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Streamlining Delivery Processes for Elisa Ring Services

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All significant achievements have a bold beginning and a fulfilling end. At the end of my thesis, I want to express my gratitude to all the people who have supported me. I would like to thank those who have contributed to the implementation of this thesis.

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I would also like to express my deepest gratitude, especially to my family, for their support, encouragement, and understanding. Without your love, I would hardly be here, let alone achieve these aspirations.

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Abstract

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This study aimed to develop an efficient delivery process for Ring services, with a particular focus on eliminating waste generated on the Ring delivery queue and thus significantly shorten delivery times. Cloud-based telecommunications is undergoing a major transformation, and Ring delivery services play a role in this context as well. Their efficient delivery process is strategically important for the company's competitiveness and customer satisfaction.

The study was carried out using a five-stage applied action research methodology, which started with setting the objective and included an analysis of the current state (CSA), the development of a conceptual framework, and the preparation and validation of a proposal. In the analysis of the current situation, the delivery process of the Ring delivery services was examined together with stakeholders, and challenges and necessary improvements were identified. With the help of CSA, the development areas were identified to optimize delivery tasks and to clarify transparent background information on orders. The demand to improve the flexibility and reliability of the automation system was also identified. The conceptual framework was developed based on the literature review that was later utilized in the development work. Suggestions derived from literature provided a basis for developing the solutions and addressing the problems identified.

In the development phase, the proposals were co-created with the help of stakeholders, and the focus was on practical solutions tailored to the case company’s specific needs. Before the proposal was developed, the Conceptual framework was creatively reflected upon and adjusted in cooperation with stakeholders, to fit to the perspective provided by the case company. The proposal included developing an efficient delivery process that should significantly reduce unnecessary work and improve the availability and quality of the case company’s Ring services. In the validation phase, the proposal was discussed with the relevant stakeholders, and the feedback received was incorporated into the final proposal.

This thesis contributes to developing an efficient delivery process for the Ring services and thus strengthening the case company’s competitiveness and improving customer satisfaction. Such improvements are essential for the company's performance and competitiveness, which an efficient delivery process can significantly increase.

Keywords: Delivery process, Telecom services, delivery time, waste, quality, availability, customer satisfaction

Contents

Glossary

UCaaS	Unified Communications as a Service, is a cloud-based model that integrates various communication and collaboration tools into a single platform, offering organizations flexible and scalable solutions over the internet.
CSA	Current State Analysis is a management method for identifying and evaluating a company's processes and workflows.
R&R	Roles & Responsibility, defines the work domain, key functions, performance areas of the individual.
KPI	Key Performance Indicator, a quantifiable measure of performance over time for a specific objective.
CX	Customer Experience, the overall belief of a customer’s interaction with a company or its products/services.
SOSE	Service Oriented Software Engineering, a software engineering approach that emphasizes service-based architecture.
CCM	Customer Communications Management, team that communicates with customers on order, billing and implement issues.
RPA	Robotic Process Automation uses software robots and AI to automate repetitive tasks, freeing up human time for more complex work.
K-PIMRBP	Knowledge-Based Process of the Integrated Management of Risks and Business Processes, seven steps of framework for risk management.
IKMP	Integrated Knowledge Management Process is a system designed to manage multiple aspects of an organization's operations in line with multiple standards.
BPRIM	Business Process-Risk Integrated Method is a three-step meta-model framework for risks and business processes.
TQM	Total Quality Management is an approach focused on improving the quality of all organizational processes.
BPR	Business Process Re-engineering is a strategy that involves the radical redesign of business processes to achieve significant improvements in critical measures such as cost, quality, service, and speed.
VUCA	An acronym that stands for Volatility, Uncertainty, Complexity, and Ambiguity. It describes the challenging conditions in the modern business environment and is often used in strategic planning to address unpredictable and rapidly changing scenarios.

EFQM	European Foundation for Quality Management is a framework for organizational management systems, promoting sustainable excellence.
DMAIC	Define, Measure, Analyse, Improve, Control. A data-driven improvement cycle used for optimizing and stabilizing business processes and designs.
FMEA	Failure Modes and Effects Analysis. A systematic method for evaluating processes to identify where and how they might fail and assessing the relative impact of different failures.
STPA	System-Theoretic Process Analysis (STPA), safety analysis method designed to identify potential hazards and unsafe control actions in complex systems
SST	Social Shaping of Technology is an approach that examines how social, economic, and political factors influence the development and implementation of technology.

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1 Introduction

In today's digital era, telecommunications companies face an increasingly competitive environment, where the efficiency and effectiveness of service delivery processes are important. As increasing demands for speed and reliability increase, organizations must continuously optimize their operations to meet changing customer expectations on an ongoing basis. Elisa Oyj, a major player in the telecommunications industry, is an example of its commitment to excellence, long-term quality work and continuous improvement.

As Peter Drucker wisely said, "Efficiency is doing things right; effectiveness is doing the right things." Elisa Oyj has received recognition for its commitment to long-term quality work. This commitment is not just about doing things right; it extends to a culture of continuous improvement, learning and collaboration. Elisa's determined investment in quality is seamlessly connected to the two goals of our research: improving the delivery process of Elisa Ring services and aligning operations with Elisa Oyj's strategic goals.

This study zooms into the delivery side of Elisa Ring's development, aiming to streamline processes, minimize unnecessary work, and generate innovative ideas to accelerate service delivery. The overarching goal is not only to meet the escalating demands of the growing user base but to comprehensively enhance Elisa Ring's service offering. Thus, the primary business problem centers on the imperative to fortify the organization's foundation and refine operational processes. The heightened workload associated with solution planning tasks underscores the critical need to speed up delivery schedules.

1.1 Business Context

The case company in this thesis is Elisa Oyj. Elisa Ring, a Unified Communications as a Service (UCaaS) solution hosted in the cloud, experiences significant growth in its customer base and undergoes technological developments to meet evolving user needs. This growth mirrors Elisa Oyj's commitment to continuously improve the platform's features. However, challenges arise due to the rapid pace of feature implementation and the integration of new functions and services, particularly within operational processes and technologies.

In the competitive environment of the telecommunications industry, Elisa Oyj is a leading force, especially in Finland and the Baltic markets. Known for its commitment to

innovation and customer-oriented services, the case company has become one of the largest telecom operators in the region. As the industry develops, the case company needs to adapt and enhance its operating processes in order to support a competitive advantage.

1.2 Business Challenge, Objective and Outcome

The case company faces a critical *business challenge* that focuses on improving its delivery process, focusing especially on Elisa Ring services. The goal is to make operations more efficient, minimize unnecessary work and promote innovations to speed up the delivery of services. This challenge arises from the realization that a more efficient delivery process not only strengthens an organization's competitive advantage but also plays a key role in attracting a larger customer base. As the demand for Elisa Ring services increases, the need to adapt and innovate in the delivery framework becomes paramount, which emphasizes the strategic importance of this initiative in the wider telecommunications world.

The most important challenge for the company's business is the *strategic streamlining of the delivery process, minimizing unnecessary work and encouraging innovative ideas from a delivery perspective*. This initiative specifically targets the accelerated delivery of Elisa Ring services. The challenge is to organize these changes not only to make operations more efficient, but also to strengthen the company's competitive advantage and attract a wider customer base.

The Objective of this thesis is *to develop an efficient delivery process for Elisa Ring services, with a clear emphasis on shortening delivery times by reducing waste work.* The goal is in line with the company's strategic vision. The goal is a delivery framework that not only meets the changing demands of the market, but also positions the company as a responsive and efficient player in the telecommunications industry. The central thesis question guiding this study is: "How can the delivery process of Elisa Ring services be optimized to minimize inefficiency and expedite delivery times?"

The outcome is *a proposal for an efficient delivery process for Elisa Ring services, from which unnecessary work steps have been removed.*

1.3 Thesis Outline

The scope of this thesis focuses on Elisa Ring service at Elisa Oyj, and deals specifically with streamlining the delivery process of Elisa Ring services for making the delivery process more efficient and reducing delivery times. The geographical location is Finland.

The method used in this thesis includes a practice-based development approach. First, the current state of analysis (CSA) is conducted. In this phase, the existing delivery process of Elisa Ring services is evaluated. It includes a comprehensive analysis of current practices, user interfaces, roles and responsibilities (R&R), key performance indicators (KPIs) and other related aspects. The goal is to identify bottlenecks, challenges and delays in the delivery of services. Second, a conceptual framework is built based on academic and business literature, as well as published best practices, to guide the process improvements. Third, as part of the Proposal building, this conceptual framework is then adapted based on the findings of the CSA and internal knowledge, the company's experience. All these inputs serve as a basis for proposal building to address the issues identified in the delivery process and develop the solution. These initial solutions are later validated to ensure the fit with the company's specific needs.

This thesis unfolds in seven sections. The first section is Introduction. This section provides an overview of the telecommunications industry, introduces the role of the case company and outlines the business challenge in improving the delivery process of Elisa Ring services. The second section is Method and Material. This section describes the research approach, research design and methods used in this study, which lay the foundations for subsequent analysis and proposition development. The third section is the current state analysis of Elisa Ring Services´ delivery. This section takes a look at the current state of the services, including detailed descriptions and analyses. A summary of the findings is made, highlighting strengths, weaknesses and selected focus areas for development. The fourth section is the overview of available knowledge and best practices. In this section, the thesis examines existing knowledge and best practices related to the thesis objective. The conceptual framework is drawn up based on elements derived from literature and industry insights. The fifth section is focused on developing a proposal for an effective delivery process. This section provides an overview of the proposal development stage, including insights into the current state analysis, conceptual framework, and co-creation data. The initial proposal to streamline the delivery process is presented at the end of the section. The sixth section is a report on the validation of the initial proposal. The validation phase results in further improvements

to the initial proposal based on the collection of additional data. Changes are presented to the initial proposal that led to the final proposal. Additionally, the recommendations for implementation are given. The last section is the conclusion. The thesis ends with a summary, management implications, evaluation of the thesis and concluding remarks.

1.4 Key Concepts

Efficient delivery process: The efficient delivery process refers to a systematic and optimized series of activities involved in providing Elisa Ring services. This process aims to minimize delays, reduce unnecessary steps and enhance overall effectiveness. Efficiency is achieved through the strategic organization of resources, streamlined workflows and the elimination of bottlenecks (Villa, 2023).

Delivery times: Delivery times represent the duration required to complete the end-to-end delivery of Elisa Ring services. This metric is crucial for assessing the efficiency and responsiveness of the delivery process.

Streamlining a process: Streamlining operations involves the strategic optimization and simplification of operational workflows within the delivery process. The goal is to eliminate inefficiencies, reduce complexities, and enhance the overall flow of activities. Streamlining contributes to quicker, more effective service delivery and reduced costs (Muscad, 2023).

Conceptual framework: The conceptual framework serves as a reference model developed and based on internal knowledge, literature reviews, meetings and stakeholders' views. Framework guides the proposal of targeted solutions to address identified issues within the process. It provides a structured and theoretical basis for understanding and improving the workflow or problem involved.

Bottlenecks: Bottlenecks are points within the delivery process where the flow of activities is impeded, causing delays and potential disruptions. Identifying and addressing bottlenecks is essential for maintaining a smooth and efficient process.

Roles and responsibilities: Roles and Responsibilities (R&R) define the specific duties, tasks, and responsibilities assigned to individuals or groups during the process. Clear R&R ensures that each team member understands their role, which promotes collaboration and accountability.

Key performance indicators: KPIs are quantifiable metrics used to measure the performance and effectiveness of the process itself. These metrics provide objective insight into different starting points of the process, assist evaluate its success and identify areas where there are positive or negative correlations between KPIs (Kang et al. 2016: 2).

2 Method and Material

This section outlines the thesis research approach, research design, and data collection and analysis methods, providing readers with an understanding of the systematic method used to achieve the thesis objective.

2.1 Research Approach

Research types can be split into different research families and methods. Research families play a key role in any research. *Basic* research focuses on expanding theoretical knowledge and understanding principles. It is often driven by curiosity and seeks to uncover new insights without an immediate focus on practical application. *Applied* research, on the other hand, is intentional and aims to solve certain practical problems. It addresses real challenges and seeks workable solutions directly to the research context (Baimyrzaeva, 2018: 6). Additionally, *field* studies are directly related to the real world of research. Researchers collect information on site by observing, interviewing or experimenting, gaining a first-hand understanding of the topic being studied. *Desk* studies, on the other hand, are based on existing literature, documents and secondary data. While useful for synthesizing existing knowledge and theories, desktop research may lack the depth and context of field research (Owa, 2023).

Qualitative research dives into the depths of human experiences, often using methods such as interviews, observations, and content analysis. It emphasizes the study of meanings, attitudes and behaviors. As shown in Figure 1, research can be viewed from a qualitative, quantitative and mixed perspective.

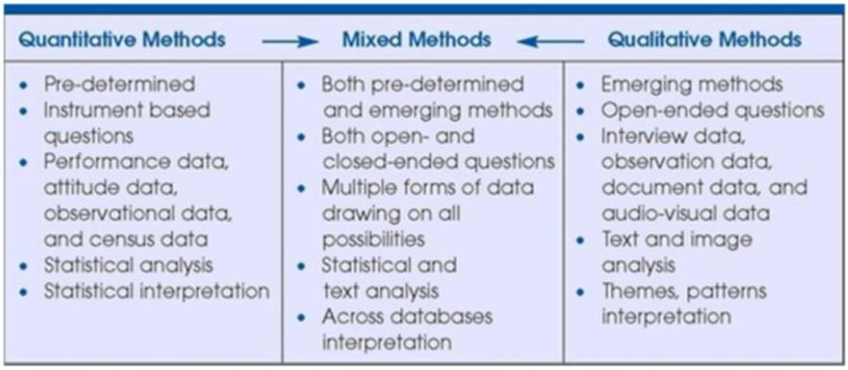

Figure 1. Distinctions among quantitative, mixed and qualitative methods (Creswell, 2008: 32).

In Qualitative research, literature is often used sparingly at the beginning to preserve the inductive nature of the study. However, some research designs may require a more substantial literature review upfront. It's essential to consider the most appropriate placement of the literature, which depends on the intended audience. Options include placing it at the beginning to frame the problem, in a separate section, or at the end to compare with the findings. The advantage of qualitative research lies in its flexibility and the in-depth understanding it provides, focusing on complex phenomena beyond quantitative measures (Creswell, 2008: 43).

Quantitative research involves the collection and analysis of measurable data, enabling statistical reasoning and generalizations. Surveys, experiments and statistical analyses are common tools for quantitative research. Blended research combines both qualitative and quantitative approaches, providing a comprehensive understanding of the research problem. This makes it possible to study complex phenomena more diversely and strongly.

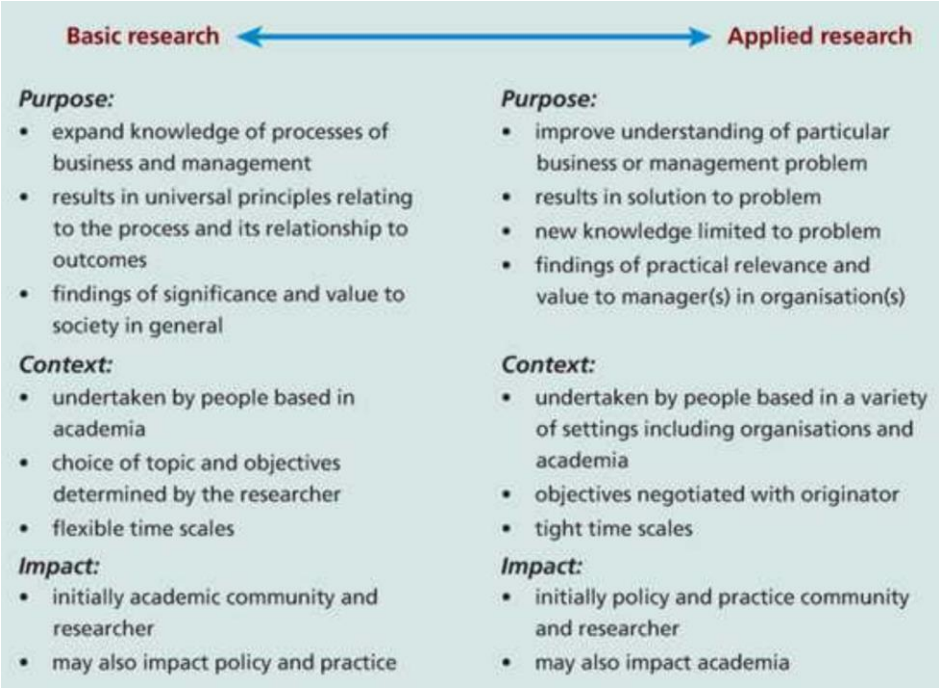

Figure 2. Basic and Applied research (Saunders, Lewis and Thornhill, 2019: 46).

All business and management research projects can be placed on a continuum as seen on Figure 2. At the other end of the continuum is basic research, which is carried out purely to understand business and management processes and their results. At the other end is Applied research and this is directly relevant and practical for professionals. It

addresses topics that are important to them clearly so that they can understand and apply them in practice (Saunders et al. 2019: 45).

