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Optimizing Operative Purchasing Processes within Indirect Procurement - Cost Efficiency and Strategic Value

Wärtsilä Oyj

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Abstract

This bachelor's thesis focused on optimizing Operative Purchasing (OP) processes within Indirect Procurement (IP) at Wärtsilä, with an emphasis on cost efficiency and strategic value through digitalization. The aim of the research was to identify the key digital tools used in OP, understand how they contribute to optimizing procurement processes, and explore the challenges involved in implementing these tools.

The research was conducted through qualitative methods, primarily involving interviews with four participants from the OP team in Finland. The participants were selected based on their experience and role in the OP process, and their insights were analyzed to understand the impact of tools like WeBuy, SAP, and Robotic Process Automation (RPA) on procurement efficiency and value creation.

The results revealed that digital tools, particularly WeBuy and SAP, have significantly streamlined processes, improved supplier relationships, and enhanced decision-making. However, challenges such as resistance to change, integration issues, and the continued use of traditional tools were also identified. The thesis concluded with recommendations to improve user training, further integrate digital tools, and embrace continuous improvement frameworks to maximize the potential of digitalization in OP.

Language: English
Key Words: operative purchasing, indirect procurement, cost efficiency, strategic value, digitalization

EXAMENSARBETE

Författare: Emil Marjamäki
Utbildning och ort: Företagsekonomi, Vasa
Inriktning: Internationell handel
Handledare: Biniam Tefera, Polina Poklad

Titel: Optimering av operativa inköpsprocesser inom indirekt upphandling - Kostnadseffektivitet och strategiskt värde

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Datum 5.12.2024 Sidantal 57 Bilagor 1

Abstrakt

Detta examensarbete fokuserade på att optimera Operativa Inköpsprocesser (OP) inom Indirekt Inköp (IP) på Wärtsilä, med ett särskilt fokus på kostnadseffektivitet och strategiskt värde genom digitalisering. Syftet med forskningen var att identifiera de nyckelverktyg som används inom OP, förstå hur dessa bidrar till att optimera inköpsprocesserna och utforska de utmaningar som uppstår vid implementering av dessa verktyg.

Forskningsmetoden var kvalitativ och bestod huvudsakligen av intervjuer med fyra deltagare från OP-teamet i Finland. Deltagarna valdes ut baserat på deras erfarenhet och roll i OP-processen, och deras insikter analyserades för att förstå hur verktyg som WeBuy, SAP och Robotic Process Automation (RPA) påverkar inköpseffektivitet och värdeskapande.

Resultaten visade att digitala verktyg, särskilt WeBuy och SAP, har effektiviserat processer, förbättrat leverantörsrelationer och stärkt beslutsfattandet. Därtill identifierades också utmaningar som motstånd mot förändring, integrationsproblem och fortsatt användning av traditionella verktyg. Examensarbetet avslutas med rekommendationer för att förbättra användarutbildning, vidare integration av digitala verktyg och att omfamna kontinuerliga förbättringsramverk för att maximera digitaliseringens potential inom OP.

Språk: Engelska
Nyckelord: operativt inköp, indirekt upphandling, kostnadseffektivitet, strategiskt värde, digitalisering

OPINNÄYTETYÖ

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Päivämäärä 5.12.2024 Sivumäärä 57 Liitteet 1

Tiivistelmä

Tässä opinnäytetyössä keskityttiin operatiivisten hankintaprosessien (OP) optimointiin Wärtsilän epäsuorassa hankinnassa (IP) keskittyen kustannustehokkuuteen ja strategiseen arvoon digitalisaation avulla. Tutkimuksen tavoitteena oli tunnistaa tärkeimmät digitaaliset työkalut, joita käytetään OP-osastossa, ymmärtää niiden vaikutus hankintaprosessien optimointiin ja tutkia näiden työkalujen käyttöönoton haasteita.

Tutkimus toteutettiin kvalitatiivisin menetelmin, ja aineisto kerättiin pääasiassa haastatteluilla, joissa oli mukana neljä Wärtsilän OP-osaston jäsentä Suomesta. Haastatellut valittiin heidän kokemuksensa ja roolinsa perusteella OP-prosessissa, ja heidän näkemyksensä analysoitiin digitaalisten työkalujen, kuten WeBuy, SAP ja Robotic Process Automation (RPA), vaikutusten ymmärtämiseksi hankinta-aikojen ja arvon luomisen kannalta.

Tulokset osoittivat, että digitaaliset työkalut, erityisesti WeBuy ja SAP, ovat merkittävästi virtaviivaistaneet prosesseja, parantaneet toimittajasuhteita ja vahvistaneet päätöksentekoa. Haasteina tunnistettiin kuitenkin muutoksen vastustus, integraatio-ongelmat ja perinteisten työkalujen käyttö. Tutkielma päättyi suosituksiin käyttäjäkoulutuksen parantamiseksi, digitaalisten työkalujen syvemmäksi integroimiseksi ja jatkuvan parantamisen kehysmallien omaksumiseksi digitalisaation täyden potentiaalin hyödyntämiseksi OP-osastossa.

Kieli: Englanti
Avainsanat: operatiivinen osto, epäsuora hankinta, kustannustehokkuus, strateginen arvo, digitalisointi

Table of Contents

Abbreviations

IP	Indirect Procurement
OP	Operative Purchasing/Operative Purchasers
PO	Purchase Order
PR	Purchase Requisition
RFx	Request for X
RFQ	Request for Quotation/Request for Quotations
RFI	Request for Information
RFP	Request for Proposal
SP	Strategic Purchasing/Strategic Purchasers
ISO	International Organization for Standardization
SCM	Supply Chain Management
IT	Information Technology
ICT	Information Communication Technology
TCO	Total Cost of Ownership
PDCA	Plan-Do-Check-Act
QMS	Quality Management System
FMEA	Failure, Mode, Effect, and Analysis
GL	General Ledger
RPA	Robotic Process Automation
ERP	Enterprise Resource Planning
P2P	Procure-to-Pay
AI	Artificial Intelligence
MRBR	Manual Release of Blocked Invoices

List of Figures

List of Tables

1 Introduction

In today's rapidly changing business landscape, digitalization plays a significant role in driving transformation. It impacts almost all businesses and various organizational operations. One operation that has seen substantial impacts from digitalization is the Supply Chain Management (SCM). SCM and procurement are closely linked to managerial economics, as both fields apply economic principles to optimize decision-making within organizations. Managerial economics incorporates theories such as pricing, competition, demand, and cost -theory, all of which play a significant role in SCM and procurement strategies. These theories provide a foundation for understanding market dynamics, resource allocation, and operational efficiency, which are critical supply chain processes. (Wilkinson, 2022) Managerial economics is defined as administrative costs aroused when managing a company (Rutherford, 2013).

