated:

> Policies should be explicit starting when development request or feedback is left to some of existing channels. Sender of the idea should be always informed when decision has been made to take idea forward or reject it. If the idea is proceeding in the development pipeline, the next steps should be clearly described and visible to everyone. If the sender's idea is accepted, she/he should be involved in discussions on later stages of upstream process. *(The case organization representative A).*

Fourth, the inputs from the stakeholders, which were identified as part of the current state analysis for Improving Collaboration in different stages of the upstream process require to set up regular meetings and walkthroughs. These would overcome main issue, lack of discussions around development requests. Furthermore, as part of the Data 2

interviews the stakeholders suggested that information about development process and development items in the backlog need be shared regularly across the case organization. Focus on improved collaboration is develop regular feedback loops that enables needed discussion and brings insights regarding development requests. The stakeholders supported an idea that the whole upstream process should be analyzed and elaborated continuously in retrospectives.

As recommended by the key stakeholders, the case organization needs to refine clear process and define its policies to overcome obstacles for improving business agility. These include providing holistic view to the development requests and process, enhancing velocity by focusing smaller set of work items at time, supporting team to work efficiently with same principles and ensuring quality of work items and knowledge sharing across the business unit.

5.3 Initial Proposal for Improvements to Enhance Upstream Process

Initial proposal is outcome of findings and evaluations that has been done across the selected four focus area of the Upstream process in which the case organization can improve business agility. Findings are collected from the current state analysis of Upstream process and identified as best practises from literature by Steyert (2017), Senapathi & Drury-Grogen (2021), Andersson and Carmichael (2016) and Damij & Damij (2021).

Evaluation of the four focus areas helped identify elements of the initial proposal: *Visualization and Transparency* that can provide holistic view to the development requests and whole Upstream process, *Limiting Work-in-Progress* that enhances velocity of work, when focus is on smaller set of items, *Creating Explicit policies* that supports team to work efficiently with same principles and *Improving Collaboration* that can ensure quality of work items and enhance knowledge sharing across the organization via different feedback loops.

Figure 17. represents overview of the improved Upstream process binding together the conceptual framework from the results of CSA, best practices from literature and co-creation with internal and external stakeholders in Data 2 collection.

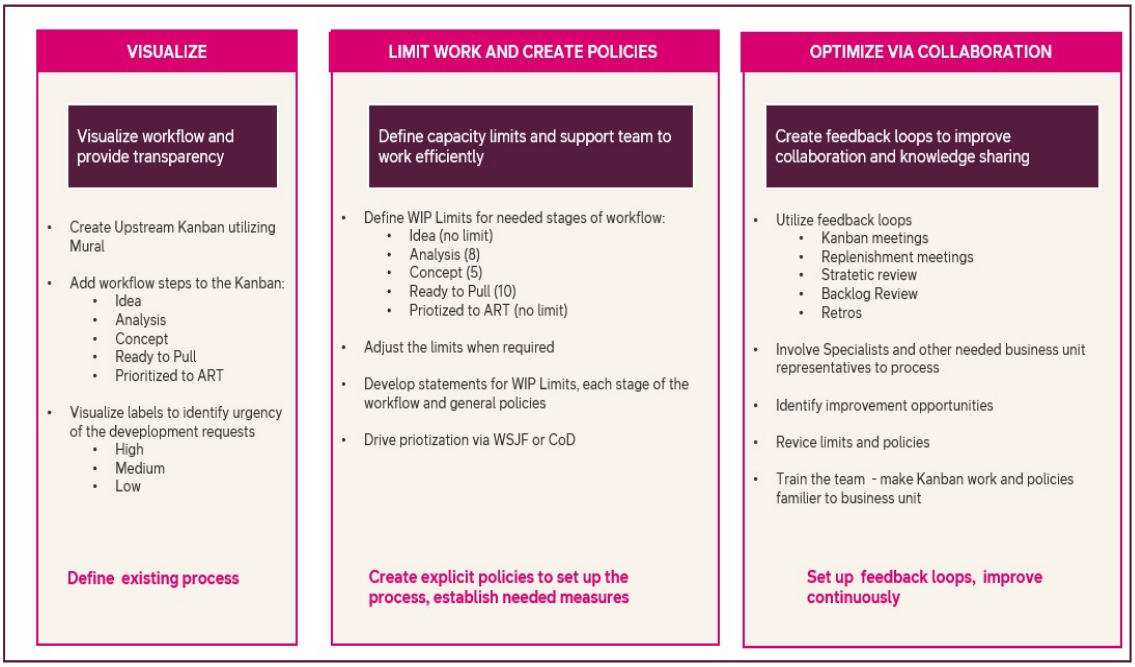

Figure 17. The proposal for the improvements to upstream process.

The four key elements regarding the proposal for improvements to the upstream process is described further in the next sections.

5.3.1 Proposal for Visualization and Transparency

The results of the interviews in the current state analysis proved that in many steps of the current upstream process visibility is missing and workflow stages are not clearly defined or understood among the case organization representatives. Transparency for the development ideas and feedbacks as well as their statuses is missing from employees, specialists, and supervisors. The idea management system were all ideas and feedbacks are collected is existing, but since stages of the process are not visualized, it is hard for people to organize work around it as well as interpret information from there. Both team members working with development ideas and other internal stakeholders in the case organization to whom knowledge sharing, and monitoring is crucial, wanted Improvements for the current state. With Upstream Kanban,

development requests and feedback are examined from end-to-end perspective, which bring greater value direct to end users and indirect to customers.

According to the existing knowledge and best practices, Upstream Kanban visualizes the stages of development requests from idea to ready for implementation work item. Kanban respects capacity and makes scheduling work easier with pull system. Defining analyzing paths and urgency for the development items also helps refining and prioritizing work. Everyone in the organization can see what kind of items are in the funnel waiting to get pulled for the next stage and status of items under progress can be easily seen. Proposal regarding visualization and transparency is to create Upstream Kanban, which workflow stages and their purpose has been defined in Table 4.

Table 4 visualizes the upstream process from Idea to Prioritized to ART. Development Manager coordinates refinement process through the Upstream Kanban. Analysis, Concept and Ready to Pull stages have WIP Limits.

Table 4. Proposal for stages of Upstream Kanban and explanation of their purpose.