As this thesis focuses on streamlining Elisa Ring deliveries, it belongs to the realm of applied research and requires practical and experience-based solutions, which supports the choice of an applied research approach. This study is also a field study since data collection is done via practical observations and interviews, experiencing the field conditions, such as real-time monitoring and processing style of tickets. The choice of applied research is supported by the goal of making deliveries and ticket processing more efficient. Applied action research is suitable for this thesis as it offers a flexible, situation-tailored approach that is closely aligned with the development work aimed at the organization's culture of continuous improvement. This research strategy allows practical solutions to be implemented quickly and ensures that changes meet the real needs of stakeholders.

As for the research methods, this study uses qualitative research methods, such as interviews, surveys, observations and document analysis, with the aim is to collect diverse and reliable insights on the current state of the Elisa Ring deliveries and make realistic suggestions for improvement.

2.2 Research Design

The study design proceeds in three consecutive steps: a notification, an introduction to the chart, and a walkthrough of its key elements.

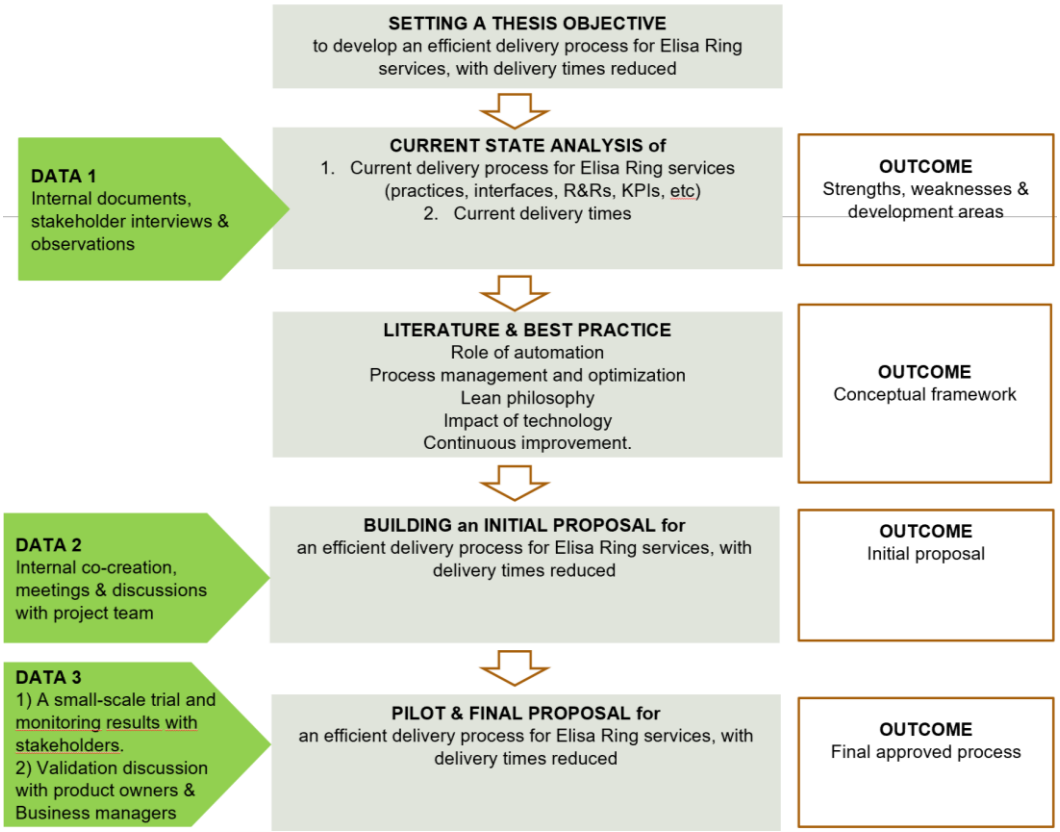

Figure 3. Research design of this study.

As shown in Figure 3, the research begins by setting up the objective and conducting the current state analysis of Elisa Ring's deliveries and processes. Stakeholder perspectives are carefully considered through internal documents, interviews and observations. The analysis reveals the current challenges of delivery processes.

Next, the existing knowledge and best practices are explored. Based on this, the thesis gathers the guidance how to streamline workflows and eliminate inefficiency. Then a preliminary proposal is developed, which includes different solutions. The thesis progresses to the practical stage with a small-scale pilot, which is then closely checked in cooperation with stakeholders. After the small scale pilot, the discussion on results and the validation session refine the proposed changes. This iterative process leads to the implementation of a pilot project that serves as a small scale testing ground for the final proposal. The end result is an approved process that reflects a thorough exploration from the initial inquiry to an effective Elisa Ring service delivery process.

2.3 Data Collection and Analysis

First, to ensure confidentiality and respect the privacy of stakeholders, permission was obtained personally from each participant to refer to statements, quotes or points of view. Due to the limited number of stakeholders involved, anonymity was maintained by using unidentified identifiers (respondent x) when referring to individual comments. In this context, x does not refer to a person in numerical terms, but instead, the number is in sequential order to ensure privacy. This approach safeguards the privacy of participants while allowing their views to be expressed.

Throughout the process, ongoing discussions with stakeholders were held almost daily, with only the most essential and significant meetings listed here, outside of planned activities. Insights from these discussions have also been highlighted. This consistent interaction ensured alignment between the study and their findings, needs, and expectations, while also providing continuous opportunities for refinement.

This thesis draws on many different sources of information to comprehensively explore the topic. The data collection process covers several rounds, each of which focuses on different aspects of the study. Table 1 shows details of Data collections 1-3 used in this research.

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

	Participants / role	**Data type**	**Topic, description**	**Date, length**	**Documented as**
	Data 1, for the Current state analysis				
1	Participant observations	Observations	Known issues / problems	2021-2023	Observations, notes, diary, e-mails
2	Product owners, business managers, product manager, team lead	Teams meeting	The current state of issues, known ticket problems	October 25th, 2023, 60 min	Field notes, document and research proposal
3	Ring Delivery Team with Team Lead	Teams Meeting	Discussion about current views based on the team experiences.	November 27th, 2023, 60 min	Field notes, recording and document
4	Product owners, business managers, product manager, team lead	Teams Meeting	Discussion about current views about identified issues	November 30th, 2023, 60min	Field notes, recording and document

5	Stakeholders meeting	Teams Meeting	Identifies weaknesses and potential development areas	December 7th, 2023, 60 min	Field notes, recording and document
6	Stakeholders meeting	Teams meeting	Current situation and views about issues	January 17th, 2024, 60 min	Field notes and document
7	Stakeholder, RPA specialist	Teams meeting	RPA possibility on identified issues	January 23rd, 2024, 60 min	Field notes
	Data 2, Proposal building (Section 5)				
8	Project team	Meeting & co-creation	Proposal building	March 28th, 2024, 60min	Meeting notes, documents & a proposal draft
	Data 3, Validation (Section 6)				
9	Product owners, business managers, product manager, team lead	Feedback from the pilot (data / tickets) Validation session	Pilot results, validation session & further improvements	April 4th, 2024, 60min	Feedback from the pilot (data / tickets) Meeting Notes

As shown in Table 1, the data for this thesis was collected in three separate rounds, each serving a specific purpose. In the first round, Data 1, the focus was on analyzing the current state. Participant observations, team meetings and stakeholder interactions were used to gain insights into known problems and issues within Ring delivery. This round of data collection spanned from 2021 to the end of 2023 and included a variety of methods including observations, note-taking, journal entries, and email correspondence.

Moving to the second round, Data 2 was collected to develop the proposals for the case company/unit. This phase included meetings and co-creation events with the project team, where proposals were drawn up. Relevant data for this round includes meeting notes, documents and draft proposals.

The third phase which is validation aimed to collect and refine proposals based on the meetings and observations of the second phase. At this stage, feedback on validation and piloting was received especially from the case company and stakeholders.

The collected data was analyzed to assess the current state, streamline the Ring delivery process, and evaluate the proposed process improvements. The results of Data 1 analysis, which highlights the strengths and weaknesses of the current process, are addressed in Section 3 below, which focuses on the analysis of Elisa Ring Delivery.

3 Current State Analysis of Elisa Ring's Delivery Processes

Analysis of the current state is a necessary step to describe the complexity of the Elisa Ring delivery processes and identify its strengths and weaknesses. This section starts by describing and then analyzing the existing workflow and processes of the Elisa Ring operating environment. The focus of the analysis is to identify strengths and weaknesses and to highlight areas that require development. As a result, the possibilities for improvement in the current situation are identified.

3.1 Overview of the Current State Analysis

The primary goal of the Current State Analysis (CSA) was to gain a thorough understanding of case company Ring's existing delivery processes. The analysis went ahead with a systematic approach involving five key steps.

In the first phase, the scope and goals were defined in order to give a clear direction to the analysis. The focus was on defining the boundaries of the examination and setting concrete goals that fit the scope and serve the purpose best. Already at this stage, some of the development targets were discussed to some extent via field experience with stakeholders. Observations were made about the existing delivery process, roles and responsibilities.

In the second step, contact interviews and meetings were conducted with key stakeholders, i.e. internal teams. The goal of this phase was to gather different perspectives and insights from those who are directly involved in the delivery processes or who are affected by the delivery processes. Meetings are documented, the proposed delivery model is reviewed, and insights are obtained.

In the third step, data collected through different channels, such as field experience, observations and team meetings were systematically processed. Processes, roles, responsibilities and relevant details were carefully documented to provide a comprehensive basis for analysis.

Once relevant insights were gathered and mapped, the focus shifted to analysis. This included thoroughly examining Elisa Ring's delivery system to identify its inherent *weaknesses and strengths*. In addition, several repeated comparative analyses with historical data were performed to obtain an overall picture of possible cost benefits.

3.2 Description of Ring Delivery

This section describes the Ring delivery and processes. The goal of the description is to comprehensively understand the current workflow. An overview of the Ring delivery team is first presented, including insights into its tasks, key stakeholders, main tools, and communication channels.

3.2.1 Roles & Responsibilities of Ring Delivery Process

The roles and responsibilities are outlined in Table 2 below, providing a clear and systematic view of each stakeholder's contributions within the Ring delivery processes. This table offers a comprehensive and systematic overview, detailing the specific contributions and areas of responsibility for each individual or group

Table 2. Roles and responsibilities of Ring delivery Process.

Role	Responsibilities
Project managers	- Focus on the Ring deliveries by coordinating large-scale projects, including resource allocation, delivery scheduling, and reporting. - Maintaining customer contacts and meeting case company delivery requirements. - Delegate issues that arise during the customer's delivery process to the necessary parties.
Solution design team	- Collaborates with project managers and clients to understand customer needs and develop customized solutions. - Ensures that the delivery standards of each solution are met. - Manage the numbering plan and act as a stakeholder in relation to the customer during the delivery of the solution.
Service-Oriented Software Engineering (SOSE) Team	- Address complex software issues to ensure system stability. - Troubleshoot challenging faults that sometimes require escalation to device manufacturers. - Makes software fixes, works with the hardware manufacturer and optimizes software performance and functionality

Customer care management	- Serves by responding to customer and sales order inquiries and managing service requests. - Managing orders related to the case company's Ring products and services. - Manages the OmaElisa portal, which initiates work management system orders, including Ring deliveries. - Participates in deliveries and related projects.
Order processing group	- Manages order receipt, processing, and billing checks. - Enabling efficient order processing to maintain high customer satisfaction throughout the Ring delivery process.
Ring delivery team	- Implements in the delivery process and serves as a resource for customer-oriented delivery projects. - Performs daily work related to delivery. actions essential for efficient delivery and ensure smooth operation throughout the customer delivery.

Table 2 shows the roles and responsibilities involved in the Ring delivery process. It contains the following list of key stakeholders:

Project managers play a key role in overseeing Ring deliveries. Project managers coordinate large-scale projects, including resource allocation, delivery scheduling, and reporting. In addition, they are responsible for customer contacts, meeting case company's Ring delivery requirements and resolving any problems that may arise during the customer delivery process.

The solution design team plays an important role in designing solutions. They collaborate with project managers and clients to understand the customer's wishes, develop desired solutions and ensure that the delivery to the customer meets the necessary standards. In addition, the solution design team is responsible for managing the numbering plan and acting as a delivery stakeholder in the delivery phase of the solution.

The service-oriented software engineering (SOSE) team plays a significant role in the Ring delivery process as a stakeholder. SOSE handles solving complex software problems and ensuring the system's smooth operation. SOSE's primary goal is to investigate challenging defects, such as those that require escalation to the device

manufacturer. In addition, SOSE is actively involved in submitting bug fixes, suggesting improvements, and performing various software-related tasks to optimize system performance and functionality.

Customer care management (CCM) forms a vital stakeholder in the delivery process, and it works on the front line in responding to customers and sales order inquiries and service requests. As a central part of a functioning ecosystem, CCM also interacts directly with customers to solve order problems related to Ring products and services quickly and efficiently. CCM is also involved in deployments and projects. As a rule, CCM also manages OmaElisa, which is a management portal that the customer also has access to. The management portal creates orders for the work management system and thus also for Ring deliveries.

The order processing group is also a key stakeholder group that ensures efficient order processing and customer satisfaction in Ring's overall delivery process. This group handles tasks that include receiving orders, processing them, and performing the necessary checks on billing information.

The Ring delivery team is responsible for the delivery process and acts as a resource in customer-oriented delivery projects. Its responsibility includes a set of activities necessary for the efficient execution of delivery functions.

One of their main day-to-day operations is to handle incoming repairs as well as delivery requests and ensure that all necessary actions are carried out in accordance with orders. This includes managing incoming orders, organizing delivery schedules, and coordinating with relevant stakeholders on schedule and with necessary configurations to orders.

In addition, the Ring delivery team acts as an expert in challenging delivery problems, troubleshooting and resolving customer requests. The team's goal is to react quickly and efficiently to all day-to-day problems that concern the customer, reflecting the dynamic and holistic nature of CX (Customer Experience). In this way, the team can also contribute to ensuring that the interaction experienced positively impacts the overall customer experience, improving customer satisfaction. The team also commits to personal collaboration, ensuring that solutions are tailored to customers' individual needs and preferences. This approach reinforces the feeling of appreciation of each customer as a unique customer. The team also emphasizes clear and consistent communication

throughout the process to reduce uncertainty and build trust. These are key elements in providing a positive customer experience.

In addition to operational tasks, the team is also responsible for taking part in delivery projects. A delivery project is an entity to which a resource from the delivery team is pre-defined. These needs are coordinating delivery projects, providing the necessary guidance and support to customers, and thorough follow-up to ensure the successful implementation of services. This role involves a deep engagement with the principles of CX, as each touchpoint and interaction contributes to the overall customer journey.

By continuously seeking ways to enhance delivery processes, the team also aims to continuously improve outcomes and ensure a seamless experience, in line with recent insights on customer engagement and service excellence

Overall, the Ring delivery team plays a versatile role in the delivery process, spanning responsibilities from order processing and coordination to problem resolution and customer support.

3.2.2 Technological Tools and systems in the workflow

Technical tools and systems play a crucial role in making the Ring delivery process easier and more efficient. The two primary systems that significantly affect the workflow are the order tracking systems: The work management system and OmaElisa. These systems provide essential functions to track, manage and monitor orders from initiation to delivery.

Table 3. Short description of tools.

System / Platform	Description	Key Features
Work Management System	A comprehensive task management platform for real-time order tracking and easy coordination between team members.	Real-time order tracking Team coordination Efficient problem handling during order delivery
OmaElisa	Transparent portal for customers to place orders, manage changes and track order status.	User-friendly interface Transparency in order status Enhance customer experience

OmaRing	A service with an intuitive user interface for managing the Ring service, enabling users to implement changes quickly and reliably	Intuitive user interface Service changes and parameter adjustments
Webadmin	The predecessor of OmaRing, is mainly for system administrators, which offers a wide range of management tools that are an integral part of the system's operation.	Extensive management tools Functions not yet integrated into Omaring
Ring Platform	Ring service platform, which consists of changes and orders from different portals.	Consist of various management tools Platform of the Ring

Table 3 lists the tools with descriptions and key features. The tools inlcude:

Work management system serves as a comprehensive platform for managing work activities. It enables order tracking in real time. In addition, work management system facilitates coordination between team members, which enables seamless collaboration and efficient handling of problems that may arise during the order delivery process.

OmaElisa, on the other hand, acts as a customer portal through which customers and internal stakeholders on behalf of the customer can place orders, make changes and monitor the status of orders. OmaElisa offers customers transparency and control over their orders and improves the overall CX by offering a user-friendly interface.

OmaElisa creates jobs from orders using automation to the work management system and assigns them to the right work queues. The Ring delivery related tasks are added to the Ring delivery work queue for manual processing.

The Ring platform encompasses various tools for handling and operations, with some managed by the customers themselves and a significant portion administered by case company.

OmaRing is a service provided by Elisa that enables the management of the Ring service. With OmaRing, customers can quickly and reliably make changes to their systems. Whether it is changing services, fine-tuning parameters or managing call distribution protocols, OmaRing offers users an intuitive user interface to implement changes. Case company also trains and guides customers to use Omaring efficiently.