SCM can be organized into multiple departments and teams, depending on the company's structure. Within SCM, Indirect Procurement (IP) is commonly recognized as a specific department. At Wärtsilä, IP is an organization operating within SCM (Wärtsilä, 2024). A simpler way to conceptualize IP is as indirect purchasing, which involves acquiring goods and services not directly linked to the company's production process (Sollish & Semanik, 2012). IP is a crucial component of SCM, encompassing categories such as office supplies, marketing services, IT infrastructure, consulting services, and maintenance. As companies grow, they often need to redesign their procurement and supply processes, which involves task specialization. At Wärtsilä, the needs for IP are addressed by forming specialized teams that work toward common objectives. (Trent, 2007)

Wärtsilä is a global company in the energy and marine sectors, where IP plays a critical role in streamlining the organization's indirect needs. At Wärtsilä, the IP organization consists of a large, global team divided into two main departments: Operative Purchasing (OP) and Strategic Purchasing (SP). SP is responsible for strategic sourcing for critical suppliers, which includes evaluating and selecting suppliers for indirect goods and services. Both departments are tasked with building and maintaining supplier relationships, negotiating contracts, and creating supplier records within Wärtsilä's internal digital systems. SP also implements and utilizes e-procurement tools to streamline and enhance the efficiency of procurement processes. Meanwhile, OP's daily responsibilities include collaborating with stakeholders to apply various procurement processes and policies. This aspect of OP's operations will be discussed in more detail later in this study.

Modern procurement practices differ significantly from traditional methods of acquiring materials and services. Today's tasks are more diverse and include greater responsibility for analyzing supplier performance and managing purchases. (Monczka, Handfield, Giunipero, & Patterson, 2020) Digitalization provides purchasing departments with valuable insights into acquisitions, emphasizing cost efficiency and strategic value—both of which are critical components of the supply chain. As digital technologies continue to advance, new methods emerge to optimize procurement processes, resulting in improved efficiency, cost savings, and enhanced analytics. (Chopra & Meindl, 2016)

This thesis focuses on OP due to my previous work experience in the department at Wärtsilä. This experience has provided access to the necessary data for conducting the research and offers familiarity with the processes, thereby enhancing the potential for practical implementation. The research will examine digitalization and its role in optimizing IP processes within the OP department, with a focus on cost efficiency and strategic value. Specifically, it will analyze how tools such as e-procurement platforms, automation, data analytics, and process optimization contribute to cost efficiency. Additionally, the study will investigate how digitalization enhances supplier relationships, mitigates supplier risks, and improves decision-making within the OP organization.

Cost efficiency and strategic value are not only vital to OP but also serve as primary objectives for the entire IP organization. These goals are often key strategies for procurement organizations worldwide. This research aims to evaluate the effectiveness of these areas and identify best practices that could serve as a model for Operative Purchasing (OP) in Indirect Procurement (IP) at Wärtsilä.

1.1 Background

While pursuing studies in business administration at Novia University of Applied Sciences, the researcher began working as an Operative Purchaser in Indirect Procurement (IP) at Wärtsilä during the summer of 2023. After working full-time for four months, the researcher transitioned to an on-call trainee position, balancing this role with academic studies until May 2024. At that point, the researcher resumed full-time work as a trainee until September 2024, after which they returned to the on-call trainee role.

During their time at Wärtsilä, the researcher gained deeper knowledge of Operative Purchasing (OP), Indirect Procurement (IP), and their impact on the organization. They also acquired experience with several digital tools previously unfamiliar to them, including SAP,

an Enterprise Resource Planning (ERP) software recognized as a global leader in business operations solutions (SAP, 2024), and Wärtsilä's internal e-procurement system, WeBuy, among others.

When the researcher expressed an interest in writing a thesis on OP, they were given the opportunity to choose from several potential topics. They decided to focus on investigating the impact of digitalization on OP processes and exploring ways to further improve these processes.

1.2 Purpose

The purpose of this research is to gain a deeper understanding of the role digitalization and technology play in optimizing the OP processes in IP at Wärtsilä. By researching digital tools and e-platforms for their cost efficiency and strategic value. This research will also give a better understanding of how technological advancements are influencing strategic value in areas such as supplier decision-making, -relationships, -risk management and overall procurement strategies. Through analyzing these areas and with the results of this research, Wärtsilä might further improve strategic value and cost efficiency. This research will seek to investigate how OP is implementing technological changes and how benefits and challenges are being taken into consideration in optimization.

1.3 Research questions and objectives

The following research questions will be addressed in the study to achieve the objective:

- What main digital tools are being used by Wärtsilä to optimize operative purchasing processes, and how do they contribute to cost efficiency and strategic value?
- How might Wärtsilä further improve cost efficiency and strategic value in operative purchasing?
- What challenges does Wärtsilä face when implementing digital tools in operative purchasing, and how can these challenges be mitigated? Are there any traditional tools still being used, and if so, why?

These research questions will serve as the foundation of this study and will guide the investigation throughout both the theoretical and empirical parts of the research. The objective is to identify the main digital tools used for cost efficiency and strategic value at

Wärtsilä OP, while also exploring potential improvements in both areas. Additionally, the study will examine the challenges associated with implementing new digital tools in OP and explore possible solutions to these challenges. Finally, the research will investigate whether traditional tools are still in use and the rationale behind their continued use. By addressing these questions, the study aims to identify cost-efficient approaches in OP processes that can add strategic value.

1.4 Research Problem Definition

With the rapid advancement of digital technologies, including the expansion of computers and Artificial Intelligence (AI), concerns have emerged about their potential to displace human labor and reshape job markets (Batran, Erben, Schulz, & Sperf, 2017). This transformation directly impacts OP as technological advancements are driving new ways of conducting business. These changes demand a comprehensive understanding of data analytics, collaboration with third parties, and the ability to respond quickly to challenges. In all of these areas, digital technology is a driving force, improving traditional procurement processes through enhanced spending and category analysis, while also advancing new areas with sophisticated data analytics. (Batran et al., 2017)

Digital transformation is not essentially only about tools and technology. It is also crucial to be aware of the fact that digital transformation in procurement is strengthening the focus on customers and users, and also driving key changes in operational processes, ways of working, and collaboration. (Batran et al., 2017)

This is why analyzing the digital tools in terms of cost efficiency and strategic value is important for OP and how Wärtsilä can continue to improve in these areas. With technological changes come challenges, the question is how can these be effectively mitigated? In the following section scope limitations will be covered, and in Chapter 2 the literature review will begin.

1.5 Scope limitations

To keep the scope of the research manageable and due to access to internal analytics and information, this study will focus exclusively on Wärtsilä Finland. Given the extensive nature of the supply chain, which involves numerous stakeholders, certain limitations are necessary. Consequently, the research will concentrate on the OP department within IP at Wärtsilä. The study will explore how digitalization and technology contribute to optimizing

processes, with particular emphasis on cost efficiency and strategic value. While the daily tasks of the operative purchaser will only be briefly mentioned, they will be included only if deemed necessary for the context.