Idea	Analysis (WIP)	Concept (WIP)	Ready to Pull (WIP)	Prioritized for ART
All ideas are welcome here regarding: • New business opportunities • Improved automation • BSS related enhancement (UI/UX) Urgency estimation is done in the idea stage	Refine understanding of the development idea or feedback Verify alignment with strategic themes Go/No-GO decision Triage definition	Collect input from end users and stakeholder Calculate CoD or business case Identify dependencies and risks Define MVP in high level if needed	Concept refinement is ready CoD or Business case is calculated WSJF is used for prioritization if needed	Prioritization is made and topic is approved to ART
Add idea to first stage from channels it has been provided	Pull when team has capacity to analyze Reject idea if not aligned to strategic themes	Pull when team has capacity to refine Reject idea if not approved	Pull when concept refinement is ready Reject idea if not relevant anymore Keep items in the priority order	Pull when capacity is available and prioritization is made Reject if idea is outdated

As seen in Table 4, in the *Idea stage* happens accumulation of ideas. Idea or feedback is landing on the Kanban from some of the current feedback channels. Exploration

happens during *Analysis stage* when Go/No-Go decision for developing item will be made and idea is analyzed into shape of more comprehensive request. In the analysis classes of service for the development item is decided. Inputs from end users and other stakeholders will be collected in the *Concept stage.* In the larger items Cost of Delay (CoD) or business case calculation is done to help on the prioritization on the later phases. When Concept refinement is ready work item is pulled to the *Ready to Pull stage,* that is behaving as inventory of the analyzed and concepted options waiting for prioritization to Agile Release Trains. *Prioritized for ART* is last stage, where the work item will be moved after the decision of the implementation has been made. Weighted Shortest Job First (WSJF) prioritization model can utilized, if prioritization cannot be done via discussion, Utilization of WSJF model was recommended by external stakeholder as part of Data 2.

The case organization can follow represented steps in the Kanban to improve visualization and to optimize teams' operation which will increase business agility.

5.3.2 Proposal for Limit Work-in-Progress

The findings from the CSA showed that as a part of the current upstream process there is accumulated too much ongoing development requests, which make it difficult to manage the flow of work. The current upstream process has no capacity limits how many parallel development requests team should work with.

Based on the best practices that were researched as part of the literature review, Kanban focuses the continuous flow of work. By utilizing WIP Limits team can ensure that there is suitable amount of work items in progress. The new work items can be pulled when the stage has capacity available. When parallel work is limited team focuses on a smaller set of work items that improves a quality and velocity. Limiting parallel work also increases amount of completed work items. Having capacity limits in the upstream Kanban prevent overproduction of the ideas which cannot be prioritized in delivery workflow anyway, because delivery workflow has its own capacity limits. External stakeholder who was interviewed as part of the Data 2 especially suggested to use WIP Limits with the Upstream Kanban.

The Current state analysis, literature review as well as suggestions from Data 2 determined that utilizing WIP Limits can have a great impact for managing the flow of

work. WIP Limits presented in the Table 5 are proposed to use with the Upstream Kanban to improve a continuous workflow.

Table 5. Proposal for the WIP Limits to Upstream Kanban.

Idea	Analysis	Concept	Ready to Pull	Prioritized for ART
No WIP limit	WIP Limit is 8	WIP Limit is 5	WIP limit is 10	No WIP limit
Stage can have unlimited number of development items	WIP limits prevent stage from overburdening New work items can be pulled when stage has free capacity	WIP limits prevent stage from overburdening and makes team to focus items in progress New work items can be pulled when stage has free capacity	WIP limits prevent stage from overburdening. New work items can be pulled when stage has free capacity	Stage can have unlimited number of development items

As seen in Table 5, *Idea stage* does not have the WIP Limit since there can be unlimited number of the work items in the funnel. In *Analysis stage* the WIP Limit is proposed to be eight. Purpose of the WIP limit is pick items from Idea stage based on the importance and time sensitivity. If WIP Limit is too high, ideas are waiting on the stage for a long period of time, what is not purpose in the Kanban work, where the items should create a continuous flow. WIP limit in *Concept stage* is proposed to be five. Conception has the lowest WIP limit because especially with the bigger items a lot of exploration is needed to collect input, identify risks and define possible MVP solutions. Because of this only limited number of items can concepted in parallel. *Ready to Pull* stage's WIP Limit is proposed to be 10. Purpose of the limit is ensured that items are constantly pulled to the delivery workflow. *Prioritized to ART stage* acts as a storage for items that have moved to the delivery workflow, and that way does not have a WIP Limit.

The case organization can utilize represented WIP limits in the Kanban's workflow stages. Defining capacity limit for crucial stages of the Upstream teams' operation can be optimized which will improve business agility.

5.3.3 Proposal for Creating Explicit Policies

According to the interviews executed as part of the current state analysis, Data 1 collection round, the case organization is following some routines when working in the upstream, but there are no explicit policies which are supporting the efficient way of working. The clear policies and systematicity are needed to especially define the roles and the responsibilities in the upstream process.

Furthermore, a systematic approach for working at each stage of the workflow was suggested as part of the Data 2 interviews. In the interviews was highlighted that employees involved in the discussions in the Analysis, Concept and Ready to Pull stages should be chosen based on the topic that is handled. It was also suggested that Idea provider is involved in the discussion when she or he has opportunity to justify the need for the development.

Literature regarding Kanban's explicit policies underlined that Kanban method does not prescribe what need to be done in each stage of the workflow. Team itself need to decide the most efficient ways, so that work items keep floating. Defining policies make everyone easy to understand what needs to happen in each stage of the process and who is responsible for which task. Moreover, confusions and uncertainly is reduced which leads workflow consistency.

Policies for the each of the workflow stage has been proposed in the Table 6. Policies are described via roles and responsibilities. Table also presents Definition of Done for each step.

Table 6. Proposal for the roles, responsibilities and Definition of Done for each workflow stage of the Upstream.

	Idea	Analysis	Concept	Ready to Pull	Prioritized for ART
Employee (Idea provider)	Message to inform that idea is received and short description of the next steps	Can involved in the decision making	Can involved in the conception	Can involved in the prioritization	Can view the information
Specialists	Can place ideas to an idea management system on behalf employee/customer	Involved in the decision making	Involved in the conception	Involved in prioritization	Can view the information
Development Manager	Correspond adding the ideas from idea forum and webform to an idea management system	Correspond that definition of done is reached Arrange needed meetings	Correspond that definition of done is reached. Arrange needed meetings	Correspond that definition of done is reached. Arrange needed meetings	Manages the information
Definition of Done	Idea is described in the high level Idea provider is marked Priority for the idea is given	Context of the idea is understood Go/NoGo decision is made Triage definition is done Strategy alignment is verified	Inputs are collected from stakeholders CoD or business case is calculated Risk and dependencies are identified MVP is defined, when needed	Priority based on the other items in the column is defined WSJF is used in prioritization if needed	Work item is priorized to ART and is assigned to Program Increment

As seen in Table 6, the explicit policies regarding roles and responsibilities are describing what is expected for different persons involved in Kanban activities. The Idea provider is always informed, when the idea is received, and she or he can be involved to discussions in other stages if the idea is proceeding to development. Senior and Process specialists can add the ideas to the Kanban board on behalf of customer or end user and they are involved in the discussions at each stage to bring input from end users and daily operations. Development Manager has overall responsibility of the upstream process and its policies. Development Manager also corresponds that work items are reaching definition of done.

In addition to the policies that support team to follow and act in different stages in Kanban, some general rules are needed to guide actions around Kanban. These policies are described in Table 7.