Webadmin acts as OmaRing's predecessor and still offers a wide range of management tools that are still an integral part of the system operations. Despite the advances and the introduction of OmaRing, which is designed to provide a more comfortable user interface for end users, Webadmin still has many functions that are not available directly through OmaRing. Customers are mainly trained to use Omaring, as it is intended to replace Webadmin. The transition from Webadmin to Omaring is designed to streamline the user experience and provide a better view. Comprehensive training programs have been put in place to ensure that customers are equipped to use the new platform.

3.2.3 Communication Channels

Effective communication channels play an important and strong role in the Ring Delivery process as they facilitate coordination and exchange of information, especially in an environment with many stakeholders.

Table 4. Communication channels are listed with strengths and challenges.

Communication Channel	Strengths	Challenges
E-mail	Allows for long messages, attachments	Delayed response times, risk of information overload
Instant messaging	Real-time communication promotes quick resolutions	Lacks tracking of tickets
Phone calls	Immediate feedback, helpful in complex cases	Limited documentation, not always available for all
Internal chat platforms	Accessible, promotes engagement across teams	Can be inefficient for detailed issues, lacks structure
SOSE daily meetings	Provides record of incidents, enhances transparency	Limited by system capabilities, may delay responses
Weekly Ring meetings	Ensures alignment, structured updates	Time-consuming, not real-time

Table 4 lists available communication channels with their strengths and challenges. As indicated by the stakeholders, these are seen as strengths in the efficient analysis of Ring Delivery processes.

> *“It’s super-fast and easy to collaborate via chat platforms to solve problems.” (Respondent 1)*
>
> *“Sometimes Teams gets too much work, but on the other hand, it's quick to take care of, especially when there's a bigger fault situation on.” (Respondent 2)*
>
> *“There is quite many of problems to solve via Teams and those does not cause ticket to workflow. (Respondent 3)*

According to the stakeholders, communication is smooth and efficient in any situation, but ease also brings challenges in the form of work. Although issues are often resolved swiftly, they do not always result in the creation of tickets within the workflow. Consequently, some tasks are addressed without adhering to the established procedures. This practice can lead to inefficiencies, as these tasks are neither tracked nor documented, which may impact overall process visibility.

Challenging fault situations require many kinds of investigation, but on the other hand, in fault situations, communication channels are also seen as a quick alternative to solving fault situations. In this context and meaning, communication is effective but still does not guarantee a flawless result. Another challenge with some communication channels is that they take time and cause information overload and cause work without any tickets. Feedback from key stakeholders helped assess the effectiveness of these existing communication channels. Their insights provided valuable insight into the strengths and limitations of each channel.

Although certain challenges, such as the lack of clarity in incident management communication in fault situations, were identified, they were considered to fall outside the scope of this thesis. However, recognizing these challenges lays the foundation for future improvements in communication strategies within the Ring ecosystem. Communication challenges in complex case management processes can lead to inadequate and slow communication of status updates to internal stakeholders, which can hamper transparency and effective problem solving. The lack of clarity and

transparency becomes problematic when a specific problem case is not communicated effectively within the company and is somehow neglected, leading to the problem being transferred to the system vendor without proper attention or resolution.

3.3 Analysis of Ring Delivery Processes

This section analyzes the current state of the Ring delivery process. The analysis is divided into several categories or observations, each presenting specific features of the process based on the collected data.

3.3.1 Analysis of Historical Data to Establish Baseline Reference Data

The foundation of the study is a defined *baseline reference data*, which serves as the point of comparison for all future proposals and benchmarks. This baseline is derived from real-world data; however, its specific details remain undisclosed in the study. Instead, the focus is on analyzing and presenting the benefits and impacts of the proposed changes and benchmarks relative to the baseline. The advantage of this approach lies in its ability to evaluate and calculate the tangible effects of the proposed improvements based on the baseline. Furthermore, it enables the theoretical approach to analysis. This ensures that the research outcomes are not only measurable but also practically applicable.

Random sampling has been carried out with self-made code executed in the Python programming language, which draws a random number of weeks from the history targeted at the desired period. The selected weeks of this draw were included in the analysis. The data is not processed or modified before analysis. It is taken as such from the work management system, and the analysis is based directly on collected unprocessed data. Random analysis ensures that baseline reference data remains as unbiased as possible. Given the extensive amount of data available, a complete analysis would not provide significant additional value. Instead, comparisons are conducted on a complete dataset for a specific period, offering a reliable snapshot of the current state and serving as a basis for understanding potential changes over time.

```
import random

def generate_random_sample():
    # Generate a random number between 4 and 12
    num_number = random.randint(4, 12)

    # Create a list of all weeks
    all_weeks = list(range(1, 53))

    # Choose random weeks
    random_weeks = random.sample(all_weeks, num_number)

    # Print the results
    print(f"Random number: {num_number}")
    print(f"Randomly selected weeks: {random_weeks}")

# Call the function to generate a random sample
generate_random_sample()
```

Figure 4. Python code for sample (internal document).

The code depicted in Figure 4 illustrates a program designed to generate a random sample of weeks from a calendar year. The procedure commences with the program selecting a random number between 4 and 12, which dictates the number of weeks to be chosen. Post generation of this number, the program randomly selects that many weeks from the total 52 weeks available in a year. Subsequently, the code produces the number of selected weeks and a list of those weeks, and based on these baseline reference data is generated.

The analysis of tickets in the Ring delivery queues has been done with the code as shown in Figure 4. The numbers drawn by the code can be used to collect comprehensive data from the drawn weeks, and this serves as a basis for future measures and suggestions for improvement. The same data can also be used for theoretical benchmark-style piloting, especially in cases where it is not possible to carry out large-scale piloting.

In addition to being helpful in understanding current load patterns., the collected data will serve as a benchmark and basis for future theoretical pilots and practical comparisons that will reveal meaningful values and provide perspective for this study.

3.3.2 Collected quotes and perspectives from stakeholders

In order to gain a deeper understanding of delivery processes, insights were gathered from stakeholders involved in these activities. Their valuable perspective offers context,

underscores current workflows and challenges, and provides insight into the current state. By analyzing first-hand accounts from people involved in daily delivery processes, key themes and problems that may not emerge from quantitative analysis alone can be identified.

> *“Technology does our job.” (Respondent 4)*

In this context, technology, especially automation, is also seen as a threat, as it can reduce the need for human labor and raise concerns about job security. For many employees, automation symbolizes a change in personal role in the organization.

> *“We are not always ware of new features and implementations. We hear about them when they’re implemented” (Respondent 5)*

> *“Here is no clear collaboration in case of new features.” (Respondent 6)*

> *“New functions and versions come so quickly that even the instructions can't keep up.” (Respondent 7)*

The feedback received from stakeholders highlights significant concerns about the transparency of new features and implementations as well as the complex VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) kind of style environment. This limited transparency poses challenges for development. Without awareness of new features, stakeholders cannot fully leverage efficiency or ensure the functionality of automation, let alone improve processes. The lack of cooperation makes it difficult to implement changes because harmonization between functions is challenging. Feedback can be given, but the ever-changing environment makes it difficult to utilize them.

> *“Someone should keep brainstorming sessions or auditions.” (Respondent 8)*

It appears that auditing in terms of brainstorming and quality assurance is considered crucial to maintaining smooth operations and effective control. Brainstorming sessions can generate innovative ideas and solutions as a continuous improvement. There are more stakeholders' perspectives to support this idea.

> *“We have an incredibly competent and capable work community; we can handle any challenge. The cooperation works!” (Respondent 9)*

According to stakeholders' views, cooperation is considered to be highly effective as it effectively addresses various challenges, in particular those that may arise from strict adherence to processes.

The insights reveal the complex interaction between technology and human roles in delivery processes. Automation is increasingly part of daily operations, so understanding its impact on the dynamics of the work environment is very important.

3.3.3 Analysis of the delivery process in Elisa Ring Services

Analysis of request tickets and request types in the Ring delivery process is crucial to understanding the workflow and identifying potential areas for improvement. In order to ensure simplicity and clarity of procedures, it is unnecessary to focus on the overall picture of complex systems. Instead, straightforward emphasis is placed on processes, roughly dividing them into two key tickets.

Two key ticket types that significantly affect the efficiency of the work queue are *automatically generated tickets* from the OmaElisa system and *open orders*, shown in Figure 5 below.

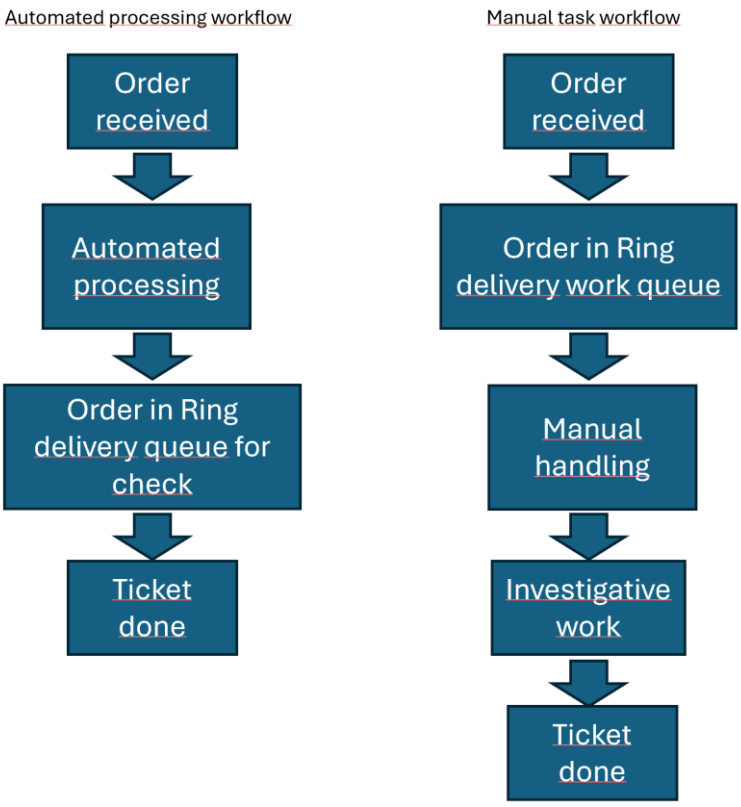

Figure 5. Workflow diagram for both processes.

As seen in Figure 5, manual tasks involve more steps than automated process workflow.

All *automatically generated tickets* are created by OmaElisa, but there is a significant difference between them in whether they start other processes in subsystems. Omaelisa initiates a more extensive workflow process. This process involves automated procedures and the generation of tickets for managing various work queues.

Open orders do not start other processes, instead, they are only textual data and as such are created as textual formed ticket in the work queue of Ring Delivery. Open orders can be practically any text information and orders made by a person. These tickets often hold more complex or unique requirements that cannot be directly automated and are not standardized. Examples are service requests tailored to the customer's special needs. While open orders provide flexibility to meet different customer needs, they can introduce variability and complexity into the workflow, which can lead to delays or inefficiencies if not managed effectively. In the current situation, open tickets consume resources due to their nature requiring investigative work. Open orders therefore have a great tendency to lead to time-consuming investigation work and unnecessary delegation of work. Manual work is also seen as much more time-consuming due to several factors, it increases complexity, human error possibility, lowers efficiency and increases resource utilization.

To put it simply, the workflow difference between these two earlier mentioned is that open orders start automatic procedures which finally lead to the Ring Delivery queue as the ticket to resolve if that somehow fails, while open order put it simply formulates a textual form of a ticket to Ring Delivery queue to solve.

> *“In post-automation work, there are some unnecessary tasks, some are just checked and checked off. There is not always any work to investigate or to do.” (Respondent 10)*

> *“Some checks created by automation do not even belong to Ring delivery workflow queue.” (Respondent 11)*

Generally, automation generates straightforward tickets; Also, as the stakeholders emphasize, there are still unnecessary review procedures or tasks in automation, some

of which are even not part of the Ring Delivery workflow. This is seen as a challenge and a waste of work.

> *“If automation fails that makes ticket to Ring Delivery queue and it needs to be solved” (Respondent 12)*

> *“Reasons for failed automation ticket varies a lot. Usually there is some conflict on the system that does not allow duplicate or automation does not be able to make a request.” (Respondent 13)*

The root causes of automation errors are numerous and complex, due to several different systems. For the sake of simplification, it has been decided to exclude them, focusing on the essentials.

> *“Tasks that come with an open order are often time-consuming work that requires clarification.” (Respondent 14)*

> *“Sometimes open orders are very unclear, and you need to have a crystal ball to know what to do.” (Respondent 15)*

> *"When there is no clear order description for a job, it becomes easy to address it through an open order." (Respondent 16)*

Thus, manual processes following open orders often require investigative questions to resolve issues, which significantly increases the time and effort involved. The complexity of these processes and the need to clarify and address details can lead to delays and reduced efficiency, as resolving issues demands additional resources and time. Understanding the difference between automatically generated tickets and open orders is important to optimizing workflow efficiency and reducing unnecessary workload.

3.3.4 Handling system failures and ticket overflow

Currently, the Ring delivery queue can experience an unusually large influx of tickets within a short period, mainly due to workflow failures. When the workflow encounters disruptions or malfunctions, numerous tickets are rapidly created to fill the queue's pending tasks.

“When failure occurs, there is no direct knowledge where it all started from.” (Respondent 17)

“Most of the time failure reasons stay unknown.” (Respondent 18)

Most of the root causes of the failures are not known. Frequent causes for failures are some errors in OmaElisa automation workflow or integration errors of one of many subsystems.

“Many of those are because OmaElisa doesn't check the information on the Ring well enough and allows you to make an order/change those conflicts with the information on the Ring platform.” (Respondent 19)

“One could say that reason remains unknown for you when the failure is on, but the fault is usually located in the end.” (Respondent 20)

This finding can be interpreted in the context of complex systems, where problems often occur only after events or interactions. In such systems, failures cannot always be immediately traced to a certain point and the reasons may remain unclear. Figure 6 summarizes the steps in handling system failure in the ordering process.

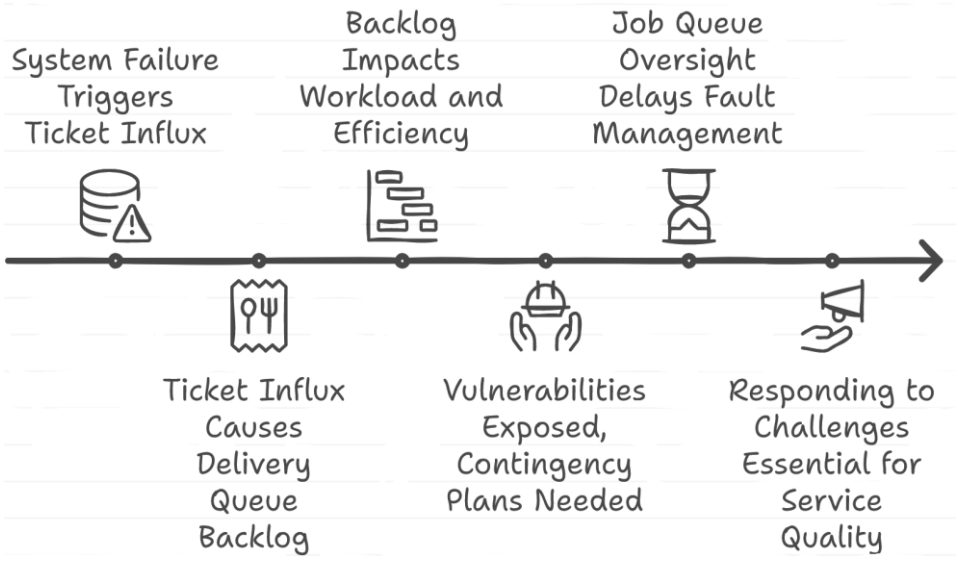

Figure 6. Handling system failure on order process.

Figure 6 shows the steps in handling system failure in the ordering process. When automation fails at any part of the ordering process, it leads to abnormal tickets being created since automation does not stop during the order phase and that means tickets are created to the job queue at an accelerated rate. This sudden influx of tickets is primarily reflected in the delivery queue and leads to a significant backlog in the system, which has a significant impact on the workload, operational efficiency and ultimately the quality of service.

> *“There might be suddenly something like 900 tickets. Without any warning.” (Respondent 21)*

As stakeholders emphasized, It is worth mentioning that a sudden flood of tickets can also highlight vulnerabilities in the system's ability to manage unexpected workload spikes and the need to create robust contingency plans to manage such situations effectively. The criticality of the situation is increased by the fact that the job queue is not constantly reviewed or checked, so there might be a delay between detecting a fault situation and managing the fault. Responding to these challenges is crucial for the smooth operation of the Ring delivery process and maintaining a high level of service.

3.4 Key Findings of the Current State Analysis

This section presents the results from the analysis of the current state of the Ring delivery process. This section summarises the strengths and weaknesses identified in the analysis. Based on these findings, conclusions are drawn about the operational dynamics and development needs of the Ring delivery process.