Digital tools and technology are crucial components of OP; however, to maintain focus, this study will specifically examine the role of digitalization and technology in achieving greater efficiency and strategic value in OP processes.

The IP organization consists of two departments: OP and SP. This research will focus solely on OP. Although SP will not be the focus of the study, the collaboration between OP and SP regarding procurement processes and policy improvements will be briefly discussed due to its relevance to the analysis.

Within OP, Wärtsilä has teams across various regions and countries, and a role known as the tactical purchaser. The tactical purchaser handles small- and mid-value spot buy negotiations, light sourcing, contract management support, and catalogue management (Wärtsilä, 2024). While tactical purchasing is part of OP, a detailed analysis of the tactical purchaser's tasks will not be included in this study. It is important to note, however, that OP analytics encompasses the tactical purchaser's savings and other metrics. The decision not to include an in-depth analysis of tactical purchasing stems from the role's recent introduction within Wärtsilä OP, its similarities to the operative purchaser role, and the limited available information on this role at present.

Information and Communication Technology (ICT) purchasing team is also a part of the global OP team. This team handles the procurement of software and IT tools, such as phones and computers. However, the ICT purchasing team's responsibilities will not be covered in this research. (Wärtsilä, 2024) In summary, this research will focus exclusively on the OP department within Wärtsilä Finland, analyzing the optimization of its processes with an emphasis on cost efficiency and strategic value.

2 Literature review

The literature review chapter will begin by examining the concept of indirect procurement. It will then analyze the digitalization processes and tools utilized in procurement, including e-procurement, Robotic Process Automation (RPA), and Enterprise Resource Planning (ERP). The theory selection will focus on the various roles of digitalization in processes, emphasizing cost efficiency and strategic value. Cost efficiency will be addressed in Chapter 2.3 and strategic value in Chapter 2.4, where these terms will be defined and their practical implications outlined.

This chapter will review standards such as the ISO 9001:2015 Quality Management Systems (QMS) (Chapter 2.5), an international standard that specifies requirements for a QMS (Dentch, 2016) Additionally, the risk management framework called Failure Mode and Effect Analysis (FMEA) will be explained in Chapter 2.6, a method valid when redesigning a process (American Society for Quality, 2024).

Furthermore, the literature review chapter will cover theories such as Total Cost of Ownership (TCO) (Chapter 2.7), a framework used to determine the complete cost of purchasing, owning, and using a product or service throughout its entire lifecycle. (Monczka et al., 2020) The chapter will also discuss Continuous Improvement (Chapter 2.8), a theory that includes Kaizen, a Japanese practice focused on continuous improvement. Kaizen is often associated with tools such as 5S, the PDCA Cycle, Lean, and Six Sigma, and it is a key concept in management. (Imai, 1997)

This literature review will provide a comprehensive understanding of the numerous digitalization tools and processes in procurement, focusing on their roles in achieving cost efficiency and strategic value. By examining standards, frameworks, and theories, this chapter will set the foundation for analyzing how digitalization can optimize OP processes within Wärtsilä Finland.

2.1 Indirect Procurement

When a company becomes globally established, creating a dedicated department to manage indirect spending often becomes essential. Such a department can generate substantial returns for the organization.

Indirect Procurement (IP) plays a crucial role within the supply chain (Payne, Dorn, Pastore, & Ulrich, 2021). IP manages the acquisition of goods and services that are not directly tied to the company's production process. These include categories such as office supplies, tools, marketing services, consultation services, maintenance, and more. These categories often represent significant expenditures for the company. The objectives of procurement have evolved beyond the traditional focus on achieving the lowest price. Modern procurement aims to achieve cost efficiency and deliver value to customers. (Monczka et al., 2020)

In practical terms, cost efficiency in IP means that a purchaser might select a product with a shorter delivery time and better quality, even if it is 3% more expensive. In this scenario, time is saved, and a superior product is obtained, which compensates for the higher price. This example highlights cost-effectiveness and adds value for the stakeholder. A more detailed discussion of cost efficiency will be provided in Chapter 2.3. (Monczka et al., 2020)

The growing reliance on outsourcing, consultants, and increasing cost pressures highlight the growing importance of effectively managing a department like IP. Within IP, it is essential to carry out various tasks to ensure satisfaction among internal customers, often referred to as stakeholders or end-users. While procurement has evolved, meeting customer needs has traditionally been, and continues to be, a core responsibility of the purchaser. (Monczka et al., 2020)

The role of procurement professionals is rapidly evolving in today's business landscape as technology introduces new methods and tools. To succeed, these professionals must respond effectively to current market trends while anticipating the future needs of the organization, including new technologies, methods, or systems. (Roßbach, 2022) One must be a master of change for the business to improve and keep up with the ever-evolving changes (Sollish & Semanik, 2012).

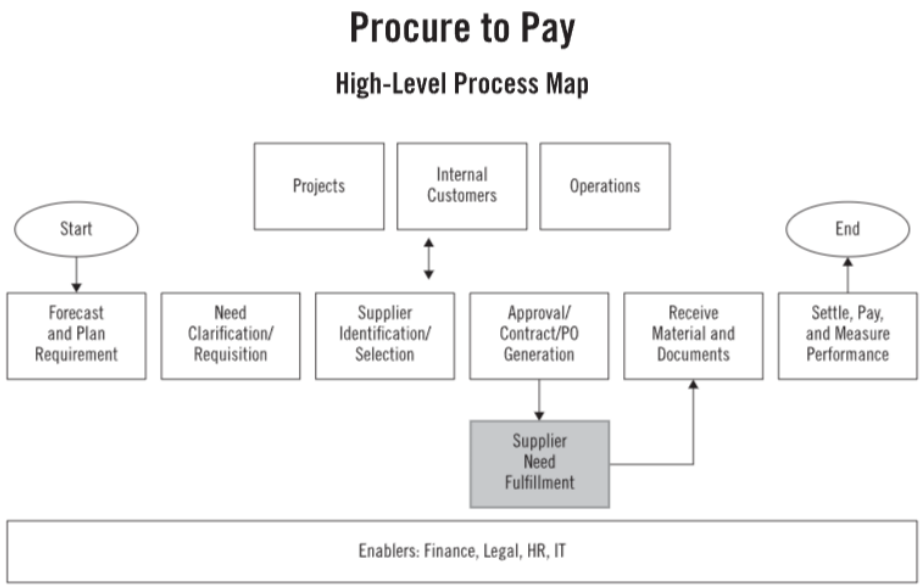

Figure 1 Procure-to-Payment process explained (Monczka et al., 2020).

Figure 1 illustrates the Procure-to-Pay (P2P) process. A flowchart is an effective tool for visualizing and explaining this process. P2P encompasses the entire cycle, beginning with the planning of a good or service and concluding with payment settlement to the supplier (Monczka et al., 2020).