Table 7. Proposal of general Kanban and Upstream process related policies.

Policy	Definition
Choosing ideas for analysis	Ideas are chosen to Analysis based on their urgency starting from high priority items. If many of the items has same urgency label, team decides which items are pulled to Analysis first. Urgency labels are set to development ideas by the team in the separate meetings.
Handling critical requests	Critical requests are handled in their own swim line based on class of services guidance. Critical requests are always prioritized in Upstream handling.
Definition of Done	Each stage has its definition of done which has been described in Table 6. When DoD is reached, work item is ready to pull on the next stage. Done labels help users to identify when item is ready to pull to the next stage.
Handle impediments	Impediments and blockers regarding work item are visualized in the Kanban with own label. Development Manager is responsible to resolve issue.
Moving work items on the Kanban board	Development Manager corresponds moving work items on the Kanban board.

As seen in Table 7 above, general policies include definitions choosing ideas to Analysis, handling critical requests, identifying done items, handling impediments, and moving items on the Kanban. As part of data collection one of the stakeholders proposed especially define the policies how to handle the urgency or critical items, which needs immediate attention. When policies have been decided in the advance, it is easier overcome the situation.

The case organization can utilize represented policies in the Kanban's workflow stages and in general Kanban activities. Defining the strict policies for the upstream process teams' operation can be optimized which will improve business agility.

5.3.4 Proposals for Improving Collaboration

According to the interviews as part of Data 1 with the stakeholders, the current upstream process has lack of discussions and participation in the different stages of the process is limited. The stakeholders recommended that more people in the different positions are involved on the discussions and decision making. This helps team to elaborate the best possible solutions, which can deliver better value to end users. As a part of co-creating proposal in Data 2 interviews, the case organization's representative highlighted that:

> A close collaboration is needed among team working with development items as well as between team and other business unit. Employees involved in discussions should be rotated regularly, because not all people have the same knowledge. Person should be involved for example in the Concept refinement based on the knowledge, not based on the title or position. (The case organization representative).

Furthermore, as part of Data 2 discussions the stakeholders embraced value of knowledge sharing among the case organization. Strategic alignment with managerial level, backlog walkthroughs and reviews in employee level provides information to business unit and gives opportunity to ask and question decisions related to development items.

Based on the existing knowledge and best practices, different discussions around Kanban activities called as feedback loops or cadences, are the best way to prevent challenges in an agile working environment and communicate effectively across all the team members and whole organization. When communication and collaboration is maintained throughout the upstream process, it increases quality of the development items which reflects to end user experience and satisfaction. Table 8 illustrates feedback loops that are proposed to use as part of the enhanced upstream process to improve continuous workflow.

Table 8. Proposal for the meetings to be held in the upstream process.

Feedback loop	Stage/Stages	Main Purpose	Participants	Cycle
Kanban meeting	Idea, Analysis, Concept	**Idea stage**: Review items and set priority for new requests **Analysis stage**: Make Go/No-Go decision, Understand context **Concept stage:** Status review, elaborate items in progress	Development Manager Process Specialists Senior Specialists (when invited) Idea provider (when invited)	Weekly • Biweekly focus is on Idea and Analysis stage • Biweekly focus is on Concept stage
Replenishment meeting	Ready to Pull	Prioritize the items and discuss which would be prioritized to ART next Execute WSJF practise if needed	Development Manager Process Specialists	Monthly
Strategic review	-	Align company's startegy and ART OKRs to development roadmap and initiatives	Development Manager Head of the Departments	Once in a half year
Backlog Review	-	Introduce development items and their statuses on the Kanban	Development Manager Process Specialists Senior Specialists Supervisors	Once in a quarter
Retrospective	-	Identify improvements opportunities. Get inputs what is working currently what are the issues and bottlenecks	Development Manager Process Specialists Senior Specialists Supervisors	Once in a half

As seen in Table 8. Four regular meetings are proposed to include in the upstream process to improve collaboration. In weekly *Kanban meetings* team walk through the idea stage and set priorities for the new development requests and feedbacks. For items in the Analysis, team will clarify the need of development and makes Go or No-Go decisions. Items in Idea and Analysis stage will have walkthrough bi-weekly. Every other week team will utilize for reviewing and refining items in the Concept stage. Monthly *Replenishment meetings* are set to prioritize items in the inventory, where they are waiting to be pulled Agile Release Trains. *Strategic Reviews* are held in the beginning of every half. Purpose of the meeting is to ensure that expectations coming from company's

and the case organization's strategy are aligned with the planned development actions and ongoing work.

Backlog Reviews are held once in the quarter to introduce funnel of the development items and work items in progress to the larger audience in the case organization. This need was especially highlighted in the interviews executed as part of Data 1. *Retrospectives* are opportunity to team revisit the current process and identify possible obstacles and bottlenecks. Overcoming issues frequently, team can ensure continuous improvement.

The case organization can utilize represented feedback loops to improve collaboration in the different stages of upstream process. Utilizing feedback loops as part of the upstream process teams' and the case organization's operation can be optimized which improves business agility.

5.4 Summary of the Initial Proposal

This section summarizes the four key elements regarding improvements that enhances the upstream process in the case organization. Improvements are based on the findings in the Current state analysis (Data 1), best practised find from literature and suggestions and proposals from the stakeholders collected in Data 2. Table 9 represents the initial proposal of the improvements for the current upstream process.

The proposal for improving the upstream process with the four key elements is built by including proposal suggestions in the sing view.

Table 9. The initial proposal for the improvements that enhance the upstream process.

WORKFLOW STAGE	VISUALIZE	LIMIT WIP	DEFINITION OF DONE	POLICIES	FEEDBACK LOOPS	PARTICIPANTS
Idea	All ideas are welcome. Urgency estimation is done in the idea stage	No WIP Limit	Idea is described in the high level Idea provider is market Priority for the idea is given	Idea provider is informed when idea is received Specialists can place ideas to Kanban behalf of customer/end user DM places ideas to Kanban from “Idea forum” and Webform	Kanban meeting (Bi-weekly)	Development Manager Process Specialists Senior Specialists (with invation)
Analysis	Refine understanding of the development idea or feedback Verify need and alignment with strategic themes Go/No-Go decision Triage definition (Standard, Expediate, Fixed date)	WIP Limit 8	Context of the idea is understood Go/No-Go decision is made Triage definition is done	DM Corresponds that definion of done is reached DM Arranges needed meetings		Development Manager Process Specialists Senior Specialists (when invited) Idea provider (when invited)
Concept	Collect input from ends users and stakeholders Refine cost estimates or business case when needed Identify dependencies and risks Define MVP if needed	WIP Limit 5	Input is collected from stakeholders CoD or business case is calculated Risk and dependencies are identified MVP is defined when needed	DM Corresponds that definion of done is reached DM Arranges needed meetings	Kanban meeting (Bi-weekly)	