3.4.1 Strengths and Weaknesses of the Ring Delivery

This section presents a detailed summary of the key findings derived from the Current State Analysis (CSA), which has been conducted to evaluate the Ring delivery process. These findings are categorized into two main groups *strengths* and *weaknesses.*

Table 5. Strengths and weaknesses of the Ring Delivery.

Strengths	**Weaknesses**
Efficient automation of ancillary processes.	Dependence on multiple systems and stakeholders.
Reduction of manual work.	Shortcomings in detecting errors in automation.
Improved efficiency and reliability.	Human Potential errors.
Smooth and flexible cooperation between stakeholders.	Challenges in managing open orders.
Ticket resolution practice.	Redundant tasks in automated processes.
Effective collaboration between stakeholder teams.	Limited transparency around features and future developments.
	Concerns about technology impact.

Table 5 summarizes the strengths and weaknesses of the Ring delivery process.

On the strengths side, *efficient automation of ancillary processes* has reduced the need for manual work in support tasks, improved operational reliability and reduced error rates in the Ring delivery queue.

Existing and constantly developing automation has effectively led to a *reduction of manual work*. Continuous optimization of automation technologies *has improved efficiency and reliability***.** *Smooth and flexible collaboration between stakeholders* also plays an important role in the success of the process, enabling quick problem solving and maintaining seamless coordination that directly affects delivery efficiency and speed. Further supporting this efficiency is the team's well-established *ticket resolution practice*, which optimizes resource use and improves the predictability of daily operations. *Effective collaboration between stakeholder teams* is highly valued and seen as a crucial way to keep pace in a rapidly changing environment.

However, the ring delivery process has considerable challenges. On the weak side, *dependence on multiple systems and stakeholders* is noticed. Not only in automation but also in the interface of the OmaElisa portal. The complex dependency of systems increases the potential for disruption or mistakes, especially when the system is handled by several parties, including customers.

In addition, OmaElisa's system lacks identification, especially concerning automation, and there are *shortcomings in detecting errors in automation*. A fault situation can proceed unnoticed for a long time, which means that a significant number of tickets accumulate in the Ring Delivery queue before the fault is detected.

Potential human errors remain a concern when processing delivery orders, where errors in entering data or making mass changes lead to delays and extra work. *Challenges in managing Open orders*, which are designed to increase flexibility, also present challenges such as manual and investigative work. Finally, although automation improves efficiency, there are still *redundant tasks in automated processes*, resulting in inefficiencies in Ring Delivery queue ticket handling time.

Limited transparency around features and future developments can lead to confusion and distrust among stakeholders, hindering effective decision-making. This lack of clarity may foster *concerns about technology impact*, as users feel uncertain about how changes will impact their roles and responsibilities. Consequently, addressing transparency issues is essential to build trust and promote a more positive perception of technological advancements.

These strengths and weaknesses highlight the current state of the Ring delivery process and point to areas where further enhancements can improve reliability, speed, and resource management.

3.4.2 Selected Focus Areas

According to a current state analysis of this thesis, the following selected key focus areas have been identified for targeted improvement measures. This section emphasizes areas that necessitate special attention and development. Table 6, provides an overview of key focus areas for improving the delivery process.

Table 6. Selected focus areas.

Focus Area	Description
Eliminate unnecessary work	The key objective is to eliminate unnecessary work, consider changes in the operating environment, and ensure that development remains continuous and sustainable. However, the fear of technology highlights a critical need for effective change management.
Improving order management	Another area of development is open orders. Clarifying open orders would also free up resources.
Strengthen the management of system failures	This refers to measures that reduce the effects of system failures and ensure the stability of the delivery process in faulty situations.

One of the main goals is to eliminate unnecessary work and ensure continuity of development in a changing environment. Despite the improvement achieved through development, this measure is necessary as it would further reduce the additional load on the delivery process and free up resources while seeking to create better-added value and add resources for more creative customer service that improves customer satisfaction. The fear of technology highlights the critical need for change management, as limited transparency around features and future developments can intensify this apprehension.

Another focus area of development is the management of open orders. Clarifying and standardizing open orders is also necessary to reduce wasted work and possible human errors to minimize order errors and improve cost control. This improvement would make order management more efficient, freeing up resources from investigative work. This would allow the delivery team to focus on customer service and importantly towards more creative tasks.

The focus area of the last observation is to strengthen the management of system failures, with an emphasis on both prevention and rapid detection. The aim is to minimize the occurrence of disturbances whenever possible and to ensure that potential disruptions are identified and corrected without delay. This requires both proactive measures to reduce the likelihood of disruptions and reactive strategies to mitigate their

effects. These measures can be used to ensure a smooth and efficient delivery process also in exceptional situations while ensuring efficient continuation of operations and customer satisfaction.

The whole environment is perceived as changing and fast-paced, which makes intellectual efforts and the dissemination of education and knowledge very important. Due to rapid system changes and a wide operating environment, the need for continuous improvement has been emphasized. This also highlights the important role of auditing in developing operations, ensuring quality and effectively implementing information.

The next section provides a further analysis of existing knowledge and best practices from the industry literature related to the identified priority areas. The aim is to deepen the understanding of key themes that affect the development of the research area and to present practical solutions that can improve operations and process efficiency.

4 Available Knowledge and Best Practices on improving Ring delivery

These problem areas are each in their own subheading and focus on a specific challenge within a chosen focus area, which includes *eliminating unnecessary work, improving order management,* and *strengthening management of system failures*. Each of these subheadings provides a comprehensive literature review to provide an overview of the current state of each sector and related best practices.

4.1 Eliminating Unnecessary Work

This section discusses eliminating unnecessary work through a comprehensive literature review. The objective of this section is to gain knowledge and identify methods to effectively reduce waste and streamline workflows, especially to tackle the challenges described in section 3.4.2. By analyzing different sources and existing research, the aim is to identify the best strategies and tools.

4.1.1 Lean Approach to Waste Reduction and Process Improvement

Optimizing the business process begins with identifying the problem and aims to find a solution to achieve the desired outcome. After that, problem areas are identified and opportunities for improvement are identified. Process mapping is used to analyze inefficient parts of the workflow, select the best solutions and implement them. Before large-scale commissioning, the functionality and quality of the process are assessed. Once a new process is in place, its effectiveness is monitored and adapted to changing needs, ultimately overseeing the process and gathering feedback for new challenges that arise (Shaheen, 2024:17-18).

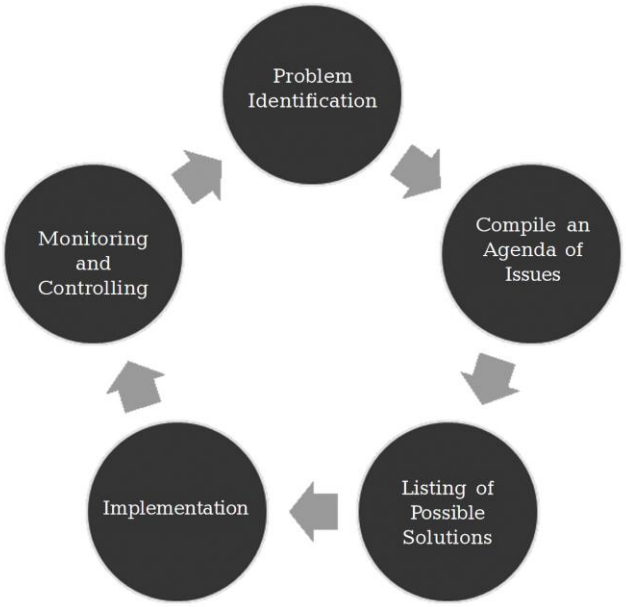

Figure 7. Business process optimization diagram (Eby, n.d.).

Figure 7 shows the above-mentioned speps of business process optimization. One of the key principles of Lean is to identify and remove waste, or "muda" which is a Japanese word meaning waste. This covers activities that do not add value. By systematically identifying and eliminating these waste sources, organizations can significantly improve their efficiency and adaptability.

Lean philosophy emphasizes continuous process improvement by identifying and eliminating activities that do not add value. This capability supports effective adaptation during periods of significant change and technological transformation especially in Industry 4.0. The biggest challenge still is the employees' resistance to change, the lean philosophy is an important tool during the transition period towards the Industry 4.0 revolution because it can reduce investment costs (Trstenjak and Cosic, 2019: 16).

> Lean EA is a type of approach that combines Lean principles with enterprise architecture (EA) practices, improving organizational agility and efficiency. Visual controls like Kanban boards would increase process transparency, and automation tools reduce manual work in EA processes. Continuous stakeholder engagement ensures EA meets business needs. Although the continuous improvement of core keys, its implementation faces challenges such as resistance to change and difficulties in measuring value. (Vayyavur, 2024: 942).

Lean’s focus on continuous improvement and waste elimination is crucial for organizations facing rapid changes and complex challenges. A study by Basulo-Ribeiro, Amorim and Teixeira (2023) looked at a pilot company with a high level of Lean maturity

but still low digital maturity, focusing on initiating or accelerating the digitalization process. The conclusion of the study states that many companies face challenges in adopting Industry 4.0 technologies and need a strategy for digital transformation (Basulo-Ribeiro et al. 2023: 102).

In industries where product life cycles are long and investment costs may be higher, developing a systematic approach to waste identification and process optimization is crucial. These industries must adapt Lean principles specifically to their own contexts, focusing on both incremental improvements and strategic changes (Barabadi and Nouri, 2023: 3383).

4.1.2 Resilience against VUCA

This changing VUCA environment requires companies to be able to respond quickly and effectively to, changes, threats and opportunities. Management approaches, which often are based on typical top-down decision-making, may not be able to respond efficiently to these challenges (Barabadi and Nouri, 2023: 3382).

Millar et al. (2018: 11) emphasize that executives must prioritize agility, dexterity, flexibility, and resilience to effectively manage VUCA environments. This involves regularly updating capabilities and fostering resource fluidity, characteristics commonly found in startups but often missing in mature enterprises. Organizations should enhance design, foresight, and systems thinking through new skills and tools to thrive in these conditions.

Then on the other hand, in VUCA environments, the Lean philosophy coupled with industry 4.0 technologies offers a solid framework for improving efficiency and agility. The use of Industry 4.0 tools, like RPA, etc, enables organizations to rapidly adapt to changing conditions, enhance process visibility, and implement data-driven improvements. Companies find that adopting Industry 4.0 technologies and Lean Management requires a simultaneous approach, but high costs and cybersecurity risks hinder smooth integration (Peças et al. 2021: 7). While the impact is still limited, Lean practices are perceived to have a greater positive effect. However, it should be noted in terms of VUCA, that the continuation of old processes requires change from strong leadership and role modeling. Leaders promote agility by supporting strategic agility, modeling learning, and creating a culture that is open to change (Baran and Woznyj, 2021: 9).

4.1.3 Automating after Lean

Automation gives organizations also the agility and scalability needed to quickly adapt to changing needs, which promotes competitiveness through faster, more cost-effective and more innovative operations.To enhance the likelihood of successful RPA adoption in organizations, it is crucial to carefully select the processes to be automated (Moreira et al. 2023: 251-252).

It has been recognized that process errors such as poor process selection, lack of standardization, and emphasis on unoptimized processes can lead to programming errors and increased inefficiencies. In RPA implementation, process standardization and maturity levels must be at a high level (Dogan et al. 2024: 20). In this context, data maturity measures how advanced a company's data analysis is.

As Bortolotti, Romano and Nicoletti (2010: 583) observe, automation (data extraction from information systems) can significantly enhance measurement accuracy and speed after streamlining manual processes. It also should be clear when the processes should be streamlined and when they should be automated in worst case errors and waste could be automated (Bortolotti et al. 2010: 580). In addition, Bortolotti et al. (2010: 584) emphasize the need for continuous monitoring in the control phase, stating that "The process must be constantly monitored measuring the reference metrics. A process not monitored could degrade and cause huge losses due to a possible customer satisfaction decrease." This proposes the need for continuous monitoring of automated processes.

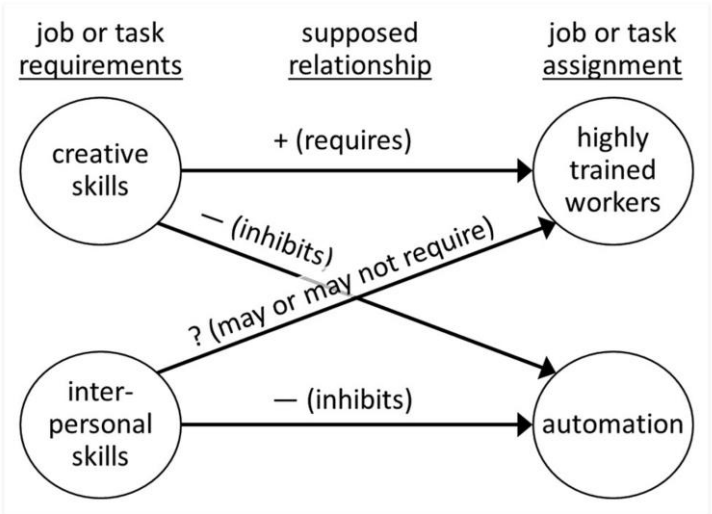

Figure 8. Illustrates the automation model of Sampson (2021: 126).

Figure 8 presents a model of literature explored by Sampson (2021) that includes the claim that if a job or task requires creativity, tasks that require creativity are oriented towards highly educated, skilled workers, suggesting a positive association between creativity and professionalism. Creativity may prevent the task from being automated.

Research shows that RPA implementation enables the automation of many repetitive business operations, saving time and resources. This often leads to structural changes in organizations as much of the work is automated. RPA improves optimization and reduces the margin of error. Its use can vary in areas such as process building, analytics, and auditing, and it allows for greater data collection and utilization, supporting the development of the digital workforce in the long run (Sisodiya, Prabhu and Ashok, 2024:498). Since these tasks are often prone to human error, automating them can significantly improve the efficiency of an organization's workforce and reduce the risk of errors. At the same time, these tasks are often very critical and valuable to the company's operations, so automating them not only increases efficiency but also improves the quality and reliability of operations. In this way, RPA helps organizations make better use of their resources, allowing employees to focus on more complex and strategically important tasks like in this case focus to better CX this is also noted by Hardayal Prasad (Enterprise Innovation 2018) "We believe RPA will lead to significant operational efficiencies while helping us to further enhance customer experience."

In addition to its core benefits, the concept of hyperautomation is gaining importance as it combines RPA, machine learning, and other AI technologies to automate complex business processes. This can transform how organizations operate, enabling them to automate entire workflows and make decisions more quickly and accurately than ever before by integrating with data lakes (Kothandapani, 2021:23). RPA is a rapidly evolving technology, making it easier for companies to adopt. Current economic conditions and advancements in machine learning and AI suggest that process automation with RPA tools will become more accessible, making RPA a key component for businesses (Ghouse and Sipos, 2022: 34).

By combining automation, process management and Lean philosophy, organizations can become more efficient. Automation speeds up repetitive tasks and reduces manual errors. When automation handles monotonous and tiring tasks, employees can focus on more creative and meaningful tasks. This can improve employee job satisfaction and reduce employee turnover. According to Koffarnus, "academic research shows that

organizations augmented by automation technologies are 33% more likely to be 'human-friendly' workplaces, in which employees are 31% more productive" (Harfmann, 2021).

4.1.4 Handling the Future

38 years have passed since Masaaki Imai (1986) proposed Kaizen as Japan’s competitive success. Kaizen helps create a comfortable work environment by enhancing communication among employees, which boosts their well-being and motivation. Additionally, it fosters a positive mindset, empowering everyone to contribute ideas for improvement in a positive way (Jaca et al. 2014: 4583). This method would make an enhanced environment where minor but still continuous improvements cumulate in substantial advancements over time via internal meetings.

Continuous improvement is based on the organization's commitment to innovation and learning. Quality work focuses on improving operations, thinking openly, seeing mistakes as learning opportunities and actively seeking new ideas. According to Gregg et al. (2018: 1), companies that effectively harness both creative processes and data analytics achieve growth rates twice as high as those that do not. This underscores the need for organizations to encourage an environment where creativity and analytical thinking are integrated. By doing so, the company to innovate and improve operational efficiency simultaneously.

Secondly, continuous improvement requires effective data collection and analysis. Organizations need to track performance, collect feedback from customers and employees, and analyze this data to identify opportunities for efficiency. For example, McKinsey interviewed more than 200 CMOs and CMOs and the performance of their companies. The studies found that marketers who combine data and creativity increase their revenue twice as much as average (Gregg et al. 2018: 3)

Continuous improvement requires also management commitment and employee support. Management must create an environment where continuous improvement is a priority, and employees are encouraged to participate in improvement measures. The role of management is to provide resources, support and encourage continuous improvement projects and to ensure that improvement measures are integrated into the organization's operations to ensure success (Holtskog, 2013: 577).

In particular, Holtskog (2013) also emphasizes that employees' understanding of goals improves when these goals are aligned with their work. Employees generally appreciate the opportunity to participate in setting goals and feel that they have influence. "If your nearest leader is engaged and you understand the goals, the feeling of commitment towards doing improvement work will suffer if the top management team does not prioritize it" (Holtskog, 2013: 577). Also, the study by Lizarelli et al. (2021) confirmed positive and significant relationships between continuous improvement and incremental innovation of employees and did not find significant difference between Lean, Six Sigma or Lean Six Sigma.