2.1.1 The role of Operative Purchasing in Indirect Procurement

Building an IP team on a global level involves unique considerations compared to a local or regional approach. The driving factors influencing the creation of the IP team include determining where the team will report within the organization, such as to the Chief Financial Officer, assessing the company's growth potential, and identifying the specific goals of the IP function. The team's role within the organization should align with the company's structure. Key considerations include whether the IP department will adopt a centralized, decentralized, or center-led model. Each model presents distinct advantages and challenges:

- Centralized: Provides full control over procurement processes, ensuring consistency and standardization. However, this model may create bottlenecks if not managed efficiently.

- Decentralized: Allows individual business units to handle procurement autonomously. While this model encourages responsiveness and local decision-making, it often lacks standardization and a unified approach.

- Center-led: Combines a centralized strategy with regional execution, offering a balance of flexibility and control. This model can align global objectives with local needs effectively. (Payne et al., 2021)

After selecting the preferred organizational model, IP functions can be divided into operational or strategic roles. Operational roles focus on managing daily procurement activities, such as processing orders, issuing POs, and maintaining communication with suppliers. In contrast, strategic roles emphasize tasks such as sourcing, contract management, spend analysis, and supplier relationship management. Combining these functions within a single role or team can potentially cause inefficiencies. (Payne et al., 2021)

The operational role of IP carries significant responsibility in the P2P process. Key duties include ensuring that stakeholders' purchasing requirements are fulfilled, coordinating the ordering process, and monitoring that items are procured from preferred suppliers, such as catalog-created suppliers. OPs must demonstrate efficiency, alertness, and adaptability to digital changes. Close collaboration with the accounts payable department is essential for smooth payment processes within P2P. Maintaining strong relationships with suppliers and stakeholders is crucial to the success of operational procurement activities. (Payne et al., 2021)

2.2 Digitalization Processes and Tools

As purchasing processes evolve, the organization, stakeholders, and suppliers all require continuous process improvement (Payne et al., 2021). Operations must be carried out quickly, smoothly, and efficiently while remaining user-friendly. To simplify the process for all stakeholders, digitalization efforts must be fully functional and continuously evolving, enhancing collaboration, workflows, and prioritizing user focus (Batran et al., 2017).

Digital tools utilized in IP include e-procurement platforms, enterprise resource planning (ERP) system, data analytics, and automation. Incorporating these tools can potentially allow a streamlined and seamless experience throughout the chain. However, digitalization is not just about tools; it also involves optimizing processes to deliver changes that benefit users and suppliers, emphasizing their needs (Batran et al., 2017).

Looking at the evolution of e-procurement platforms in Figure 2 in Chapter 2.2.1, reveals that email is mentioned as a traditional tool. Despite its digital nature, internet-based systems for these tools were created early in the timeline. Therefore, while email can be considered a digital tool, it can also be positioned as a traditional tool. (Chan & Owusu, 2022) According to Rosenberg (2020), the internet has significantly transformed communication methods since the 1990s. These transformations include email, instant messaging on various platforms, or social media. The latest digital tools could be video chat, ticketing systems acting as surveys for customers, and mobile applications. As a result of digitalization, today's customer support needs to be innovative, versatile and available through numerous channels.

2.2.1 E-procurement

One of the most crucial aspects of digitalization in procurement is the use of e-procurement platforms in organizations. E-procurement, sometimes referred to as P2P, comprehends the transactional workflow associated with procuring goods and services. It simplifies business procurement processes, providing significant cost efficiency and strategic value. (Payne et al., 2021)

P2P solutions are designed to streamline purchasing activities, allowing users to efficiently search for goods and services. These solutions optimize various processes, such as creating PRs and POs, and utilizing sourcing tools. By leveraging P2P solutions, traditional requisition-to-order (PR-to-PO) and order-to-pay (PO-to-Pay) processes can be automated, streamlined, and optimized, thereby enhancing cost efficiency and strategic value. (Payne et al., 2021)

The speed, visibility, accuracy and spend monitoring across the procurement lifecycle have increased, contributing to more efficient and value-adding procurement activities (Payne et al., 2021). According to Abu Bakar, Peszynski, Azizan, and Sundram (2016), the definition of e-procurement offers organizations the opportunity to enhance efficiency in the procurement process and reduce costs.

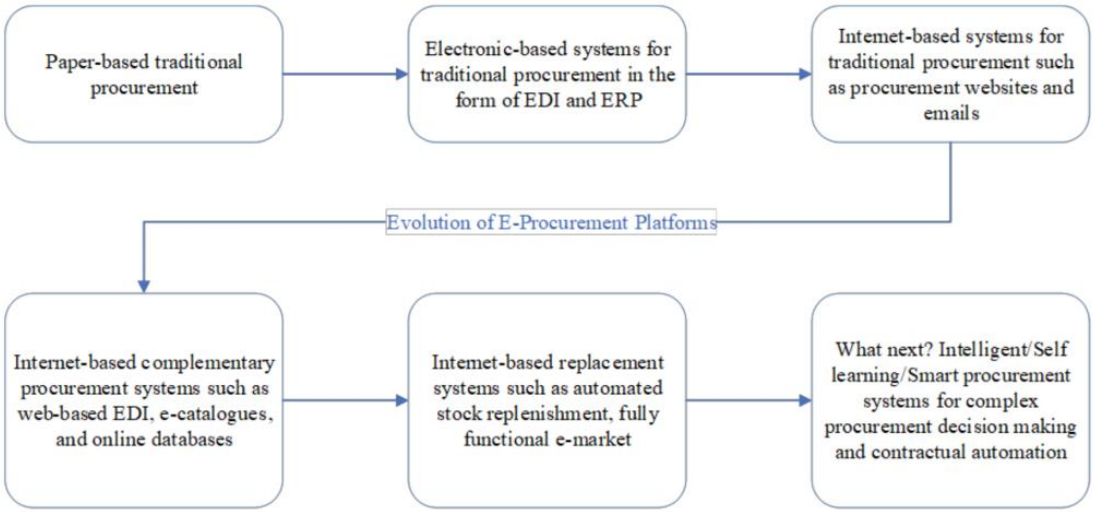

Figure 2 Evolution of e-procurement platforms (Chan & Owusu, 2022).

Figure 2 illustrates the evolution of e-procurement platforms over the years, providing a clear view of how digitalization has transformed the procurement business.

2.2.2 Artificial Intelligence and Robotic Process Automation

E-procurement is closely linked to Artificial Intelligence (AI), as many e-procurement platforms are AI-based. Today's technology leverages AI to streamline business operations and make complex challenges easier to predict. (Roßbach, 2022)

AI is rapidly evolving, and while current applications of AI are widely used across various industries, AI in procurement remains in its early stages (Roßbach, 2022).