Ready to Pull	Concept refinement is ready WSJF calculation supports prioritization	WIP Limit 10	Priority is defined WSJF is utilized if needed	DM Corresponds that definition of done is reached DM Arranges needed meetings	Replenishment meeting (Monthly)	Development Manager Process Specialists Senior Specialists (when invited)
Prioritized to ART	Prioritization is made and topic is approved to ART	No WIP Limit	Work item is prioritized to ART and is assigned to Program Increment	Work items prioritized to ART can be viewed by any business unit representer	-	-
General	Defining analyzing paths and urgency for the development items helps refining and priorizing work.	-	Development Manager corresponds moving work items in the board when definition of done is reached and next stage has free capacity	High level development roadmap is agreed with Head of Departments, Aligned to company's strategy. Team shares knowledge, what is happening in the development Critical requests have their own slimline in Kanban Impediments and blockers are marked with labels. DM is responsible to solve issues.	Strategic Review (Every half) Backlog Review (Every quarter) Retrospectives (Every half)	Development Manager Head of the Departments Development Manager Process Specialists Senior Specialists Supervisors

As seen in Table 9, in the proposal five first rows represent Kanban's workflow steps. Purpose of each stage, its WIP Limit, Definition of Done, Policies, Feedback loops and participants of Feedback loops is described in each column. Last row of the table illustrates general policies, rules, and meetings as well as participants of this meetings, which are not related any of the stage. The proposal indicates the needs and goals of the case organization and provides a clear framework for the upstream process execution.

The proposal is validated by the case organization's representatives and the Product Management experts. Results of the validation stage and the final proposal is discussed in the following section.

6 Validation of the Proposal

This section reports the results of validation regarding the initial proposal that was presented in Section 5. First, overview of the validation stage introduces a logic how the validation process is executed. Second, the findings from Data collection 3 and development recommendations to the initial proposal are discussed via each of the key element. At the end of this section, the Final proposal and further recommendations for the action plan are presented.

6.1 Overview of the Validation Stage

The purpose and the goal of the validation stage was to evaluate the improvements that was proposed to enhance the upstream process in Section 5. The improvements that enhance the upstream process was presented to the stakeholders to ensure that the proposed solution is applicable and to get recommendations for building the final proposal. The key stakeholders (expert judgement) were used for validation of this study.

The validation stage focused on four key elements of the proposal: *Visualization and Transparency*, *Limiting Work-in-Progress*, *Creating Explicit Policies* and *Improving Collaboration* in different stages of the upstream process. Furthermore, the overall structure of the Thesis was introduced to the stakeholders to provide general knowledge about the research, its output and benefit to the case organization.

The internal and external key stakeholders were involved in the validation. Internal key stakeholders represented the case organization while external stakeholders represented the Product Management experts of the Corporate Business. Further recommendations for the initial proposal were collected and analyzed as part of the Data 3, and they were the foundation for the final proposal. All recommendations from the stakeholders related to the four key elements of the upstream process proposal were evaluated together during discussion and they were noted as a further improvement needs in building the final proposal.

The validation included two separate workshops and analysis of the recommendations and findings. First, the initial proposal was presented to the case organization’s representatives. Vice President, Head of Departments, Supervisors and Specialists

represented the case organization in this workshop. The stakeholders highlighted valuable insights from the different perspectives taking in the account resources, common working methods and tools as well as guaranteeing crucial communication and information sharing during the process.

Second, the initial proposal was presented to two external stakeholders representing Product Management. Their expertise in agile way of working enabled insights and suggestions how the proposed upstream process could be combined with the downstream and what actions would support more efficient working there.

Third, the recommendations from all stakeholders related to the four key element of the upstream process were analyzed and evaluated during discussions and they were noted as a further improvement needs in building final proposal. Based on these suggestions, the final proposal for improvements that enhance the upstream process was created.

6.2 Developments to the Proposal Based on Findings of Data Collection 3

Data Collection 3 concentrates on identifying the improvements and developments that the stakeholders were proposed during validation of the initial proposal. The key stakeholder's feedback that was collected in Data 3 guided building the final proposal.

Table 10 below, shows inputs for the initial proposal that were collected in the two separate workshop sessions. These inputs are related to the four key elements of the proposal: *Visualization and Transparency, Limiting Work-In-Progress, Creating Explicit Policies* and *Improving Collaboration.*

Table 10. Expert suggestions (findings of Data 3) for the Initial proposal.

Element of the Initial proposal	*Parts commented in Validation*	*Description of the comment by expert*	*Development to the Initial proposal*
1. Visualization and Transparency	a) Visualize discarded work items and define reason for NoGo decision	Supervisor of the case organization suggested that discarded development items should be visible to all employees, and it should be possible to view reason for the rejection	Add additional column for the Discarded items.
	b) Group similar work items in the Idea stage	The experts highlighted that lot of similar ideas can come in and it is important to group these items together	Group items in the Idea stage, when similar or duplicate ideas are identified
	c) Utilizing Jira as an idea management tool instead of Mural	The experts embraced that Jira has better scalability for the larger amount of work items compering to Mural. Jira has a lot of functionalities, and it enables different measuring if needed.	Creating Upstream Kanban to Jira
2. Limit Work-in-Progress	a) Measuring lead time of the work item in Upstream Kanban	Vice President of the business unit asked that what is lead time of the work item in Upstream and is it possible to measure.	Lead time measurement will be added to Kanban activities
3. Create Explicit Policies	a) There should be solid way to prioritize work items with different sizes.	The experts suggested to think ways how to prioritize different size of work items against each other's.	Prioritization will be made through discussions.
	b) Defining business case or Cost of Delay is beneficia in Downstream	The experts recommended that in the Concept stage business case or CoD would always be calculated, since it help to prioritize work item in Upstream but later in downstream.	Business case or CoD calculation is mandatory in Concept refinement stage
	c) Need for triage definition should be reconsidered since urgency of the items will be defined anyway	The experts suggested to consider need for the triage definition since work items are marked based on their urgency in the Idea stage.	Triage definition will not be used on Kanban. Usage of it can be considered later if needed.
4. Improve Collaboration	a) Weekly Kanban meetings might be too often, and instead bi-weekly meetings should be considered.	Development Manager suggested to consider cycle of the Kanban meetings. Since a very limited number of the work items can be pulled to the downstream, bi-weekly meetings should be enough prepare items in the upstream.	Kanban meetings will be arranged biweekly.

As seen from Table 10 above, each of the key elements received the development proposals. The overall feedback for the initial proposal was that the process and policies

are systematic, thus created framework could be utilized more broadly inside the case organization but also in the other business units and departments. Vice President of the case organization encapsulated:

> The proposal is well-structured, and it can be utilized wider inside our business unit and other stakeholders could also benefit from the working model. So, I hope this proposal can be presented to all interested stakeholders. *(Vice President of the case organization)*

In the following sub-sections feedbacks and recommendations received from the stakeholders is examined in more detail through the key elements of the proposal.