Despite its numerous benefits, implementing Lean practices is often fraught with significant challenges. Research indicates that more than 70% of companies attempting to implement Lean face considerable barriers, including insufficient management engagement, lack of employee involvement, and cultural or systemic obstacles that slow progress (Nouri and Barabadi, 2023: 3383).

4.1.5 Change Management

Rifkin (1995: 9) pointed out that with automation, "large numbers of human beings could be liberated from long hours of labor in the formal marketplace, to be free to pursue leisure time activities". Automation streamlines repetitive tasks, which enables fast and correct execution and frees up human resources for more complex tasks. By reducing the risk of human errors and ensuring consistent performance, automation improves the quality and reliability of services. This is supported also by the conclusion that productivity growth in some industries enhances operational efficiency, though it can also shift labor’s share away from human resources toward capital (Autor and Salomons, 2018: 51). Therefore, while automation enhances product and service quality, it also highlights the importance of understanding its broader economic impacts, including labor market effects.

Research also shows that while automation may reduce employment in certain industries, these losses are often offset by gains in others, such as increased demand in customer industries (Autor and Salomons, 2018; Dekle, 2020:13). However, some studies find that automation can reduce employment, particularly in developing countries. From 2005 to 2014, robots caused a global employment decline of 1.3%. In developing countries, the impact was about 14%, compared to -0.54% in developed countries as found in the study by (Carbonero et al. 2018: 8). The overall effect of

automation on employment depends on multiple factors, including industrial diversity and economic conditions, with developed nations often seeing positive outcomes, while the impact is more nuanced in less developed regions (Filippi et al. 2023: 14).

It is also important to note that the introduction of widespread RPA use may alter established procedures and workflows. Employees may fear that automation will take their jobs. The current labor market dichotomy may level out, as computers and automation mainly target low-skilled and low-paid jobs. However, the result suggests that as technology develops rapidly, low-skilled workers will move into tasks that cannot be easily automated (Frey and Osborne, 2017: 269)

However, organizations may also face challenges such as change resistance, different data integration problems technical issues and limited resources. Effective change management techniques can help with these issues like investing in the right technology, and providing adequate training can help overcome obstacles and achieve successful process optimization. For example, the study "Change Resistance Management, Strategic Change Management Practices and Service Quality in Countries in Western Kenya" by Nyambane et al. (2023: 176) finds that managing resistance to change has a significant impact on the relationship between strategic change management practices and service quality.

Resistance to change, once seen as an obstacle, can now act as a stimulant if employees see the benefits of change. Researchers believe that resistance can be turned into acceptance with the right training and counseling. Effective change management focuses on training employees and involving them in change (Shaik et al. 2023:1069).

4.2 Improving order management

This section focuses on ways to improve order management through a literature review. The goal is to increase understanding and identify effective strategies for the order challenge. The aim is to identify best practices and innovative approaches by analyzing data from different sources and literature studies.

4.2.1 Defining better, measuring later

Six Sigma is a statistic-driven quality development approach based on minimizing variability and removing errors from processes.

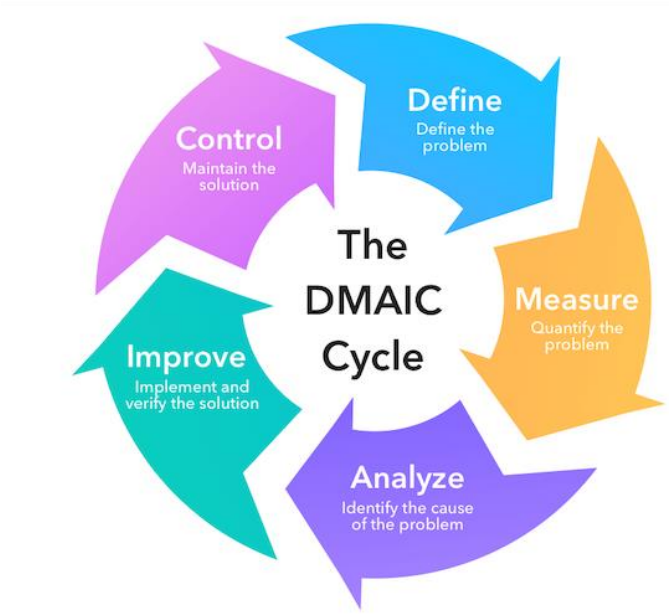

Figure 9. DMAIC-cycle (Six Sigma Institute, n.d.).

Six Sigma is a management method and development protocol that proceeds systematically. Figure 9 shows the DMAIC cycle according to the DMAIC model. The first step Define means determining the problem and in this phase, stakeholders must clearly define the objective (Monday, 2022), Measure the original process, and analyzing data in the analysis phase. Improvements is implemented in Improvement and control ensures the success and maintenance of the improvement. Six Sigma is a strategy, not just an initial step. It requires a long-term, fact-based plan to improve the company (Tayntor, 2007: 10; Monday 2022).

Using the five steps of DMAIC in Six Sigma, it has been observed that the overall performance of the production planning process has improved after integration (Chang et al. 2012:306). Lean and Six Sigma both aim to eliminate wasted space and improve efficiency, but in a different way. Lean focuses on improving process flow, while Six Sigma strives for error-free, specification and consistent results (Sodhi et al. 2020: 28).

As well as Pareto is a method presented to identify and prioritize the most significant factors that contribute to a problem or outcome. It is based on the principle that, in many situations, roughly 80% of effects come from 20% of the causes (Noroozian, 2024: 1441). Accordingly, also KPIs can be defined according to hardness, soft is not directly measurable but qualitative, such as customer satisfaction, employee motivation, or company reputation. the other hand, is measurable quantitative, such as the number of customers (Domínguez et al. 2019:30). Defining KPIs with trendlines improves this approach by allowing organizations to evaluate and compare performance across processes. This method ensures consistency with the organization's goals and maintains high standards of process performance and customer satisfaction. In addition, it provides valuable insights into performance trends across contexts, facilitating data-driven decision-making and targeted improvements (Noroozian, 2024:1442).

4.2.2 Strengthening Quality improvement via audits

As Nazarov and Klarin (2020: 550) highlight in their comprehensive analysis which consisted of 2986 documents of Industry 4.0 research, emphasizes that I4 consists of various subsystems, such as cyber-physical systems (CPS), the Internet of Things (IoT), digital twins, automation, big data, and sensors, all of which are individual systems contributing to the holistic nature of I4. In this context, the importance of technology auditing cannot be overstated, especially in organizations characterized by high automation and operating within the Industry 4.0 paradigm. A comprehensive analysis by Solanki, Mehta, and Shukla (2024) also concludes that RPA has evolved since the early 2000s to transform traditional audit methods. RPA turns to matured and expanded its role in auditing beyond routine tasks, thus it might be useful in improving quality.

Vitliemov and Penchev (2022: 4) state that the management of highly automated industrial organizations should perform a technological audit continuously, and the audit must last to ensure the necessary quality and accuracy. Regular audits help organizations ensure their technical processes meet industry standards and identify areas for improvement. This proactive approach not only ensures operational efficiency but also strengthens an organization's ability to use automation for sustainable success.

Organizations can effectively take advantage of ISO certification, in which quality auditors play a key role, to promote and strengthen a quality culture and continuous improvement. The high-level finding in the study of Terziovski and Power (2007: 161) was that organizations that seek ISO 9000 certification proactively through a continuous

improvement strategy are more likely to derive significant benefits as a result. ISO 9000 certification can promote a quality culture within organizations, with quality auditors playing a key role. A strong positive link exists between continuous improvement strategies and enhanced business performance.

4.3 Strengthening Management of System Failures

This section focuses on system malfunctions through a literature review. The aim is to deepen understanding and find answers through literature to the third challenge, which was identified in section 3.4.2. This section focuses on identifying best practices to solve the challenge, based on a thorough evaluation of various sources and analyses made in the literature.

4.3.1 Impact of Technology

The impact of technology on the operation of the organization is multifaceted, affecting almost every aspect of modern business. This section discusses how technological advances shape work processes, innovation and practices. Digital transformation, a critical issue across all sectors, fundamentally alters customer relationships, internal processes, and value creation (Zaoui and Souissi, 2020: 621).

Within the framework of Industry 4.0, the shift toward automation is driving significant changes in work processes, requiring employees to develop new technical skills to keep pace with evolving technologies. Organizations must prioritize continuous learning and development initiatives to equip their workforce with the expertise needed to expertise advanced systems like artificial intelligence, IoT, and automation. The research of Susskind and Susskind (2018: 135) identified 13 new roles that will be central to future professions, including data scientists, knowledge engineers, process analysts, and digital security guards. They delve into the specifics and significance of these roles in their book *The Future of the Professions*.

Companies with more advanced business process management are leveraging Industry 4.0 and automation more efficiently, combination of Industry 4.0 technologies with RPA is inevitable (Moreira, Mamede and Santos, 2023:251-252). Since Industry 4.0 is a significant challenge for today's businesses, this finding is especially useful for companies operating in the manufacturing sector. Improving the level of process control can increase readiness for digital transformation, increase production efficiency, improve

performance monitoring, and bring cost savings. On the other hand, challenges in implementing automation, such as high costs and difficulties in scaling to existing infrastructure (Gažová et al. 2022: 1506.)

Organizations should make digital transformation and quality strategy an integral part of their corporate strategy and adapt their management approaches to new ways of working. Organizations that want to implement this change and overcome its challenges will benefit from higher quality and competitive advantages, such as improved customer satisfaction, quality of the product or service, and efficiency. (Antony et al. 2022: 1184.)

As in terms of technological impact, it has been shown that collaboration is key to reaping the full benefits of digital platforms, meaning that taking your own company into account when deploying digital platforms is not enough for managers. It is critical that partners are also considered and that a strategy is drawn up for each cooperation. This is supported by Reim et al. (2023: 3940).

It can also be stated that the impact of technology on this kind of global access to knowledge and information organization is wide-ranging and transformative. By taking advantage of technological advances, social platforms and the opportunities they provide, organizations can achieve sustainable long-term success in the modern digital economy (Rosário and Dias, 2023: 8). According to a recent study (Lista Rossetti et al. 2024:346), 84% of studies on combining Industry 4.0 technologies and Knowledge Management have been published since 2018. This refers to the growing importance of the field and the associated academic interest. Also an interesting finding related to that study is that Knowledge Management development often occurs through the combined effect of several technologies (Lista Rossetti et al. 2024: 354).

4.3.2 Handling failures

It is important to note that real-time process monitoring is the area receiving the most focus in efforts to improve optimization and safety (Qasim et al. 2021:1). A study by Webert et al. (2022) defined fault handling in the Industry 4.0 area. The survey focused on medium-level fault-handling processes. FMEA was presented in this article as a method that supports experts in making decisions about machine risks. A comprehensive method was finally developed to cover the industry's entire mid-level fault handling process.

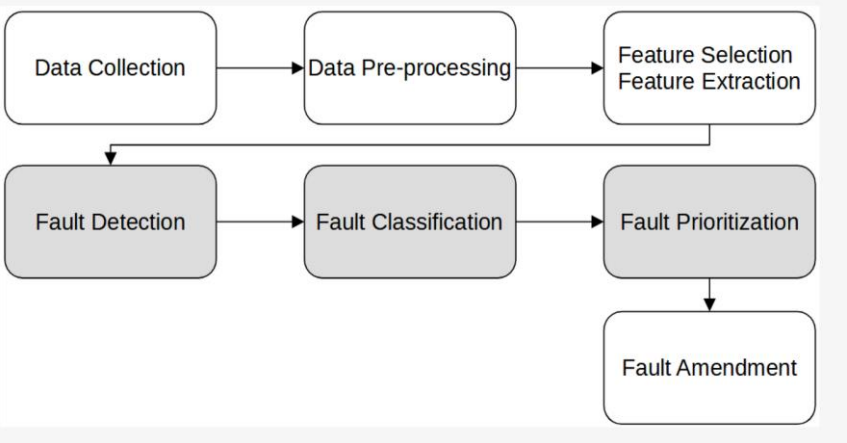

Figure 10. Fault handling process by Webert et al. (2022: 3). Pls keep that small.

Figure 10 illustrates the developed process of fault handling. The process begins with data collection, pre-processing, and feature handling. Industry 4.0 and the consequent increase in computational resources, complexity and digitizing processes make model-based and data-driven approaches challenging (Webert et al. 2022: 13). Worth to mention, that faults can indicate intrusions or attacks. Some authors recognize that fault detection can be used for attack detection (Housh and Ohar, 2018: 133).

Failure Modes and Effects Analysis (FMEA) is a method of risk and reliability analysis. It’s a systematic methodology used to identify and assess potential failures within a system, process, or product, along with evaluating their potential effects on operations or outcomes. Since understanding a complex problem is an eventful process, the difference in the opinions of experts, due to lack of experience or insights, may include a different assessment of each specialist. This can cause experts to disagree in situations of uncertainty (Wu et al. 2021:1420).

While FMEA is effective for identifying and mitigating component-level risks and provides a clear metric for prioritizing issues, STPA offers a broader perspective on system control and can uncover hazards related to causal control issues that FMEA might miss. Combining both approaches provides a more comprehensive view of the risks, addressing both individual component failures and broader systemic control issues (Sulaman et al. 2019: 383).

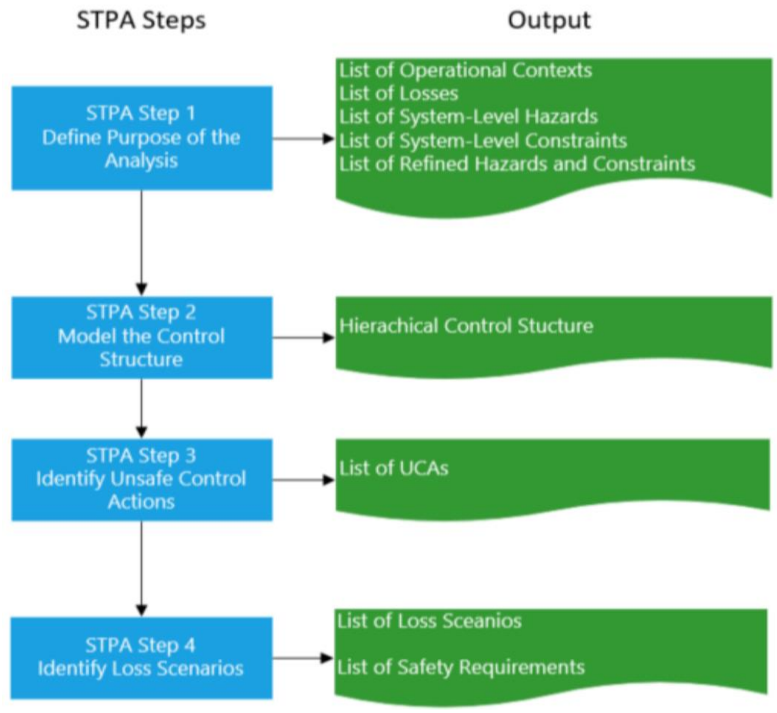

Figure 11. Key steps of STPA (Berger, 2024: 1).

As seen in Figure 11, STPA starts by analyzing the system, purpose and environment. Defining boundaries, components and interactions that link to analysis. This involves outlining the entire system to understand how the system operates within its context.

Followed by developing a detailed control structure diagram. That includes mapping software architecture, including elements like processes, control commands, data flow, user inputs, and system outputs. Also, control flow within different compounds is illustrated and visualized.

The third phase is to find scenarios where software might produce unsafe or incorrect actions. These might be missing functionality, incorrect inputs, process delays or improper handling exceptions like failure to validate user inputs or failure to produce orders on the process.

The fourth phase would be identifying hazard procedures. For each risky control action. Hazards in software systems might include data corruption, system crashes, or security vulnerabilities. Reliability should be assessed in this phase. This phase includes also root cause analysis where the underlying cause of actions is investigated thoroughly. Implementation errors or assumptions are identified. This might include inadequate

testing procedures or poor coding practices that lead to failures Berger, 2024: 26). Figure 12 shows steps for STPA extension method.