According to Roßbach (2022) current applications of AI include:

- Personal assistants to assist users
- Chatbots that engage in conversations with users
- Various types of AI
- Designed to comprehend human language

Self-learning software solutions exemplify the concept of AI replacing humans in procurement. One common form of AI used in procurement is Robotic Process Automation (RPA), which is used in procurement on various tasks, this is a subgroup of AI. RPA is often discussed in the context of AI, it is important to distinguish between the two concepts, as RPA is typically not considered a full AI application. AI is a broad term that encompasses many technologies and concepts, one of which is RPA. (Roßbach, 2022)

RPA focuses on repetitive and algorithms, specifically imitating human physical activities such as performing routine, repetitive tasks. The ability of RPA to perform administrative processes, click buttons, and enter data without human intervention makes it different from other AI applications, which are often geared more toward cognitive functions and decision-making. In summary, RPA is a practical, task-oriented application of AI designed to automate repetitive, rule-based tasks within business processes. (Roßbach, 2022)

Many traditional procurement processes could be revolutionized with AI. However, this transformation is not without its challenges. Errors in payment, pricing, and supplier names can still occur. Despite these challenges, AI-based solutions enable users to access valuable information more efficiently. AI applications in data management can be a significant asset, as they can collect and analyze results much faster than human counterparts. (Roßbach, 2022)

2.2.3 ERP

Enterprise Resource Planning (ERP) is a software application widely utilized in modern organizations. One of the primary purposes of ERP is to integrate information and business processes across various departments within a company. It is considered one of the most critical components of a company's business software portfolio, serving stakeholders from nearly every department. (Sagegg & Alfnes, 2020)

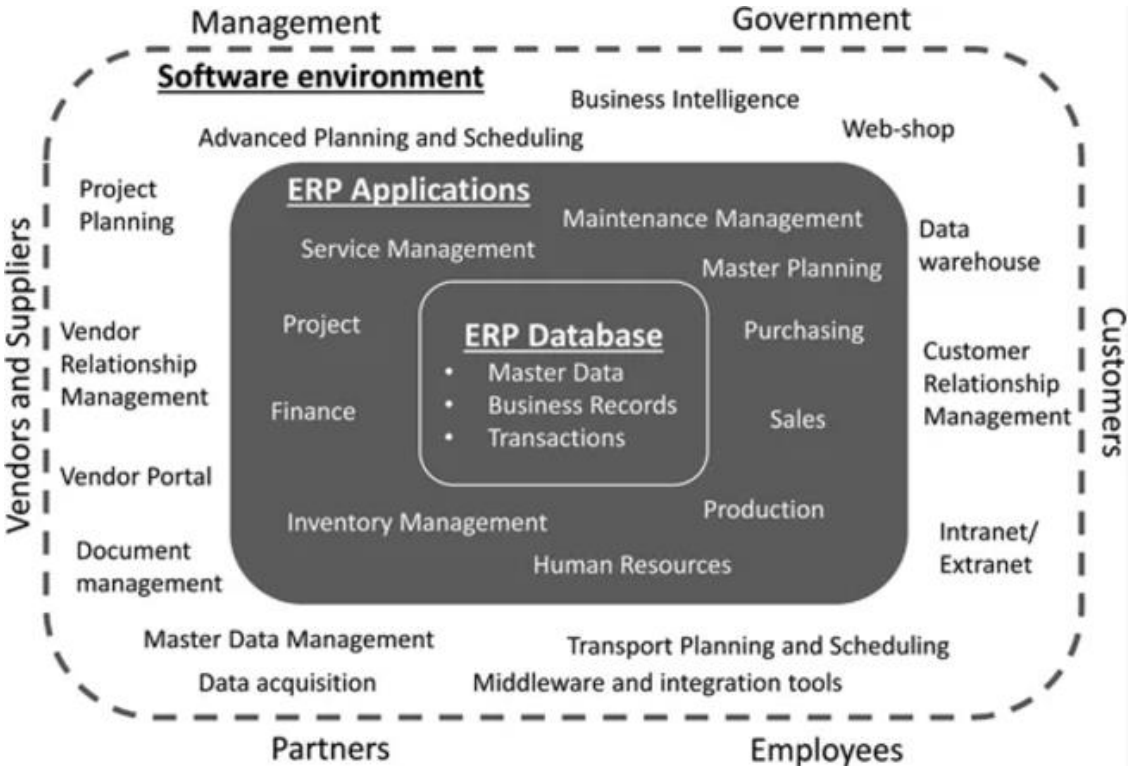

Figure 3 The components of an ERP solution (Sagegg & Alfnes, 2020).

Figure 3 illustrates that an ERP solution, represented in dark color, serves as the core software within business solutions. It consists of a centralized database and pre-built applications that support core business processes, ensuring seamless data sharing among departments. The ERP system's database organizes data into structured tables, storing vast information on customers, inventory, orders, financials, accounting and more. Data sharing and process synchronization occur in real time. (Sagegg & Alfnes, 2020)

ERP systems frequently integrate with third-party tools, such as e-procurement platforms. This integration allows organizations to enhance their capabilities in reporting and transaction management. (Sagegg & Alfnes, 2020)

2.3 Cost Efficiency

Cost efficiency refers to methods of saving money or reducing expenses (Cambridge University Press, 2024). According to Herold, Heller, Rozemeijer, and Mahr (2022), procurement is defined as the process of effectively reducing costs while maintaining high quality and service standards. However, focusing solely on cost reduction is not always the best approach. In certain cases, sourcing high-quality products and services with acceptable delivery time can be more critical (Monczka et al., 2020).

Cost efficiency also involves continuously improving processes and optimizing methods to achieve savings. These reduced costs can minimize labor for purchasers. By using new technology, purchasers can work faster, become more reactive, and enhance efficiency, freeing up time for tasks requiring human decision-making. Digital transformation, from the basic e-procurement solutions developed in the 90s until today. Optimizing and automating process speed and time is transforming the procurement industry. (Herold et al., 2022) E-procurement tools are broadly defined as purchasing tools designed to achieve efficiency (Monczka et al., 2020).

Automation might prevent human errors and reduce administrative costs, such as salaries for time-consuming, non-optimized tasks. Salaries typically constitute the largest share of the purchasing administrative budget, making automation a significant opportunity for cost savings. Streamlining P2P processes through e-procurement platforms and reducing invoice cycle times are prime examples of digitalization benefits. The P2P process involves all the steps from the initial PR to the final payment of the supplier's invoice. By reducing invoice cycle times, organizations can decrease the time purchasing personnel spend on processing invoices, ultimately speeding up supplier payments. (Monczka et al., 2020)

It is important to note that stakeholders' needs are not met if purchasers focus solely on reducing costs. Finding a balance between strategic procurement decisions and cost reduction is crucial. Other factors such as high quality, lead time, delivery accuracy, risks and reliability, must also be considered.

2.4 Strategic Value

Strategic value is a term that can be used in many ways. According to the Cambridge Business English Dictionary (2024), strategic value can be defined as a planned action that is crucial for achieving a specific objective.