6.2.1 Developments to Visualization and Transparency

The first key element, Visualization and Transparency in the upstream process was discussed with the stakeholders, and it was mutually agreed to include the presented workflow stages to the final proposal. General ideology of the Upstream Kanban was also presented to the key stakeholders during the validation workshop.

Table 11 below describes refined workflow stages on Kanban and description of their main purpose.

Table 11. Stages of the Upstream Kanban and description of their purpose developments recommendation included.

Idea	Analysis (WIP)	Concept (WIP)	Ready to Pull (WIP)	Prioritized for ART	Discarded
All ideas are welcome here regarding: • New business opportunities • Improved automation • BSS related enhancement (UI/UX) Urgency estimation is done in the idea stage Similar ideas are grouped as entity	Refine understanding of the development idea or feedback Verify alignment with strategic themes Go/No-GO decision	Collect input from end users and stakeholder Calculate CoD or business case Identify dependencies and risks Define MVP in high level if needed	Concept refinement is ready CoD or Business case is calculated	Prioritization is made and topic is approved to ART	Work item has No-Go decision in the Analysis and is then moved to the Discarded stage
Add idea to first stage from channels it has been provided	Pull when team has capacity to analyze Reject idea if not aligned to strategic themes	Pull when team has capacity to refine Reject idea if not approved	Pull when concept refinement is ready Reject idea if not relevant anymore Keep items in the priority order	Pull when capacity is available, and prioritization is made Reject if idea is outdated	Move idea here when NoGo decision is made Reason for rejection is always written in the work item

As seen in Table 11, the stakeholders' suggestions regarding Visualization and Transparency have been included to the proposal. Based on the case organization's Supervisor's recommendation, one additional stage was included in the Kanban for discarded work items. Otherwise, the key stakeholders agreed that the initial proposal included comprehensive plan to create the Upstream Kanban and it defined clear workflow stages for the idea refinement. Descriptions of the purpose for each workflow stage was specific and that was though to help the users interpret work items' status in Kanban. Head of the Department encapsulated:

> Workflows and their descriptions seem to be a very clear and they have been chosen with justified reason. When each of stage has purpose and goal, what need to be achieved during the stage, it makes employees easy to work around Kanban activities*. (Head of The Department, the case organization)*

One of the experts highlighted that there could come a lot of similar ideas or ideas that are related to some of the existing request or work item. Grouping them as an entity in early stage is important so that all issues and pain points concerning a certain area can be considered in the development. Grouping the items was noted when building final proposal.

The most significant recommendation regarding Visualization and Transparency was utilizing Jira instead Mural as an idea management tool. Especially Product Management emphasized that *"..the most favorable environment for managing constant stream of ideas is Jira, which has large scale of capabilities"* and since downstream Kanban is managed there it is making sense that whole end-to-end flow is managed inside the same tool.

In addition to this WSJF prioritization method was removed from the Ready to Pull stage. Method requires job estimate, that will be done when work item is pulled in the downstream. Hence, there is no reliable way to do WSJF estimations in the upstream. This attention was made by one of the external stakeholders.

6.2.2 Developments to Limiting Work-in-Progress

The second key element, Limiting Work-in-Progress was agreed to be included in the upstream process. The stakeholders stated that utilizing limits most likely encourages

higher quality of work items and improves end-to-end lead time. One of the experts encapsulated that:

> I think it is a very common problem that teams, departments and business units have too much parallel activities what means, that they are working with many items, and nothing get completed instead of working with limited number of initiatives which gets completed. Working limits for sure improves productivity and they are crucial on Kanban activities. *(Expert, Product Management)*

Table 12 below has workflow stages on Kanban including their WIP Limits.

Table 12. WIP Limits to Upstream Kanban developments recommendations included.

Idea	Analysis	Concept	Ready to Pull	Prioritized for ART	Discarded
No WIP limit	WIP Limit is 8	WIP Limit is 5	WIP limit is 10	No WIP limit	No WIP Limit
Stage can have unlimited number of development items	WIP limits prevent stage from overburdening New work items can be pulled when stage has free capacity Calculation of lead time starts	WIP limits prevent stage from overburdening and makes team to focus items in progress New work items can be pulled when stage has free capacity	WIP limits prevent stage from overburdening. New work items can be pulled when stage has free capacity Calculation of lead time ends	Stage can have unlimited number of development items	Stage can have unlimited number of development items

As seen in Table 12, few enhancements were added as developments to the initial proposal. Vice President of the case organization was interested to know what would be approximately lead time for single work item in the Upstream Kanban. This suggestion was noted and calculating lead time in the upstream was included in the process. Based on the discussions with the stakeholders, lead time was agreed to be started when item is pulled in the Analysis stage and after going through the Analysis and Concept stages work item has accumulated lead time when moved to Ready to Pull stage. Jira, where the Upstream Kanban is managed has capability to calculate lead time.

6.2.3 Developments to Creating Explicit Policies

The third key element, *Creating explicit policies* was agreed to be included in the upstream process. Policies for each of stage and role was presented to the stakeholders and they are shown in Table 13.

Table 13. Explicit policies to the upstream process developments recommendation included.

	Idea	Analysis	Concept	Ready to Pull	Prioritized for ART	Discarded
Employee (Idea provider)	Message to inform that idea is received and short description of the next steps	Can involved in the decision making	Can involved in the conception	Can be involved in the prioritization	Can view the information	Can view reason for NoGo decision Get informed when idea is discarded
Specialists	Can place ideas to idea management system on behalf employee/customer	Involved in the decision making	Involved in the conception	Involved in prioritization	Can view the information	Can view the information
Development Manager	Correspond adding ideas from idea forum and webform to idea management system	Correspond that definition of done is reached Arrange needed meetings	Correspond that definition of done is reached. Arrange needed meetings	Correspond that definition of done is reached. Arrange needed meetings	Manages the information	Add reason for NoGo decision to Work item
Definition of Done	Idea is described in the high level Idea provider is marked Priority for the idea is given	Context of the idea is understood Go/NoGo decision is made Strategy alignment is verified	Inputs are collected from stakeholders CoD or business case is calculated Risk and dependencies are identified MVP is defined, when needed	Priority based on the other items in the column is defined	Work item is priorized to ART and is assigned to Program Increment	Reason for rejection is written in the work item

Table 13 above shows the initial proposal that has been enhanced with development recommendations identified in the validation stage. As seen in Table 13 Discarded column has been added there and policies regarding stage has been defined. Idea provider gets informed when her or his idea is rejected and all discarded items have explicit reason for NoGo decision, which everyone can view. Moreover, triage definition has been removed to be one of the Definition of Done elements in Analysis stage. Proposal from the stakeholders was that since on the Idea stage work items are marked based on the urgency, it is not necessary to use separate triage definition.