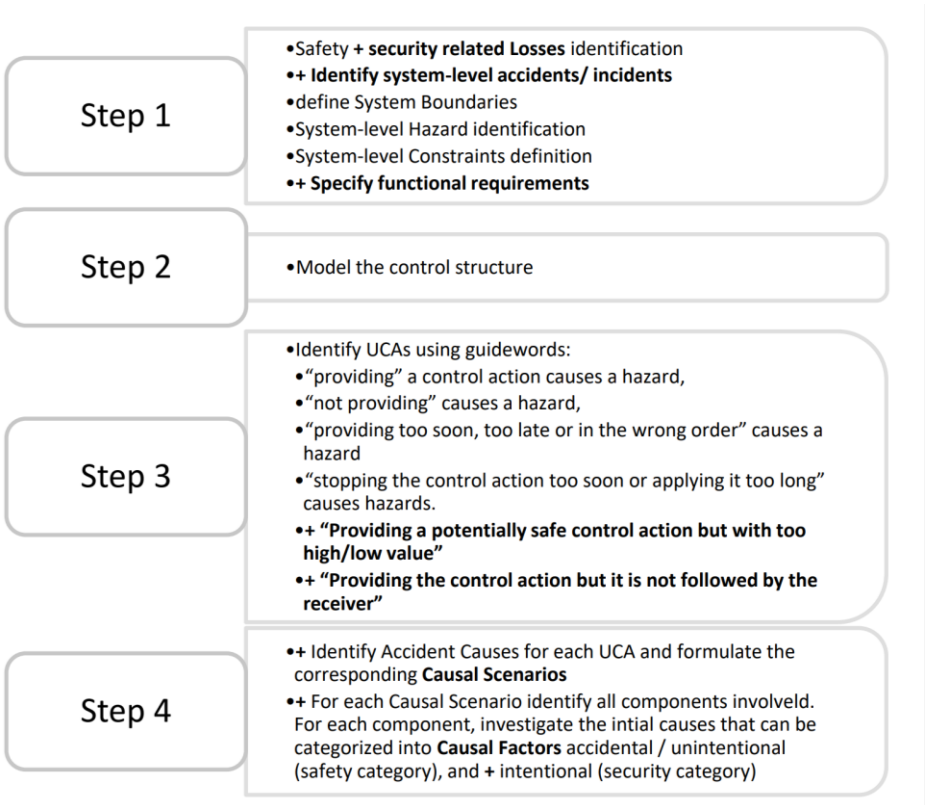

Figure 12. STPA-extension method (Berger, 2024: 34).

Figure 12 shows the so-called "STPA-Extension" method defining the loss scenarios as Causal Scenarios, which describe the potential effects of Unsafe Control Actions (UCAs. These effects are assessed by applying a set of accident causes, including control input errors, inadequate control algorithms and poor actuation of actions. Each component involved in a causal scenario is then analyzed for potential failure modes. Finally, the analysis identifies the underlying causal factors behind these failure modes, examining each system element for failures, vulnerabilities, and intentional actions. Causal factors are categorized as either accidental or intentional to better understand the associated risks. (Berger, 2024: 34.)

Also, anomaly detection is often used to identify and eliminate anomalies in datasets, and Cohen et al (2023) introduced a new Automated Anomaly Detection (AAD) method dedicated to detecting anomalies and analyzing their common characteristics. The AAD method seems to identify non-anomalous features well by comparing and filtering techniques that do not fulfill the predefined threshold (Cohen et al, 2023:6).

4.3.3 Handling risks

Modern risk management has two main approaches: reactive, which reacts to risks as they arise, and proactive, which systematically prepares for potential risks. Also, worth mentioning that risk management methods can be classified as follows, risk avoidance or risk neutralization (Kochkodan and Petryna, 2024: 236 - 237).

Analysis is necessary as a first step. The ultimate purpose of the phase is to understand the processes of the current state, identify inefficiencies and develop areas for improvement. The number of approaches to the application of risk analysis methods is limited. Risk analysis methods already exist, so they can be used instead of developing new technologies (Suriadi et al. 2014:954).

Carrying out a risk assessment is also an essential part of the analysis, Organizations need to thoroughly understand their current processes to identify inefficiencies, bottlenecks, and areas for improvement. When designing a solution, be it programming, infrastructure, or another area, clear basic principles help to structure ideas and transfer them to paper. The same applies to RPA design: adherence to principles ensures a solid and resilient plan (Sahgal, 2023). Conducting a risk assessment to provide management is an essential part of this critical analysis, as it identifies potential risks that may pose challenges in the process from an operational perspective (Yendluri et al. 2024: 4).

K-PIMRBP (the knowledge-based process of the integrated management of risks and business processes) model of seven different activities by Maamir and Derghoum (2021).

> Process starts Contextualization creates context by targeting goals for both IKMP which stands for Integrated Knowledge Management Process and BPRIM (business process-risk integrated method) processes. Knowledge Capture collects existing information about risks from employees who have experienced or handled them. Information about new risks is generated in the organization's data. Knowledge sharing refers to the sharing of information created based on preventive procedures. Data storage is associated with the recording of preventive procedures in the organization's knowledge repository. Knowledge Application uses these preventive procedures to eliminate the causes of risks or to minimize their effects. Finally, Knowledge Updating ensures that if the preventive procedures are not effective, the knowledge is then revised (Maamir & Derghoum, 2021: 200).

Risk assessment involves identifying internal and external events that may impede an organization's objectives, thereby establishing a basis for effective risk management. Inadequate quality control jeopardizes RPA investments when untested or unprotected

RPA scripts cause disruption. To reduce risks, it is also recommended to establish quality control policies along with risk management regarding RPA (Hong, Ly, and Lin, 2023: 133-137). Also, high controllability ratings indicate that the risks linked to RPA projects can be successfully managed and reduced through careful planning and execution (Schlegel et al. 2024:190).

Also, Kaviani and Galli (2018) stated in their study that risks significantly impact the implementation and maintenance of continuous improvement programs. Through the meta-analysis, they were able to identify themes and connections related to this process. Although many organizations adopt continuous improvement programs, their long-term maintenance is often challenging (Kaviani and Galli 2018: 65). This is partly because frameworks designed to enable organizations to select the most suitable methodology are still limited in availability.

4.4 Conceptual Framework

The most important elements of the topics discussed above are summarized in the conceptual framework of this thesis for streamlining the delivery process.

Figure 13. Conceptual framework of the thesis.

As shown in Figure 13, the conceptual framework for this thesis comprises three main focuses: *Lean, Automate*, and *Improve*. *Lean* philosophy focuses on identifying and eliminating non-value-adding activities, optimizing workflow processes, and fostering a culture of continuous improvement (Nouri and Barabadi, 2023: 3395). By first applying Lean principles, organizations can streamline processes, reduce waste, and create more efficient workflows. This preparatory step ensures that processes are already optimized before automation is introduced and more importantly that no waste is automated, thereby enhancing the overall impact of automation.

Also, Bortolotti et al. (2010: 580) emphasized the importance of applying Lean before integrating automation. By automating optimized processes, organizations can achieve higher levels of accuracy and operational effectiveness, reinforcing the benefits of the implementation.

If the automation process needs creativity, then it is not well suited for automation as Sampson (2021: 125) suggests. This is because creativity requires complex thinking, adaptability, and understanding of context, which are difficult to program into automated processes. In other words, although the profession may require high levels of creativity and thus be resistant to automation, individual tasks have fewer of these requirements.

The next focus is *Automate* which involves Industry 4.0 technology, automation, and process management. The relationship between Lean and Industry 4.0 is largely based on the use of technology, and the growth of this value is systematically examined. The more tools and technologies are integrated, the more iterations are generated, and the value increases significantly (Moraes, Carvalho and Sampaio, 2023: 16).

Improving the value stream of technology and performing problem corrections reduces the accumulation of problems and technical debt. Daily work can be made more efficient by allocating time to reduce technical debt, fix bugs and refactor problematic code. It is recommended to perform these tasks iteratively (Kim et al. 2016). This approach fully ensures processes are optimized through lean and automation with the latest innovative technology tools.

Effective process management also incorporates risk management to safeguard the value created through process improvement. Real-time monitoring and risk mitigation are essential for maintaining efficient and effective automated processes. The goal of risk management is to avoid problems and adverse outcomes, by preventing or

influencing. A failure is a problem that is defined as the abnormal behavior of a system and can therefore be treated as an attack-like action (Housh and Ohar,2018:133). Effective risk management requires adherence to certain principles to maximize benefits and minimize disadvantages by striving for the most optimal results. (Kochkodan and Petryna, 2024: 237).

The final phase is *Improve* where also Kaizen as Imai (1986) emphasized for a comfortable work environment with communication and to make a positive environment towards continuous improvement. Also, regular audits are performed to keep the quality of the procedure going strong. Consistency and perseverance are essential to promote effective motivation and continuous improvement (Jaca et al. 2014:4584).

Once the modified procedure is fully implemented, its effectiveness and efficiency should be evaluated. Business processes evolve in response to shifts in market dynamics and organizational operations. To confirm that the updated process delivers more value than the previous one, ongoing assessment and monitoring are essential (Schmelzer and Walch, 2022).

The study by Begeç and Akyuz (2023: 17) highlights that executives in technology-focused cooperative networks need a comprehensive perspective that encompasses various stakeholders, aspects, elements, workflows, interconnections, and collaborations. They must also recognize the complexities of VUCA when managing transformational management. For this reason, it would be necessary to follow an iterative approach, as the process may involve numerous changes, especially as new services, tools and features emerge over time. A similar perspective is shared by Millar et al. (2018) who stated, “Success in VUCA environments requires thoughtful reflection on renewal from within an organization through transformational skills in each employee” (Millar et al. 2018: 11) in their study.

In the next section, this conceptual framework is adapted to the needs of the organization based on industrial experience, compiling appropriate sections from the existing literature. In that adapted form, this framework will serve as a guide for streamlining the delivery process at the case organisation.

5 Building Proposal for Improving the Delivery Processes in Elisa Ring Services

This section provides the results of developing the proposals for this thesis. The primary goal was to enhance and refine the areas identified during the current state analysis, utilizing the conceptual framework as a guiding tool for the development of proposals. Based on relevant literature and best practices, the proposals are designed to combine the findings from the current state analysis and conceptual framework presented in Sections 3 and 4, and then developed together with the key stakeholders into the Initial proposals.

5.1 Overview of the Proposal Building Stage

The proposals are based on data collected from a work management system, current situation analysis, stakeholder perspectives and the author's own experiences of the target company. Based on these, three important proposals have been identified that respond to both current needs and requirements. In formulating the proposals, special attention has been paid to future needs to maintain the current way of working and to maintain continuous development monitoring.

In developing these proposals, a key consideration was to maintain the existing work methods and organizational culture rather than implementing drastic changes. The focus was on preserving the established practices while integrating new strategies that align with case company's continuous improvement model. In an article by Kauppalehti (n.d.), Lean guru Jeff Liker highlights Elisa as a model company in his new book. This approach highlights our commitment to building upon the strengths of the current system, emphasizing ongoing development and innovation to drive future success.

Stakeholders actively participated in the proposal development process by providing suggestions and valuable insights into the challenges that have emerged. Cooperation during the preparatory phase ensures that the proposals raised are based on different perspectives and the expertise of stakeholders. These issues are discussed in more detail in section 5.2, where stakeholders' proposals are discussed in detail. Meetings have been held throughout the process at regular intervals to highlight identified shortcomings, track progress and propose improvements. Regionally dispersed stakeholders have been in touch Actively through Microsoft Teams.

By taking into account the input of stakeholders and fitting them into the conceptual framework, the proposals aim to respond to the identified challenges effectively and take advantage of opportunities for improvement. This approach promotes a holistic and evidence-based approach to proposal development, ultimately improving the overall quality and relevance of proposed interventions.

5.2 Key Stakeholder Inputs for Proposal Building

This reports on the inputs to the development of the proposal provided by stakeholders. These contributions are important for building and shaping the direction and content of our proposal by adapting findings from current state analysis and insights from the conceptual framework.

Table 7. Key suggestions for proposal building with findings from the key focus areas and the conceptual framework.

Key focus areas (Data 1)	**Conceptual framework**	**Suggestions from stakeholders, summary (Data 2)**	**Descriptions of suggestions**
Eliminate unnecessary work	The literature underscores the role of technology and lean principles to optimize organizational processes.	Suggestion using Robotic Process Automation (RPA) to eliminate waste in the delivery queue.	Implementing RPA to streamline processes. Organizations can significantly reduce inefficiencies in delivery processes by automating repetitive tasks and leveraging CSA-identified incidents to guide implementation.
Clarify open orders	The literature emphasizes continuous improvement for organizational efficiency and results.	Recommendation to improve the clarity of textual information in open orders. They stress the significance of continuous improvement in organizational operations.	Importance of clear communication in open orders. The open ordering process could be enhanced by formatting the text in a more directive and guiding direction.

Improve System failure management	The literature highlights the role of technology in mitigating risks and enhancing operational resilience.	System failure management is advocated by stakeholders. Technological improvements can prevent risks. It would be possible to improve the alarm with a pager-style application on the mobile phone.	The need for proactive measures to address system failures is underscored by stakeholders. Implementing technological solutions and setting up contingency plans are essential steps to minimize disruptions and uphold operational stability.

Table 7 summarizes valuable insights across various focus areas identified in the current status analysis were suggested by stakeholders. For instance, in addressing the elimination of waste in the delivery queue, stakeholders emphasized the importance of leveraging technology and lean principles, as supported by the literature's emphasis on process optimization. Their suggestion to implement Robotic Process Automation (RPA) aligns with this, aiming to streamline processes and reduce inefficiencies in workflow.

Regarding the clarification of open orders, stakeholders stressed the literature's emphasis on continuous improvement by proposing enhancements to the clarity of textual information. This recommendation aligns with the focus on refining operations and ensuring clarity in processes.

In addition, the stakeholders emphasized the need for proactive measures in the management of delivery disruptions, which reflects the literature's emphasis on the role of technology in mitigating risks. Their proposal for preparedness to deal with failures, including technological improvements and preventive measures, emphasizes the importance of technological improvements and contingency planning, as noted in CSA and the literature.

Overall, stakeholders' suggestions closely align with the key focus areas identified in the CSA and draw upon insights from the literature and conceptual framework. By incorporating these recommendations into the proposal-building process, the aim is to address identified challenges effectively and achieve organizational objectives

5.3 Initial Proposal

The Proposal consists of three sections that deal with different aspects and functions in the organization. Each section presents clear and reasoned proposals designed to improve the performance of Ring deliveries and achieve the set goals. The purpose is to

provide the organization with practical guidelines that should enable it to develop its operations and succeed in a competitive business environment. The proposals were developed taking into account the organization's needs, resources and current situation.

5.3.1 Proposal Element 1: Eliminating unnecessary work

The eliminate unnecessary work proposal focuses on developing and enhancing the organization's automation processes while avoiding duplicate tasks and unnecessary work. This proposal is grounded in the thorough analysis of historical data presented in chapter 3.3.1, which highlighted both the successes of current automation practices and areas that need improvement. This proposal emphasizes the importance of continuous monitoring and optimization of automation processes.

> *“Unnecessary or duplicate tickets can be easily removed with RPA quite as these types of tickets are recognizable.” (Respondent 22)*

A key observation in the current state is the consistency of tickets produced by automation, which indicates potential waste. To solve this problem, it is proposed to introduce an automatic ticket acknowledgment system that identifies unnecessary tickets in all automation processes. This initiative aims to eliminate unnecessary work, streamline workflows and improve customer service, making more efficient use of resources.

In addition, the proposal recommends investments in advanced automation technologies, such as robotic process automation (RPA), and related scoreboards to achieve operational readiness. By leveraging these technologies, an organization can direct human resources to strategic and value-adding activities.

The amount of waste can be identified and accurately allocated to orders needed and identified as wasted work, as relevant work can be easily identified thanks to the text-based approach to tickets and orders. Based on this, a comparative analysis can be made between the baseline reference in section 3.3.1 and the initial proposal. This will make it possible to demonstrate the impact of the proposed changes of the proposal for unnecessary work elimination. This baseline reference data is used as a reference in the following Figures 13, 14 and 15.

“About 25% of the working time is spent on work from the job queue.” (Respondent 23)

“That's a pretty good estimate of working time on the job queue.” (Respondent 24)

According to an estimate received from stakeholders, it can be assumed that 25% of the working time will be spent on these tasks, i.e. a maximum of 10 from 40 full-time hours of weekly time per employee. Based on this initial data, the proposed effects can begin to be interpreted.

The Proposal emphasizes continuous monitoring and optimization of automation processes as key parts of the proposal.

Figure 14. Estimated calculations of removed waste work percentages.

Figure 14 illustrates the estimated removed waste work as the possible reduction of manual tasks and the associated time savings of the introduction of automation efficiency measures. It highlights areas where automation can significantly minimize wasted work and resources, contributing to overall process optimization.

The eliminate unnecessary work proposal seeks to exploit the full potential of automation technologies. This proposal first follows the application of Lean principles, which have already been used to eliminate waste, optimize processes and lay the groundwork for continuous improvement. By integrating automation into the workflow, an organization can further streamline its delivery processes. The weekly impact of automation is estimated to be 17–34 percent, and the benefits achieved in working hours are 1.7–3.4 hours per employee.

5.3.2 Proposal Element 2: Improving Open Orders

The proposal for improving the management of open orders aims at the processing of orders written freely without a predetermined order coupon.

> *"OmaElisa's open order coupon can be changed and edited. This could provide clearer and better instructions for placing an order." (Respondent 25)*

> *“The open order request should also contain information that open orders are, as a rule, billable work. This might tackle some of unnecessary investigative work or orders” (Respondent 26)*

As a stakeholder suggests, one of the main goals of this proposal is to create clearer instructions for placing open orders. The goal is to minimize the risk of misuse and incorrectly placed orders and thus also minimize unnecessary clearing work. There should also be a clear indication of the possibility of invoicing.

By enhancing order coupon clarity and ensuring that each order is properly created, an organization can streamline operations and improve overall efficiency.