In this research, strategic value is categorized into three areas:

- Supplier decision-making and relationships
- Supplier risk management
- Procurement strategies

Starting with supplier decision-making and relationships might be the most important step in the process, commonly defined as strategic sourcing. Purchasers often do not allocate

enough time to identifying suppliers, a task that can feel uninteresting due to the overwhelming amount of information available online. To simplify this process and reduce stress, purchasers might follow the three-bid rule, which involves asking three suppliers for quotes. While this approach can prevent excessively high pricing, it does not guarantee the best possible price or service. (Payne et al., 2021)

Former suppliers can often provide valuable insights into the needs of your organization and the current market. However, it is easy to be persuaded to only include well-known or previous suppliers during the Request for X (RFx) process. RFx is defined as a sourcing event, that includes request for quotations (RFQ), request for information (RFI) and/or request for proposal (RFP). Overreliance on familiar suppliers may lead to missed opportunities for better cost or service performance. Another issue that needs to be addressed is the lack of communication with suppliers during the RFx process. (Payne et al., 2021) RFx events can also be implemented on demand within e-procurement platforms (Coupa, 2024). Traditionally, potential suppliers were identified through industry-specific directories and purchasing guides (Sollish & Semanik, 2012).

In IP, the risk of a company discontinuing operations due to selecting the wrong supplier is reduced (Payne et al., 2021). However, the supplier sourcing phase remains the ideal time to ask, “What type of supplier should we be buying from?” (Payne et al., 2021, p. 37). With digitalization advancing, many digital tools have become available for discovering suppliers as well as providing RFx to suppliers. The purchaser should note that there is a potential advantage in identifying or creating RFx for suppliers that can provide products or services globally. (Payne et al., 2021) Traditionally, risk assessment was conducted using a SWOT (strengths, weaknesses, opportunities, and threats) analysis. (Sollish & Semanik, 2012).

Once the research phase of identifying suppliers is complete and the purchaser has submitted an RFx, the purchaser must evaluate the offers and consider the current market conditions, which may include trends or events within the marketplace, supplier mergers, regulatory changes, natural disasters, and political or socio-economic shifts. Additional factors include cost elements related to quality, freight fees and processing times. Purchasers should also consider suppliers’ technological capabilities such as integration, telecommunication, and their willingness to improve. To further examine the results, the purchaser can perform a total cost analysis to potentially generate cost-saving opportunities. (Payne et al., 2021)

The RFx process with potential suppliers can already be the first step toward a good supplier relationship, as communicating before and during the RFx event can establish a foundation

for collaboration (Payne et al., 2021). According to Payne et al. (2021), it is crucial to not solely rely on the RFx submission. Contacting the supplier, preferably, calling the supplier by phone to achieve more positive results than by sending emails to a general info/sales email address.

Should purchasers use RFx events every time? Depending on the nature of the products or services being procured, independent research may provide sufficient market insights, eliminating the need for an RFx event. Not all markets are suited for an RFx process, nor do all suppliers respond well to direct negotiations. (Payne et al., 2021)

Maintaining supplier relationships with lean supply chain management principles is seen as essential in collective supplier interactions. Supplier partnerships and strategic alliances are considered vital in lean supply chain management. (Rosenberg, 2020)

According to Payne et al. (2021) cost-saving opportunities are wasted due to insufficient implementation plans and supplier management strategies. This is connected to failing to understand the importance of change management. To ensure supplier relationships and achieve savings, it is important to have effective change management and an implementation strategy for converting cost reductions and supplier improvements. Common pitfalls during implementation are resistance to change and end-users having a sense of security with suppliers. This leads to challenges and a slow implementation strategy.

A supplier risk management system can help organizations minimize risk when choosing and using suppliers. The supplier risk management digital tool can be developed in-house or outsourced to third-party companies. Supplier risk management tools assess various risks such as cyber risks, financial risks, and other supply chain vulnerabilities. The digital tools can evaluate supplier information, such as certifications, government regulations, and financial risks. (Payne et al., 2021)

The importance of following a well-defined procurement strategy cannot be overstated. Procurement strategies are highly involved with theories and frameworks such as TCO (Chapter 2.7) and continuous improvement (Chapter 2.8) (Payne et al., 2021). These theories ensure that both suppliers and employees are aligned towards common objectives. This facilitates calculated actions by employees, which can enhance cost savings and quality. They also encourage stakeholders to work with preferred suppliers, thereby building credibility in the department.

However, implementing supplier and procurement strategies is not without challenges. Resistance to change is a major challenge for companies, as end users could have established relationships with existing suppliers and do not want to stop using that supplier. This can lead to stagnation in the continuous improvement process. Even when a comprehensive cost analysis is presented, end-users could potentially have concerns about the new supplier's capabilities. In many cases, misinformation or lack of understanding becomes the greatest obstacle. (Payne et al., 2021)

2.5 ISO 9001:2015

When an organization needs to consistently provide products and services that meet customer and regulatory requirements, it should aim to enhance customer satisfaction through the effective application of the system, including processes for improvement (Dentch, 2016).

The International Organization for Standardization (ISO) is an independent, non-governmental international organization established in 1946. It facilitates collaboration among global experts to develop standardized practices in areas such as product creation and process management. ISO publishes standards aimed at improving efficiency, safety, and quality across various sectors. Among these, the ISO 9000 family focuses on quality management systems (QMS), offering a framework for organizations to enhance their processes and consistently meet customer expectations (ISO, 2024)

According to Dentch (2016), ISO 9001:2015 is a standard designed to improve the overall performance of an organization. It represents a strategic decision that helps organizations reach their goals, enhance performance, and establish a foundation for sustainable development initiatives. ISO 9001:2015 is applicable to all types of organizations. As it is

built on a general framework. The standard is structured around the Plan-Do-Check-Act (PDCA) model.

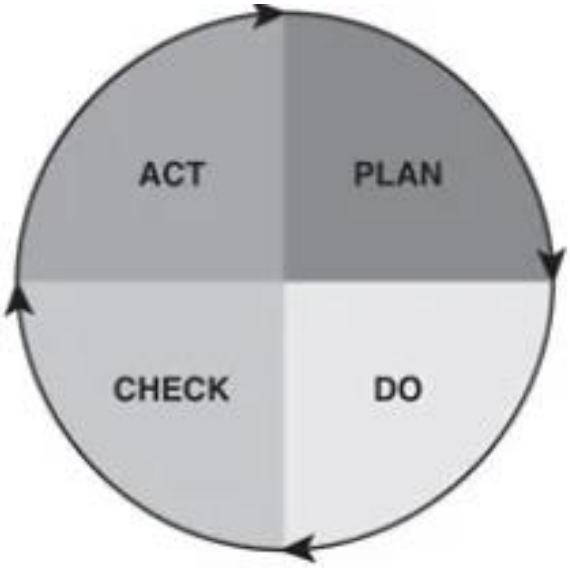

Figure 4 Illustration of the PDCA model (Dentch, 2016).