Recommendations was also given regarding prioritization. The Product Management experts highlighted especially importance of business case or Cost of Delay calculations in the Concept stage:

> Every work item should have benefit and value described and for example business case calculation can embrace this. Having business case will help team to prioritize items in the Upstream but it will also help Product Management to prioritize work items in the downstream when there are multiple different items from different business units in one backlog. (Product Management Expert A)

Other point regarding the prioritization was brought up by Head of the Department. Since work items going through the upstream process might vary a lot from small configuration changes to totally new automated functionalities, it might be difficult to prioritize different size of work items against each other's. Based on the discussion with the key stakeholders during the workshop the best way to prioritize work items in the upstream is through discussion. Team needs to together think about the benefit of outcome and time what implementation takes. Some quick wins are smart to be merged between the bigger development initiatives, so that some output can be achieved for end users.

In addition to the policies that support team to follow and act in different stages, some general rules are guiding actions around Kanban. These policies were refined based on the discussion with the stakeholder and are described in Table 14.

Table 14. General Kanban and the upstream process related policies developments included

Policy	Definition
Choosing ideas for analysis	Ideas are chosen to Analysis based on their priority starting from high priority items. If many of the items has same priority label, team decides which items are pulled to Analysis first. Priorities are set to development ideas by the team in the separate meetings.
Handling critical requests	Critical requests get high priority on the Idea stage and they are always prioritized in Upstream handling.
Definition of Done	Each stage has its definition of done which has been described in Table 13. When DoD is reached, work item is ready to pull on the next stage. Done labels help users to identify when item is ready to pull to the next stage.
Handle impediments	Impediments and blockers regarding work item are visualized in the Kanban with own label. Development Manager is responsible to resolve issue.
Moving work items on the Kanban board	Development Manager corresponds moving work items on the Kanban board.

The recommendations from the key stakeholders refined the policies and unnecessary steps were be removed from the process. Handling of critical request was updated based on decision that triage definition is not used in the upstream. After small refinement also these general policies are better supporting team successfully execute work in the upstream.

6.2.4 Developments to Improving Collaboration

The fourth key element of stakeholder's recommendations relates to proposed improvements for Collaboration in different stages of the upstream process. The suggestion for the feedback loops and their cycles that can improve collaboration during the upstream process were approved by the stakeholders in the initial proposal evaluation with a few notes.

Table 15 below illustrates the refined feedbacks loops.

Table 15. Meetings that can improve collaboration in the upstream process including developments.

Feedback loop	Stage/Stages	Main Purpose	Participants	Cycle
Kanban meeting	Idea, Analysis, Concept	**Idea stage**: Review items and set priority for new requests **Analysis stage**: Make Go/No-Go decision, Understand context **Concept stage:** Status review, elaborate items in progress	Development Manager Process Specialists Senior Specialists (when invited) Idea provider (when invited)	Bi-Weekly • Every second time focus is on Idea and Analysis stage • Every second time focus is on Concept stage
Replenishment meeting	Ready to Pull	Prioritize the items and discuss ART prioritization	Development Manager Process Specialists	Monthly
Strategic review	-	Align company's strategy and ART OKRs to development roadmap and initiatives	Development Manager Head of the Departments	Once in a half year
Backlog Review	-	Introduce development items and their statuses on the Kanban	Development Manager Process Specialists Senior Specialists Supervisors	Once in a quarter
Retrospective	-	Identify improvements opportunities. Get inputs what is working currently what are the issues and bottlenecks	Development Manager Process Specialists Senior Specialists Supervisors	Once in a half

As seen from Table 15, only one refinement was made compering to the initial proposal. Development Manager of the case organization brough up that amount how many development items can be handled in the downstream is minor, so it might be unnecessary to have Kanban meetings weekly. Instead of having weekly meetings he suggested to have bi-weekly meetings in the beginning and then adjust cycle of them if needed. This way also resources could be optimized better. The recommendation got support from the other stakeholders.

The concept of including more Specialists and idea provider into discussions in the different stages was perceived positively. Participation for needed parties was embraced to be one of the most important prerequisites to achieve quality of the work items.

6.3 Final Proposal

Based on the key findings from the Current State Analysis, Conceptual Framework and recommendations that were received during building and validating the initial proposal, the final proposal for the improvements that enhances the upstream process was concluded.

The final proposal for the improvements that will enhance Upstream process is presented in Table 16 below.

Table 16. The final proposal

STAGE	VISUALIZE	LIMIT WIP	DEFINITION OF DONE	POLICIES	FEEDBACK LOOPS	PARTICIPANTS
Idea	All ideas are welcome here regarding: • New business opportunities • Improved automation suggestions • BSS related UI/UX enhancements • New features Urgency estimation is done in the idea stage (High, Medium, Low)	No WIP Limit	Idea is described in the high level Idea provider is market Priority for the idea is given	Idea provider is informed when idea is received Specialists can place ideas to Kanban behalf of customer/end user. DM places ideas to Kanban from Idea forum and Webform	Kanban meeting (Bi-weekly)	Development Manager Process Specialists Senior Specialists (when invated)
Analysis	Refine understanding of the development idea or feedback Verify need and alignment with strategic themes Go/No-Go decision	WIP Limit 8	Context of the idea is understood Go/No-Go decision is made	DM Correspond that definition of done is reached DM Arrange needed meetings		Development Manager Process Specialists Senior Specialists (when invited) Idea provider (when invited)
Concept	Collect input from ends users and stakeholders Refine cost estimates or business case when needed Identify dependencies and risks Define MVP if needed	WIP Limit 5	Input is collected from stakeholders Calculate CoD or business case Risk and dependencies are identified MVP is defined when needed	DM Correspond that definition of done is reached DM Arranges needed meetings	Kanban meeting (Bi-weekly)	

Ready to Pull	Concept refinement is ready CoD or Business case is calculated	WIP Limit 10	Prioritization is made and topic is approved to ART	DM Correspond that definition of done is reached DM Arrange needed meetings	Replenishment meeting (Monthly)	Development Manager Process Specialists Senior Specialists (when invited)
Prioritized to ART	Prioritization is made and topic is approved to ART	No WIP Limit	Work item is prioritized to ART and is assigned to Program Increment	Work items priorities to ART can be viewed by any business unit representer	-	-
Discarded	Work item has No-Go decision in the Analysis and is then moved to the Discarded stage	NO WIP Limit	Reason for rejection is written in the work item	DM Correspond that definion of done is reached	-	-
General	Defining analyzing paths and urgency for the development items helps refining and priorizing work.	-	Development Manager corresponds moving work items in the board when definition of done is reached and next stage has free capacity	High level development roadmap is agreed with Head of Departments, Alignmed to company's starategy. Team shares knowledge, what is happening in the development Impediments and blockers are marked with labels. DM is responsible to solve issues.	Strategic Review (Every half) Backlog Review (Every quarter) Retrospectives (Every half)	Development Manager Head of the Departments Development Manager Process Specialists Senior Specialists Supervisors

As seen in Table 16, the final proposal includes the key elements of the improvements that enhances the current upstream process in the case organization. The developments for the final proposal were made based on the workshops executed with the case organization representers and the experts from Product Managements.