To assess the potential impact of the proposal on the identified tickets and open orders, the following figures and calculations have been made using baseline reference data.

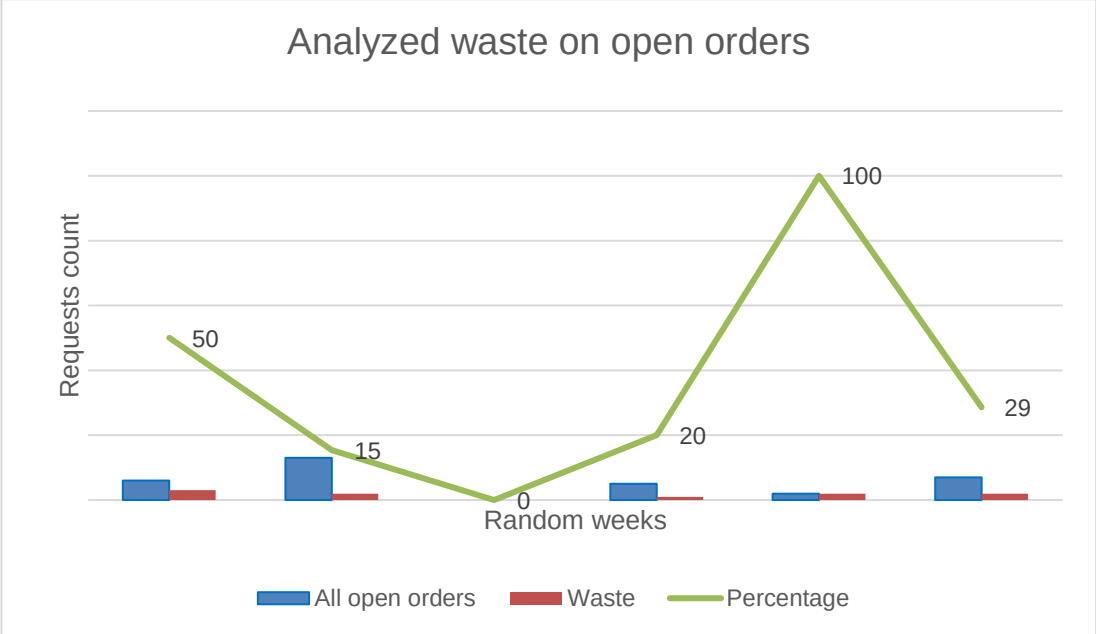

Figure 15. Analyzed waste with open orders.

Figure 15 shows the waste work and incorrect orders associated with the open order base. When these wasteful jobs can be minimized, it positively affects the situation shown in Figure 14 above. In other words, by reducing wasted work and incorrect orders, efficiency and productivity are improved, which can be seen as an added positive development of the situation shown in below Figure 16.

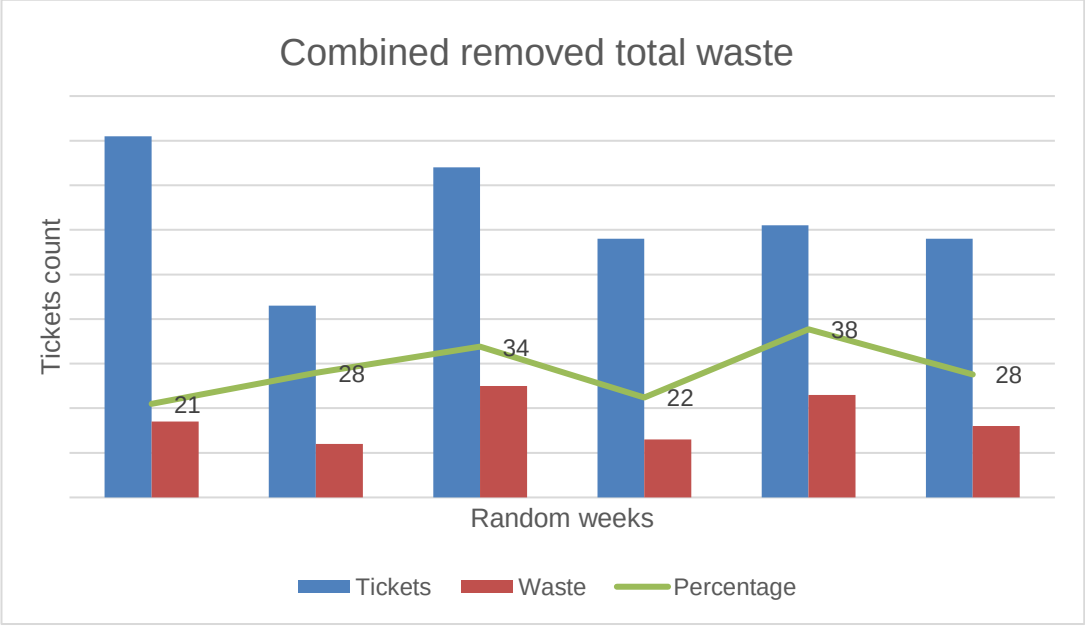

Figure 16. Combined removed total waste.

Figure 16 above shows the combined effect of eliminating unnecessary work by improving automation and also by improving open orders against baseline reference data. Most important effects are seen as percentages.

The proposal to improve the management of open orders stands for a strategic approach to solving the challenges related to processing open orders. With clearer guidance and using existing processes, the case company can improve its ability to manage open orders effectively and efficiently. This strategic initiative aligns with the principles discussed in Howcroft and Taylor's (2022:357) analysis of automation and technology, which underscores the importance of addressing inefficiencies within organizational processes and improving the efficiency of capitalist production by reducing resources and costs.

By focusing on streamlining automation processes in 5.3.1, the organization strives to identify and eliminate unnecessary manual tasks. The aim is to optimize resource allocation and improve overall workflow efficiency with multiple protocols, since not only one makes a solution. Correspondingly, the proposal for improving the management of open orders in Section 5.3.2 aims to minimize wasted effort associated with incorrect orders and inefficient processing procedures by enhancing the clarity of order instructions.

The Social Shaping of Technology (SST) perspective reveals the complexity of technological development as well as challenges in the popular perception that new technologies alone will change the world of work. Quantitative predictions of the impact of automation are often incomplete because they do not consider human and social factors, uncertainties, or the importance of context (Howcroft and Taylor, 2022:364).

As shown in Figure 16, the synergistic combined effect of these proposals will eliminate unnecessary work on random weeks from 21% up to 38%. This is a reduction in the number of tickets and time is freed up as resources for other work that produces more customer satisfaction.

By implementing these proposals in parallel, the case company can effectively optimize its operating processes, minimize inefficiencies and continuously improve its service offering and customer satisfaction towards excellence.

5.3.3 Proposal Element 3: Improving System failure management

This Proposal contains suggestions for correcting and managing system errors in the case company of Ring delivery process. The proposal builds on the insights gained from the analysis of the current situation and integrates? best practices and theoretical frameworks for developing practical recommendations for more efficient system failure management.

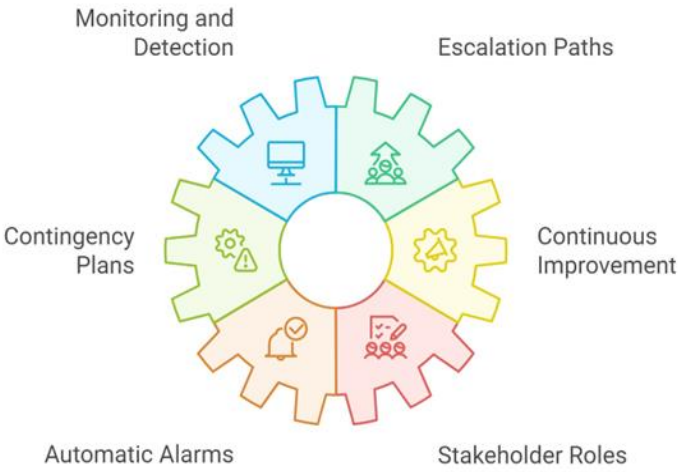

Figure 17. Picture for a contingency plan.

As seen in Figure 17, the proposal focuses on improving monitoring and detection mechanisms to identify system failures quickly and instantaneously. It also emphasizes creating clear escalation paths and protocols for effective issue resolution. In addition, the proposal allows for the preparation of contingency plans to reduce the impact of system failures on service delivery. In addition, it encourages the creation of a culture of continuous improvement through automation so that employees receive the necessary information to effectively fix system failures.

It may also be necessary to redefine stakeholder roles and responsibilities concerning this process to ensure that the right individuals are notified about the alarm and can act promptly. This may include revising the existing communication protocols and updating the list of stakeholders to account for any changes in responsibilities or personnel. Such improvements aim to optimize response times and ensure effective issue resolution.

“There can be alarm when tickets number increase over the threshold. System can also be paused to identify problem on workflow.” (Respondent 27)

Also, a necessary and important option would be to implement some kind of automatic alarm when tickets appear in the job queue exceptionally quickly. The limit value can be derived from the results obtained from historical analysis either by agreement or by estimation. The limit value would be easily set by new values if needed. If the limit value is exceeded, an alert could also be sent via the mobile interface to important stakeholders, so that the information could be utilized as quickly as possible. The system could also have a pause method that prevents new orders until the problem is resolved. This pause method could work in such a way that the system stops and prevents orders from being placed until someone has cleared the alarm.

“Alarm can be also sent via mobile when failure is noticed.” (Respondent 28)

Alternatively, or in addition, as the stakeholder emphasizes firm could use the mobile pager alarm, which sends an alarm directly to a cell phone, ensuring that the information about the disturbance reaches the key personnel as quickly and efficiently as possible.

This automation is crucial for addressing potential risks identified in Section 5.3.1, where the system acknowledges tickets that may be erroneous or unnecessary. In Section 5.3.3, the issue arises when the system fails to distinguish between orders accurately, leading to all orders being classified as erroneous. This stresses the importance of implementing effective automation and failure management practices to ensure accurate order processing and minimize the risk of generating erroneous tickets.

With both proposed procedures, case company Ring delivery can streamline operations, reduce unnecessary manual monitoring of the work queue and free up resources for other tasks. This approach improves the company's ability to proactively identify system malfunctions and react to them quickly, minimize disruptions and ensure consistently higher customer satisfaction.

The final section is contingency plan updates. It’s necessary to maintain plans and update iteratively when new features or versions become available.

5.4 Summary of the Initial Proposal

Table 8 shows the proposal elements to optimize operational processes, reduce costs and improve customer satisfaction.

Table 8. Summary of the proposal elements.

Element	**Description**
Eliminate unnecessary work	Focuses on optimizing automation processes to reduce manual work and enhance efficiency.
Clarify open orders	Propose clarification to open order coupons for improved order processing.
Improve System failure management	Suggests improvements to system failures to ensure prompt resolution and minimal disruption.

The first proposal element focuses on *eliminating unnecessary work* by streamlining the automation processes, reducing manual work and increasing efficiency. By automating repetitive tasks, the organization can improve productivity and allocate resources more efficiently, leading to significant operational improvements.

The second proposal element concerns the *clarification of open orders*, intending to improve the accuracy and efficiency of order processing. By refining the processing of open order coupons, the organization can reduce handling and order errors and speed up delivery, reducing the Ring delivery team's workload.

The third proposal element concerns improving the *management of system failures*. This proposal includes the introduction of advanced monitoring techniques to proactively identify potential system failures and address them before they lead to significant disruptions. This proposal also includes the implementation of rapid resolution strategies to minimize disruptions and the possibility of efficient recovery from system failures. Effective system failure management is critical to maintaining business continuity and reliability, ultimately contributing to smoother and more reliable service to customers.

Taken together, these suggestions should improve the organization’s overall efficiency and effectiveness. By focusing on automation, streamlining the ordering processes, and improving system failure management, the organization can also achieve better resource management and reduce unnecessary costs. By optimizing automation processes,

monitoring system errors and managing open orders, the organization can get significant benefits such as cost savings, improved service quality and improved customer satisfaction.

The next section 6 focuses on the validation of proposals. This section assesses the feasibility and practicality of the proposals when applied under real-world conditions, as far as can be determined at this stage of the study. The aim is to assess actual and potential impacts.

6 Validation of the Proposal

This section presents the results of validation, i.e. the conclusions obtained to assess the feasibility of the initial proposal.

6.1 Overview of the Validation Stage

In circumstances where testing and large-scale piloting may not be possible, the validation phase is highly dependent on accumulated experience and comprehensive knowledge. Validation is more than just testing and piloting; It requires the use of expertise and in-depth empirical understanding to ensure that the proposed solutions are aligned with project objectives and meet the required standards.

The validation process, based on experimental insights and robust data, aims to confirm the viability and efficiency of the proposed solutions, drawing on the know-how of stakeholders. At this stage, designs and processes pose unique challenges that require careful attention and specialized knowledge. Every aspect of the validation process is guided by careful familiarization and years of solid experience, as well as an in-depth understanding of the subject. Furthermore, it must be recognized that validation goes beyond simple solution validation; It also covers the validation of assumptions, methods and basic principles. This holistic approach ensures that the proposed solutions not only meet the technical requirements but are also in line with the wider objectives of the project and the expectations of stakeholders.

In this study, the validation phase consisted of collected meetings and stakeholders' perspectives. The stakeholder feedback actively collected through interviews, daily collaborations and discussions helped to gain valuable information on the effectiveness of the proposed measures. Some areas for improvement were also identified during the validation proposal phase.

The meeting insights collected during the validation proposal phase were analyzed to identify concerns. Based on the proposed actions and actions, the analysis helped to define suitable and better monitored performance indicators for the measures. The original proposal was further developed based on the feedback received and the results of the data analysis. The refining process, which consisted of iterative phases, focused on correcting development areas identified during discussions and analyses.

At the end, a final proposal was formulated, including feedback from the meetings in alignment with the process. Drawing on insights from the literature, as well as feedback and perspectives from stakeholders, a comprehensive proposal was developed to achieve the processes and strategic objectives. In addition to presenting a proposal, implementation recommendations and plans for future actions were outlined. These are intended to guide the organization in the successful implementation of measures.

Selection and consideration of stakeholder feedback ensure that the proposed measures do not create conflicts or redundancies, ensuring alignment with the organization's strategy.

6.2 Developments to the Initial Proposal

Section 6.2 discusses the developments of the original proposal based on the feedback collected in Data Collection 3 and the comments provided by the stakeholders. Each development area is divided into sub-headings and through these sections suggestions for improvement and changes made to the original proposal in response to feedback and observations are documented. The goal is to present an updated proposal that fully takes into account the comments of stakeholders and that fulfills the project goals.

6.2.1 Developments to Element 1: Eliminating Unnecessary Work

In this subsection, detailed improvements were made to eliminate unnecessary work by the automating streamlined proposal based on stakeholder feedback and suggestions.

> *"Automation system also has a dashboard to monitor the queue in real time." (Respondent 29)*

Stakeholders suggest a dashboard to monitor the queue in real time. Although this does not directly eliminate waste, but can seeing the situation accurately can help to monitor the situation in visual form. The dashboard also has a better monitoring option for potential stakeholders.

The table below summarizes the inputs from stakeholders about the automation streamlining proposal.

Table 9. Stakeholder suggestions for the Initial proposal of automation streamlining.

Element of Initial Proposal	**Parts Commented in Validation**	**Description of Comments/Feedback by stakeholders**	**Development to Initial Proposal**
Automation Process	Streamlining Process Flow	Stakeholders suggested simplifying the process flow with RPA to remove waste and improve efficiency.	Simplified process flow to remove waste with RPA and RPA dashboard to view process flow.

As seen from Table 9, the feedback from stakeholders emphasized the need to simplify the automation process via removing waste with RPA from workflow to enhance efficiency and a dashboard to view process flow. Consequently, the initial proposal was revised to incorporate these suggestions, resulting in a more streamlined, visually effective and more efficient process.

RPA could easily be used to handle tickets that are primarily in textual form, focusing on tasks that require unnecessary checkouts. Over the years, the synergy between automation, OmaElisa and manual checks has improved, allowing for the reduction of review steps in many cases. This improvement has been validated through continuous monitoring of order processes formed in the work management system.

6.2.2 Developments to Element 2: Clarifying Open orders

This subsection outlines the improvements made to the open order improvement proposal based on feedback from stakeholders. The table below summarizes the inputs received.

Table 10. Stakeholder suggestions for the clarification of open orders coupon.

Element of Initial Proposal	**Parts Commented in Validation**	**Description of Comments/Feedback by stakeholders**	**Development to Initial Proposal**
Clarification of open orders coupon	Clarity of Order Instructions on coupon	Stakeholders recommended clarifying order instructions to reduce orders that do not belong workflow of the Ring delivery team.	Revised order instructions to offer clearer guidance for order processing.

As shown in Table 10, the stakeholder's feedback emphasized the importance of clarifying the order instructions to make the processing of orders more efficient and to eliminate unnecessary clearing work. Accordingly, the initial proposal was revised to provide clearer guidance, thereby addressing this feedback.

6.2.3 Developments to Element 3: Improving System Failure Management Proposal

This section discusses the improvements made to the system failure management proposal based on feedback from validation stakeholders. The table below summarizes the inputs received.