The PDCA model as illustrated in Figure 4 Illustration of the PDCA model (Dentch, 2016)., outlines a cycle of improvement for implementing and managing QMS effectively (Dentch, 2016).

- Plan: Top management selects the context, scope, boundaries and quality policy of the QMS. They establish specific quality objectives and develop programs to achieve these goals. Key processes are identified, and performance indicators for the processes are set.
- Do: Production and service processes are implemented with controls maintained to meet customer needs. Supporting processes for core operations are also implemented.
- Check: The QMS is monitored to measure performance against the organization's objectives and customer expectations. Performance results are reported to top management.
- Act: Actions are taken to address deficiencies and enhance quality performance based on the monitoring and measurement of QMS outcomes. Resources and employee training are provided to ensure continuous improvement of the QMS. (Dentch, 2016)

The two desired outputs while creating the plans and actions for the QMS involve improvement and customer satisfaction. This standard specifies the requirements for a QMS

when an organization must consistently provide products and services that meet customer and regulatory demands. By integrating processes for improvement, the system aims to enhance satisfaction levels among all stakeholders. (Dentch, 2016)

The next step in building a QMS involves defining the organization's business model, and making sure it links with the relevant ISO 9001:2015 requirements. This process is depicted in Figure 5 Building a QMS as a process (Dentch, 2016).. (Dentch, 2016)

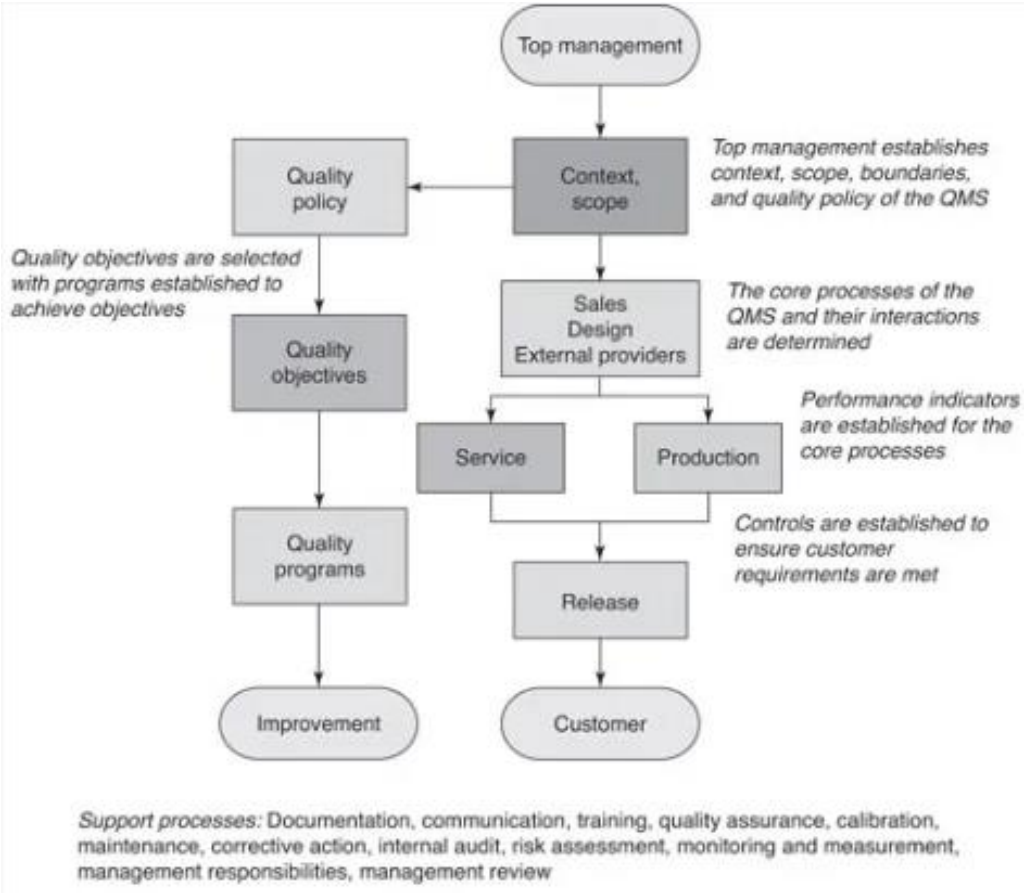

Figure 5 Building a QMS as a process (Dentch, 2016).

By applying ISO 9001:2015 principles such as process control, risk management, and continuous improvement, company operations can be optimized to support overarching business objectives, including stakeholder satisfaction. The internal employees and suppliers are often called stakeholders (Monczka et al., 2020). Process efficiency and continuous improvement are crucial in ISO 9001:2015. The principles in the ISO 9001:2015 may lead to cost efficiency and improved strategic value. (Dentch, 2016)

2.6 FMEA

Risk management is essential for maintaining strategic value in any organization. One effective framework for managing risks is called Failure, Mode, Effect, and Analysis (FMEA) as suggested by the ISO 9001:2015 (Dentch, 2016). American Society for Quality (ASQ), suggest using the FMEA framework when a process or service is being designed or redesigned, when an existing process or service is redeveloped or innovated, when improvement goals are set for a current process or service, when examining failures of an existing process or service, or periodically throughout the lifecycle of the process or service. (2024)

When trust decreases, stakeholders demand higher quality, and managerial demands become more challenging to meet, it might be time to activate FMEA, a proper FMEA will time spent in issue solving and mitigation. Leading to greater resource allocation. Ideally, FMEA is initiated seamlessly at the beginning of production or at the start of a program. (Stamatis, 2019)

According to Stamatis (2019), FMEA can enhance processes in the following areas:

- Achieving high-performance standards consistently.
- Ensuring seamless initiation at the start of a program launch.
- Using advanced technology to consistently improve.
- Responding swiftly to changing demands and opportunities.
- Cherishing a “Can Do” attitude throughout the department.
- Maintaining an obsession with continuous improvement.
- Encouraging teamwork and collaborative success.
- Saying “no” effectively and according to department strategy.
- Significantly reducing overall costs.
- Continuously improving quality throughout the end of the product lifecycle.

FMEA is highly relevant for optimizing processes in pursuit of cost efficiency, particularly by addressing risks when implementing new methods or technologies. For instance, FMEA can assess potential breakdowns in the purchasing process, such as delays in approval cycles, missed opportunities for volume discounts, or inefficiencies in automated systems like e-

procurement platforms. By addressing these risks early, unnecessary costs can be avoided. This approach can also prevent ordering the wrong products or over-purchasing, leading to better cost control. (Stamatis, 2019)

FMEA can also serve as a risk management framework to enhance strategic value, improving supplier risk management, decision-making, relationships, and procurement strategy. By analyzing risks associated with supplier performance, FMEA helps purchasers choose suppliers that align with long-term strategic goals. For instance, identifying suppliers who frequently deliver late or low-quality goods allows the team to reduce orders from these suppliers or switch suppliers, thereby enhancing the strategic value of procurement decisions. (Stamatis, 2019)

FMEA could be a versatile tool that can enhance both cost efficiency and strategic value across various organizational processes.