The final proposal describers the stages, policies, feedback loops, roles and responsibilities that are built for the Upstream Kanban. Utilizing the Upstream Kanban with the elements described in the final proposal, enhancements to the current upstream process are obtained and improvements to the business agile in the case organization is guaranteed.

6.4 Action Plan

The final proposal is created to enhance the current upstream process with aim to improve business agility in the case organization. Action plan presented in this sub-section describes the steps towards the implementation. For utilizing the recommendations highlighted in sub-section 6.3, an action plan was built to develop step-by-step schedule how the proposed process and its elements can be taken in the use. The Table 17 below shows detailed action plan.

Table 17. The action plan.

	1) Create Upstream Kanban	2) Define capacity limits	3) Create explicit policies to set up the process	4) Create feedback loops to improve collaboration and knowledge sharing	5) Prepare and launch the process	6) Improve continously
Action	• Create Upstream Kanban to Jira • Add workflow steps to Kanban • Add filters and define labels to support identification of the requests based on the urgency and category	• Add WIP limits for needed stages of the workflows	• Define statements for WIP Limits, each stage of the workflow, general policies, roles and responsibilities to common place	• Set up the feedback loops and finalize their cycle • Store descriptions of the feedback loops, their purpose and participants to common place	• Move existing development requests and feedbacks to the Upstream Kanban • Conduct a walkthrough of the new process for the case organization representers and needed stakeholders • Arrange needed trainings for employees involved in the process	• Monitor the process • Make needed changes for the workflows, WIP Limits, policies and feedback loops based on the feedback
Time	June-July 2023	June-July 2023	July-August 2023	August-September 2023	September 2023	Continuous
Who	Development Manager	Development Manager	Development Manager together with Specialists	Development Manager together with Specialists	Development Manager	All

As seen in Table 17, action plan consists of six steps which are defining the action, time of execution and responsible person. The first step focuses creating the Upstream Kanban and its workflow steps to Jira. In addition to those filters are added to help users to find the specific request, and labels are defined to support urgency estimation. On the second step WIP limits are added on each workflow stage. During the third step statements for each stage of the workflow, WIP Limits, general policies as well as roles and responsibilities are defined and stored in the common place, where everyone in the case organization have the access. The fourth step sets up the feedback loops and stores their descriptions, purposes, and participants in the common place.

The fifth step is about releasing to the new upstream process in the case organization. First, all existing feedbacks and ideas are moved to the new Jira Kanban. Then needed walkthroughs, instructions, and trainings are provided to the representatives of the case organization and participants of the upstream process. As a part of the current state analysis employees especially working in the specialist positions were hoping to have general training regarding the SAFe Framework. These trainings are executed as part of the step five.

Every process needs continuous improvement, as mentioned in the sixth step this continues through feedbacks, evaluation, and monitoring. With enhancements to the upstream process the better quality and velocity of the development ideas from idea to ready to pull stage is aimed and monitoring is needed to ensure that wanted results is achieved. Otherwise, some further adjustments are needed.

In the next and the final section, the study ends with conclusion

7 Conclusion

This section summarizes the key findings and the results of this study. Section 7 contains first, the executive summary that describes the steps and the results of the study. Then, outcome of the Thesis as well as lessons learnt are analyzed and evaluated.

7.1 Executive Summary

The goal of this Thesis was to propose a solution that creates a consistent and visualized stream of ideas and defines stages for their refinement in agile development practiced by the case organization. The case organization has taken into use the new BSS and constant stream of the development ideas and feedbacks regarding system is coming in and it is difficult to maintain balance and manage the work on the top of the large funnel of options. To overcome this challenge, this Thesis focuses improving business agility by enhancing the current upstream process. With enhanced upstream process the case organization can better manage the stream of incoming requests before committing implementation of the work items in agile downstream. With the excellent upstream process, the case organization can build continuous flow to development pipeline and reach a new level of business agility.

This Thesis was conducted by utilizing the applied action research with qualitative and quantitative methods. Overall satisfaction and functionality of the current upstream process was analyzed through multiple data collection methods such as quantitative questionnaire, interviews, observation, document analysis and benchmarking. The research process was executed via pre-established stages, analyzing first the current stage of the upstream process, followed by the literature review, and building the initial proposal.

The findings from the current state analysis identified weaknesses regarding tools, methods, policies, and communication. Furthermore, strengths, threats and opportunities were recognized as part of the CSA. Based on the identified weakness, the focus areas for the literature research were selected.

The available literature and best practices discussed streamline and agile way of working methods which are prerequisites for building an efficient and continuous end-to-end

workflow from idea creation to delivery. To achieve the better business outcomes Steyer (2017), Senapathi & Drury-Grogen (2021), Andersson and Carmichael (2016) and Damij & Damij (2021) gave excellent suggestions what are the key elements for improving the upstream process. The findings from best practices and the current state analysis appointed the four key elements for building the initial proposal regarding improvements that enhances the upstream process: Visualization and Transparency, Limiting Work-in-Progress, Creating Explicit Policies and Improving Collaboration in different stage of the upstream process.

Data collection 2 was executed as part of the building initial proposal. Data 2 focused identifying the best way of working methods for the upstream by benchmarking other departments and brainstorming solutions in interviews with the case organization representatives. As a part of the co-creating the initial proposal with the stakeholders' different solutions were recognized that could support a continuous workflow. Inputs from the current state analysis, best practices from literature and Data 2 findings were tailored together for building the initial proposal which is consisting of the four key elements: *Creating Explicit Policies* for Upstream process, establishing *Work-in-Progress Limits* for development items and enhancing *Collaboration in different stages of Upstream process* by utilizing feedback loops. *Visualization and Transparency* element propose to utilize Upstream Kanban that visualizes development requests and feedbacks, displays the process flow and steps of the development.

Validation and analysis of the initial proposal was executed in workshops with the stakeholders. The experts in different positions representing the case organization and Product Management of the Corporate Business highlighted the benefits for each of the element and provided recommendations for enhancements. These inputs were collected as Data 3. Based on the discussions and suggestions from the stakeholders, the final proposal for improvements to enhance the upstream process was created.

The proposal for improving the upstream process provides the mechanism to the case organization that can overcome the current paint points, improve business agility by making work visible and explicit, and to ensure a constant end-to-end flow of development options. As results work items regarding the new BSS is implemented with better quality and improved velocity.

7.2 Thesis Evaluation

The objective of this Thesis was to propose the solution that creates a consistent and visualized stream of ideas and defines stages for their refinement. The expected outcome of the study was to create detailed proposal for the improvements to the current upstream process. With improvements recommended in the proposal, the case organization can enhance upstream process and achieve a new level of business agility.

The purpose of creating this proposal was to provide a fundamental framework that overcomes the current pain points and defines exact process that the case organization can use to improve way and quality of working in the upstream. The proposal helps to solve the current practical problem in the case organization, which is crucial and highly beneficial.