Table 11. System failure management suggestions.

Element of Initial Proposal	**Parts Commented in Validation**	**Description of Comments/Feedback by stakeholders**	**Development to Initial Proposal**
System Failure Management Implementation	Response Time to Failures	Stakeholders highlighted the need to improve response times to system failures to minimize disruptions.	A revised contingency plan that includes specific measures to reduce response times, such as automatic alerts with RPA pause procedures or mobile alarms.

As shown in Table 11, the feedback received from the stakeholders emphasized the importance of improving response times in case of system failures. For this reason, the original proposal was revised by including specific measures aimed at reducing response times and thus improving the overall operational reliability of the contingency plan.

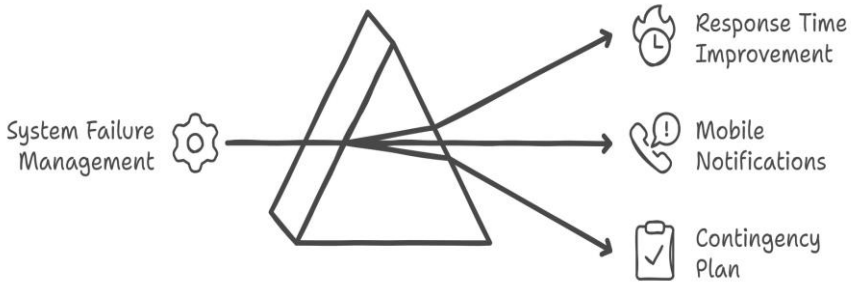

Figure 18. Combined system failure management.

As seen in Figure 18, one possibility for proposed paused/informative alarms based on threshold would be the enhancement of a mobile pager alarm, a kind of mobile

application that provides real-time notifications and alerts when threshold limits are exceeded.

> *“Mobile pager alarm can be shared with stakeholders so at least someone informs necessary stakeholders.” (Respondent 30)*

Emphasized solution offers an additional layer of automation by allowing stakeholders to monitor critical processes directly from their mobile devices. Incorporating the mobile pager alarm, the revised proposal not only simplifies the workflow through RPA but also empowers users with instant access to process performance data, ensuring quicker response times and more effective decision-making. People who would be informed via mobile application would be critical stakeholders involved in the procedure.

When any of these stakeholders receive an alarm notification, they can promptly communicate the issue to relevant parties and initiate corrective actions without delay. However, this process requires the support of a well-defined contingency plan. The plan illustrated above would allow for a temporary suspension or pause of the system, as well as an informative approach to ensure a complete picture of the situation among stakeholders until the problem is fully resolved. That precautionary measure will allow potential disruptions to be managed more effectively and reduce the risk of significant operational impacts.

This comprehensive system failure management proposal would enhance preparedness for potential unexpected disruptions and help minimize their impact on operations.

6.2.4 Related Calculations

Based on the available baseline reference data of Section 3.3.1 and benchmarked analysis, this section aims to calculate as accurately as possible the time and cost benefits that can be achieved by removing unnecessary work.

Table 12. Metric and assumptions table.

Metric	Value / Assumption
Total weekly work hours	40 hours

Percentage of time on Delivery queue work	25 % (10 hours)
Estimated reduction in workload	21–38 %
Weekly hours saved per employee	2.1 hours (21 %) - 3.8 hours (38 %)
52 weeks saved per employee	109.2 hours (21 %) - 197.6 hours (38 %)
Average hourly wage	€ 25
52-week savings per employee	€2730 (21 %) - €4940 (38 %)

Table 12 presents the key terms in an easily accessible consolidated format. The data and approach in the table are based on stakeholders' previously established views. The assumed hourly wage used in the calculations is hypothetical and does not reflect actual wages, but it provides a solid perspective on performance.

When large-scale real-life piloting is not possible, this thesis has instead concluded a theory-based benchmark against the baseline reference data obtained in Section 3.3.1. The theoretical effect on the reference data is done by eliminating waste and improving open orders as observed in Figure 16, Section 5.3.2 by theoretically removing the tickets and orders from the queue that the methods developed in the thesis would have targeted if large-scale piloting had been carried out.

The results can be considered very realistic, as the textual form of tickets and orders is recognizable. The impacts have been examined with stakeholders, and the views have supported each other.

The overall impact is calculated using the baseline reference data obtained earlier and providing a theoretical and computational benefit to these figures based on the final

impact of eliminating unnecessary work and streamlining delivery processes for the Ring services.

The previously mentioned 25% of the weekly time is allocated to the work of the Ring Delivery queue based on the views of stakeholders, and thus 25% of the 40-hour weekly working time is 10 hours.

A minimum effect reduction of 21% would save each employee approximately 2.1 hours per week, for a total of 109.2 hours in 52 weeks. With an average hourly wage of €25, the savings would be around €2730 per employee in 52 weeks.

A maximum effect reduction of 38% would save approximately 3.8 hours per employee per week, or a total of 197.6 hours in 52 weeks, resulting in estimated savings of €4940 per 52 per expert.

An organization can achieve strategic benefits by allocating these resources freed up from repetitive and automation-enabled work towards more creativity and more customer-centric service-oriented work. This is also likely to have a significant impact on customer satisfaction as well as the satisfaction of employees.

6.2.5 Open Order Improvements and small-scale implementation

Improvements were made to open orders as stakeholders suggested. The order coupon was revised to be more accurate, user-friendly, and informative. Additionally, to address unclear orders, further guidance was incorporated into the open order for topics that were identified as ambiguous. According to feedback received from stakeholders, the change corrected some ambiguities and promoted open orders in a better direction. However, it is acknowledged that large-scale implementation and auditing were not considered necessary at this stage, but the change was implemented directly based on stakeholder views in a more precise direction. Information was communicated on a small scale without the need for a more extensive audit in a change of this scale. It should also be noted that the implemented change has not yet been in effect for a long time, so its effects may not accumulate until later. Based on a random 1-1 survey conducted for stakeholders, no attention has been paid to the change, and to conclude from this, changes always require communication and an informative approach, which was not yet done in this quick implementation phase.

6.3 Final Proposal

The final proposal aims to improve operational efficiency and reliability through a holistic approach. Fundamental to this effort is the integration of two important elements after the implementation of Lean principles: improving automation and managing system failures that affect the potential workload of Ring delivery processes. Improving automation is a key part of our strategy, which focuses on the opportunity to implement a Robotic Process Automation (RPA) solution by removing the load caused by unnecessary tasks. Eliminating manual operations and reducing inefficiencies with RPA contributes to a smoother and more efficient workflow. This not only reduces the possibility of manual errors but also contributes to improving the predictability of operations. This, in turn, enables better allocation of resources to work that generates customer service.

Automation work is complemented by a strong system failure management strategy, the purpose of which is to ensure quick and efficient response to disruptions. The automatic alarm system and predefined RPA pause method aim to minimize the impact of system failures and speed up the return to normal operation. This proactive approach to fault management emphasizes a commitment to resilience.

Clarifying open orders is important when optimizing your workflow. When open assignments are defined as accurately as possible at the ordering stage, ambiguities can be minimized and this in turn reduces the work leading to the investigation. This approach increases operational clarity and resource utilization, which reinforces the effectiveness of our proposed framework.

Figure 19. Summary diagram.

Figure 19 shows the final summary of the proposal represents a comprehensive effort to enhance operational efficiency and reliability. It integrates key components such as

process optimization, cost reduction, customer satisfaction, resource management, and continuous improvement.

Optimization focuses on streamlining workflows to enhance operational efficiency. By applying Lean principles and automation, the aim is to simplify processes, reduce manual processes, and increase productivity. This broad approach addresses overall workflow effectiveness.

Reduction specifically removes unnecessary work. By identifying inefficiencies and implementing cost-effective solutions, the aim is to optimize resource use and reduce both waste and costs, which are critical aspects of improving operational performance.

Satisfaction Employees' intrinsic motivation increases when they feel committed to their work tasks and perform a variety of tasks. The introduction of more qualitative tasks and the reduction of repetitive tasks seem to be effective ways to boost employee motivation. However, certain employees may not experience heightened motivation when assigned challenging tasks. Even in this case, according to the study, switching from repetitive tasks to other tasks significantly improves employee motivation (Raso and Olsson, 2019:42).

Resource Management emphasizes the effective allocation of resources to maximize output and operational effectiveness. The proposal aims to utilize resources efficiently to support both strategic objectives and successful project delivery.

Continuous Improvement supports a culture of ongoing refinement as well as auditing. Regular reviews and updates are planned to maintain process effectiveness and adapt to evolving challenges. Case company has already been awarded in 2021 in the EFQM (European Foundation for Quality) Global Awards for its long-term commitment to this quality work (Elisa Oyj, 2021).

In summary, the final proposal integrates automation improvements, effective cost-reduction strategies, and a customer-centric approach to create a robust foundation for operational excellence and sustained success.

6.4 Recommendations

For ongoing, future and continuous development, it is important to take advantage of the diverse and valuable roles of the team and stakeholders, which guarantees everyone's active participation in continuous improvement. Each team member brings a unique set of skills and perspectives to the table, making their contribution essential to the progress of the project.

First and foremost, creating a separate development role within the team could greatly facilitate the coordination and promotion of improvements in ongoing delivery change projects. This role includes responsibilities such as overseeing improvement initiatives, analyzing feedback, and implementing changes. Success can be measured by monitoring the number of initiatives taken and the satisfaction of stakeholders.

Second, stakeholder engagement can be enhanced and achieved through regular feedback sessions and workshops. Scheduled quarterly meetings where stakeholders present suggestions for improvement, share ideas and gather feedback from personnel. The effectiveness of sessions is evaluated by tracking the percentage of feedback that leads to changes in the process or workflow to be implemented or actions that advance the workflow.

Third, Key Performance Indicators (KPIs) to monitor process efficiency, error rates, and system availability are essential. Conducting regular evaluations and utilizing tools such as dashboards and automation-based performance monitoring indicators. Decisions will be made either based on data analysis or by tracking key indicators. Success can be measured by following the trend that follows performance and conducting half-yearly evaluations.

In summary, fostering a culture of continuous improvement is paramount. This can be achieved through open communication and recognition, as well as through proven initiatives. By adopting these recommendations, the project can ensure the active commitment of all stakeholders and effectively promote the case company's culture of continuous improvement.

7 Conclusion

This section includes an executive summary of the thesis, followed by a discussion of the managerial implications and a review of the results. Finally, concluding remarks wrap up the study.

7.1 Executive Summary

This study aimed to develop an efficient delivery process for Ring services, with a particular focus on eliminating waste generated on the Ring delivery queue and thus significantly shorten delivery times. Cloud-based telecommunications is undergoing a major transformation, and Ring delivery services play a role in this context as well. Their efficient delivery process is strategically important for the company's competitiveness and customer satisfaction.

The study was carried out using a five-stage methodology, which started with setting the objective and included an analysis of the current state (CSA), the development of a conceptual framework, and the preparation and validation of a proposal. In the analysis of the current situation, the delivery process of the Ring delivery services was examined together with stakeholders, and challenges and necessary improvements were identified. With the help of CSA, the development areas were identified to optimize delivery tasks and to clarify transparent background information on orders. The demand to improve the flexibility and reliability of the automation system was also identified.

The conceptual framework was developed based on the literature review that was later utilized in the development work. Suggestions derived from literature provided a basis for developing the solutions and addressing the problems identified.

In the development phase, the proposals were co-created with the help of stakeholders, and the focus was on practical solutions tailored to the case company’s specific needs. Before the proposal was developed, the Conceptual framework was creatively reflected upon and adjusted in cooperation with stakeholders, to fit to the perspective provided by the case company. The proposal included developing an efficient delivery process that should significantly reduce unnecessary work and improve the availability and quality of the case company’s Ring services.

In the validation phase, the proposal was discussed with the relevant stakeholders, and the feedback received was incorporated into the final proposal.

Developing an efficient delivery process for the Ring services is an essential step in strengthening the case company’s competitiveness and improving customer satisfaction. It is essential for improving the company's performance and competitiveness that an efficient delivery process can significantly increase.

7.2 Managerial Implications

For the case company, implementing an efficient delivery process for the Ring delivery services requires a strategic approach and careful consideration of different stakeholders. Here are several steps that the management can consider to follow.

First, the importance and benefits of optimizing the delivery process proposed in this study need to be communicated to all stakeholders in the organization. This means ensuring that employees understand the reasons for the proposed changes and how they align with the company's strategic short- and long-term goals.

Second, a multidisciplinary and multi-stakeholder team needs to be established that is motivated to monitor and further develop the delivery process. The group should be composed of representatives of the different stakeholders involved in the provision of services. Collaboration and clear communication, as well as the implementation of information between team members and stakeholders, are essential for successful implementation.

Third, the effectiveness of the implemented changes needs to be systematically monitored and evaluated. In addition to data-driven management, regular development discussions and workshops would be suitable for this. However, it must be noted that the customer base has been strongly trending, so this must be interpreted from the data.

Fourth, promoting a culture of continuous improvement in the organization is still necessary to maintain the most optimal delivery process possible. Continuous improvement and efficiency can be promoted by encouraging employees to identify, and suggest further improvements to the process and implement a feedback system based on suggestions for improvement.

In conclusion, the implementation of the proposed efficient delivery process of the Ring services will continue to require proactive leadership, effective communication, cross-functional cooperation, continuous monitoring and commitment to continuous improvement. By monitoring these impacts and knowledge-based management, case company can successfully implement the proposed changes in practice and realize the cost benefits and impacts of the improved operations.

7.3 Thesis Evaluation

The objective of the thesis was to develop an efficient process for Elisa Ring Delivery services, with a focus on reducing delivery times by eliminating unnecessary tasks. This objective was reached by conducting an analysis of the current state of delivery workflow, developing a conceptual framework, and developing the improvement proposal informed by industry insights and internal knowledge, with practical solutions tailored to the specific needs of the case company, and finally validating this proposal.

In assessing the quality of this work, it is important to acknowledge both strengths and limitations. One strength of the thesis is its practical approach, which included rigorous data collection, analysis, proposal development and validation. The five-step research design provided a structured framework for conducting the study and ensured that all relevant aspects of the delivery process were considered.

However, some areas could have been improved or at least expanded. One limitation is the reliance on internal knowledge, available data and industry insights in developing the conceptual framework. Although these sources offered valuable insights, a broader review of the scientific literature could have enriched the theoretical basis of the study and offered additional insights into the optimization of the delivery process, but the challenge was also the confidentiality of the subject, so the literature could not provide all the help.

In addition, the validation of the proposed solutions could have been more robust. Although the validation and testing phases are mentioned in the thesis, there is limited evidence from validation and specific feedback obtained. A more rigorous validation phase, including pilot testing or simulation exercises, could have provided stronger evidence of the effectiveness of the proposed solutions.

Overall, although the thesis stands for an effort to achieve the objective, there are areas where improvements could have been made to improve the depth and reliability of the results. So, the readers should be critical and open to concerning both the process and the results, and future studies are needed. By recognizing both strengths and limitations, the researcher can ensure a mindset of continuous learning and improvement, which ultimately contributes to the development of knowledge and practice in the field.

7.4 Closing Words

When I have come to the end of this thesis, it is a moment for both satisfaction and reflection. This thesis has been a careful study of the optimization of the delivery process of Elisa Ring services guided by experiential learning. Yet, when progress is celebrated, there's always room for growth. At the end of the study, I want to recognize the effort made and also the areas for improvement, and embrace the academic ethos of rigor and continuous improvement. Let this thesis be both the ground for further research and an inspiration for future research work.

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AI statement 1

ATTACHMENT to the Master´s Thesis

WRITTEN STATEMENT
on the use of AI-based tools in this thesis

by Harri Niemikari, the student of BI Master´s Degree Programme

Thesis title: Streamlining delivery processes for Elisa Ring services

According to the *"Guidance for addressing the use of AI-based tools in studies at Metropolia Business School (for written submissions)"* from August 2023, I make this statement on the use of AI-based tools in my submitted Master´s thesis.

1) Which AI-bases large language models or other AI-based tools I used

Napkin.AI and chatgpt

2) In which parts of the thesis which tools were used, and for which tasks *(please make a list)*
Napkin.ai for graphic outcome. Chatgpt to formulate correct translation and better text outcome.

3) What portion of the text was helped with these tools, for each use
The tools were used to enhance the readability of the text and refine its formulation, but all original ideas, analyses, and research content are my own.

4) Which prompts were asked, exactly *(please indicate the page number in the text where used)*
How to say this better?

5) Here, I describe what continues an ethical and reliable use of AI-based tools that I used *(use, for example, the recommended documents from "MBS Guidance" referred to above)*
I used AI to check for better text formulation and the correctness of words, but I always ensured that the content and analyses were my work.

6) Here, I describe how ethically and reliably I used the AI-based tools in my thesis submission

I made sure that the AI-based tools were only used to support my writing and presentation without replacing any thinking or research elements. I used them for tasks like enhancing text readability and generating visuals, while ensuring that the core ideas were mine.

This written statement makes part of my thesis and is done to help in evaluation and assessment.

21.10.2024 HELSINKI

(Data and place)

Harri Niemikari

(Signature)

Harri Niemikari