The research progress execution followed the pre-established stages and data collection rounds, making progress of this applied action research logical and clear. The stages are Current State Analysis, Existing Knowledge, Building Initial Proposal and Validation of Initial Proposal. The Current state analysis focused identifying weaknesses, strengths, stages, and principles of the upstream process (collected from analyzing Data1). Multiple data collection methods such as questionnaire, interviews, observation, and document analysis were utilized in the CSA. Using variety of data collection methods in Data 1 gave different perspectives for the pain points and insights regarding business challenge. Also interviewing employees in the different positions gave an excellent overall view of the problems in the current process. These enabled that in the proposal building needs regarding employees working in the different roles in the upstream could be considered.

The literature review and best practices helped to understand tools and methods from the agile organization that support companies to enhance the current upstream processes. Literature review provided excellent recommendations how to adapt more agile way of working and support business or team in agile transformation. Most of the literature regarding Kanban method or enhancing agile way of working processes focused on delivery workflow. Enhancing the upstream workflow and the upstream process are still mostly unknown in agile development and there was limited amount of information available. Because of these, the best practices for enhancing delivery workflow were adapted to upstream process and utilized in the initial proposal.

The initial proposal was created first based on the findings from the CSA, best practices from literature and inputs from Data 2, which included individual interviews with the stakeholders. Instead of collecting inputs individually, it would been more beneficial to organize common workshop and co-create the initial proposal with the wider number of participants. More likely this would brough more views and suggestions to proposal. Utilizing benchmarking in building initial proposal was a good decision because these brough insights from other business unit's way of working models.

The final proposal for the improvements that enhance the upstream process was the outcome of validating the initial proposal with the stakeholders. The initial proposal was validated in two separate workshops. Based on development recommendation provided by the stakeholders, changes on additions were made and the final proposal was then formed. All the key stakeholders were not able to participate in the workshops, which reduced slightly the inputs for the initial proposal. More advanced booking for workshops might be increased amount of the participants. However, employees working in the different roles in the current upstream process was represented and valuable inputs from all parties was received

7.3 Closing Words

This Thesis emphasizes the importance of a systematic and visual approach in the upstream process development, that is beneficial for the case organization as it brings together the essential elements in the way of working. The proposal for improvements in the upstream process, for the solution that creates a consistent and visualized stream of the ideas and defines stages for their refinement was built based on the extensive analysis of the current state, literature, and process benchmarking.

The Upstream Kanban and its workflow stages are core of the improvements that were proposed for the current upstream process in the case organization. Exploring ideas through stages of the Kanban team can better understand the end users' needs and by analyzing them from different perspectives provide value-adding requests. Policies and meetings built around the Kanban are supporting the continuous flow of the work items. With enhanced the upstream process and by utilizing the Upstream Kanban the whole value stream from the idea to the production release is ensuring that delivered work items are meeting end users' expectations in terms of quality and usability.

The key elements for the improved upstream process are adaptable in the different situations and needs. Many teams or business units can benefit about these principles even though they are not developing the systems but for example processes. As a part of the interviews and the workshops executed in this study interests regarding the upstream process idea were raised multiple times and I hope that in future principles of the proposal will be utilized across organization.

I believe that implementation of the proposed actions will enhance the knowledge of Upstream Kanban and importance of the upstream process and they will be beneficial elements for number of the teams and organizations in the future.

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Appendix 1: The Case Organization's User Satisfaction Survey regarding the BSS *(Data collection 1)*

USER SATISFACTION SURVEY

1. How likely you would recommen the BSS for other users from scale 0-10?

	0	1	2	3	4	5	6	7	8	9	10	
Not at all likely	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Extremely likely

2. Argument for the NPS score

3. Rate, how effortless you feel using the system at the moment

- ◯ Strongly Disagree
- ◯ Disagree
- ◯ Somewhat disagreesamaa
- ◯ Undecided
- ◯ Somewhat agree
- ◯ Agree
- ◯ Strongly agree

4. Evaluate the statements to the system's related development

	Strongly disagree	Disagree	Somewhat disagree	Undecided	Somewhat agree	Agree	Strongly agree
My ideas have been taken in the account in the system development	◯	◯	◯	◯	◯	◯	◯
I get enough information for the BSS' development schedule	◯	◯	◯	◯	◯	◯	◯
I know to which channel I can give feedback and development ideas regarding the BSS	◯	◯	◯	◯	◯	◯	◯

Appendix 2: The Case Organizations Interview Structure for the Current State Analysis *(Data collection 1)*

INTERVIEW CHECKLIST

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1. MASTER THESIS INTRODUCTION AND BACKROUND

- ☐ Short introduction of the Master thesis
- ☐ Reasons behind selecting the topic

2. COLLECTING THE DEVELOPMENT IDEAS AND FEEDBACKS

- ☐ Awareness of the channels where development ideas or feedbacks are given
- ☐ Evaluation about channels and their functionality
- ☐ Awareness regarding how and where the ideas and the feedbacks are maintained
- ☐ Evaluation about the current idea management system (Weakness and Strengths)

3. HANDLING OF IDEAS AND FEEDBACKS

- ☐ Awareness of how the ideas are analysed and how Go or NoGo decisions are made
- ☐ Recommendations for participants in the analysis and decision making
- ☐ The current state and recommendations regarding elaborating and concepting the development items and feedbacks
- ☐ The current state regarding prioritization and recommendations for it

4. FOLLOW UP AND DEVELOPMENT IN THE DOWSTREAM

- ☐ Capability to check whether some development idea exist
- ☐ Capability to check status of some of the existing development items
- ☐ Possibility to follow process of the development items
- ☐ Knowledge of how the development items is proceeding in Agile Release Trains

5. KNOWLEDGE OF SAFE

- ☐ Awareness regarding SAFe principles
- ☐ Need for the trainings regarding SAFe and agile way of working

Appendix 3: The Case Organizations Interview Structure for the Building Proposal *(Data collection 2)*

INTERVIEW CHECKLIST

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1. MASTER THESIS INTRODUCTION AND BACKROUND

- ☐ Short introduction of the Master thesis
- ☐ Reasons behind selecting the topic

2. COLLECTING THE DEVELOPMENT IDEAS AND FEEDBACKS

- ☐ Collecting methods for the feedbacks and ideas (internal & external)
- ☐ Maintenance solutions for the feedbacks and ideas
- ☐ Decision making (NoGo or Go), Analysis, Participants

3. HANDLING OF THE IDEAS AND THE FEEDBACKS

- ☐ How ideas are analysed or elaborated, who are involved
- ☐ Prioritization to ARTs
- ☐ Current Strengths and Weakness of the current process
- ☐ Weaknesses and Strengths of the current process

4. EVALUATION

- ☐ Best Practice in the current way of working
- ☐ Evaluatuion of the proposal, Input & Refinement suggestions