2.7 Total cost of ownership

In this research, the total cost of ownership (TCO) model will be examined. According to Monczka et al. (2020), TCO is a framework that calculates the total cost of acquiring and using materials or services. This is a valuable tool an organization might use to analyze costs beyond the purchasing price. It tracks the life cycle of the material or services purchased by the organization (Sollish & Semanik, 2012).

The concept of TCO can be explained using the metaphor of an iceberg. The purchasing price is the visible part of the iceberg, while the hidden costs lie beneath the surface. (3 Step IT Group Oy, 2021) These hidden costs include acquisition costs including sourcing, administration, freight and taxes, usage costs including maintenance, support, operational costs, and lastly end-of-life costs including disposal, clean-up and project termination. (Monczka et al., 2020) Figure 6 illustrates that the purchasing price typically represents only one-fourth of the total life-cycle costs (Sollish & Semanik, 2012).

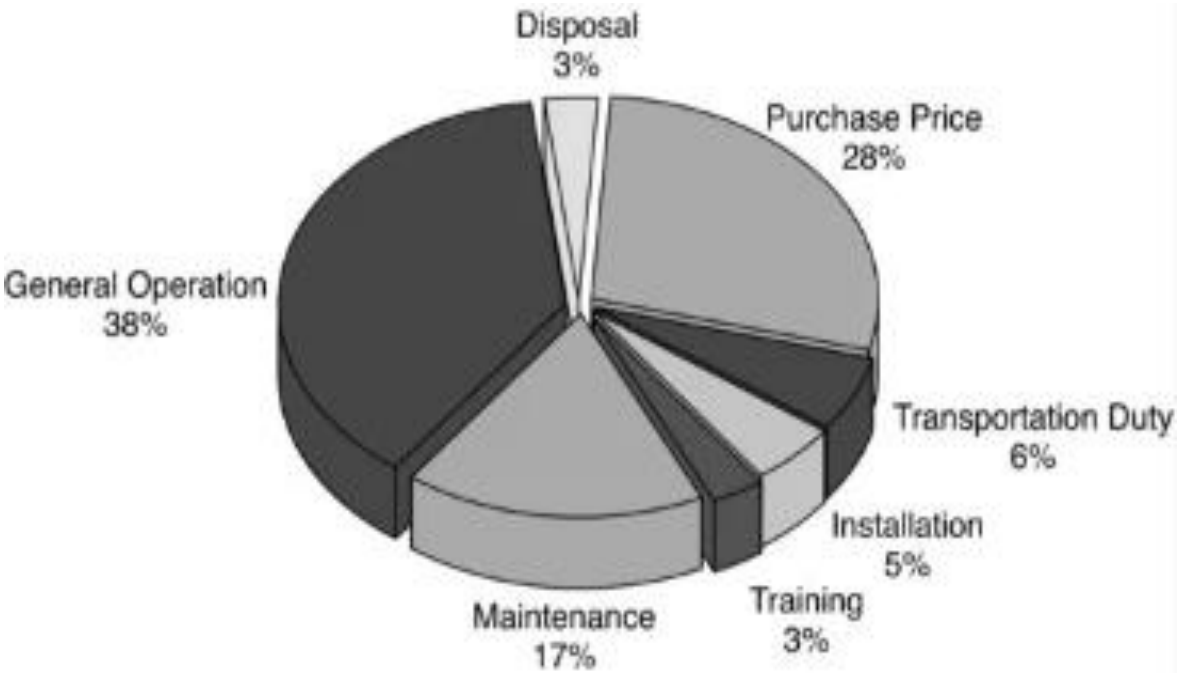

Figure 6 Illustration of the total life-cycle buildup costs (Sollish & Semanik, 2012).

The TCO can be calculated by assessing the direct and indirect costs, along with benefits related to a specific purchase. The calculation shows not only the initial purchase price but also different types of expenses, which can be installations, transportation costs, maintenance, training for support staff and users, and end-of-life disposal. All this helps in making well-educated purchasing decisions by analyzing all costs, and not only the purchasing price. (Sollish & Semanik, 2012)

A strong procurement strategy incorporates TCO considerations for every purchase, including the management of suppliers. TCO is closely linked with both cost efficiency and strategic value in different ways and is further tied to continuous improvement and digital tools. Continuous improvement initiatives informed by TCO can produce cost savings. When properly applied, the TCO model can possibly have a significant effect on e-procurement platforms using catalog-suppliers. (Payne et al., 2021)

2.8 Continuous Improvement

Continuous improvement within IP is considered vital, as procurement is constantly evolving, and demands are shifting according to the constant changes in the market. Management must keep the organization up to date, but not only that, management must ensure that employees and other stakeholders are continuously improving processes, ways

of working, ways of thinking, flexibility, and adaptability to improve cost efficiency and strategic value. (Roßbach, 2022)

To take the key to Japan's competitive success as an example of continuous improvement, could be beneficial to understand its thinking and its significance. *The key to Japan's competitive success* (1986) introduced the concept of Kaizen, which means continuous improvement. Kaizen can be viewed as a tool or component within the broader lean methodology and has grown to become one of the key concepts of business management. A well-known example of Kaizen's success is the Toyota Motor Company, which surpassed General Motors to become the world's leading automotive manufacturer. (Imai, 1997)

Today, organizations worldwide across various sectors endorse Kaizen philosophy. This philosophy wants to focus on constant improvement whether it is at work, socially or in personal life. Kaizen discourages drastic changes, instead advocating for incremental improvements that yield significant results over time. It is also a low-risk approach—reverting to older methods does not incur substantial costs.

There are key concepts in the kaizen strategy, and it is the management that implements these concepts and systems. These include aligning management processes with Kaizen principles, focusing on process versus results, implementing PDCA cycles, prioritizing quality, speaking with data, and the next process with the customer. These concepts should be followed by the top management. They must establish policies and demonstrate commitment by actively practicing the Kaizen methodology within the organization. (Imai, 1997)

Change management involves both planning and implementing new processes and methods of working (Cambridge University Press, 2024). Well-designed implementation and continuous improvement processes can minimize the risks associated with integrating new suppliers while focusing on achieving cost-savings. Continuous improvement also means actively monitoring the market for new opportunities. Organizations cannot rely solely on a contracted supplier, as it is not in the supplier's interest to inform them about competitors or better alternatives. Suppliers must understand that maintaining the relationship requires effort to continuously improve. If they are not able to, the purchasing organization should transition to a new supplier that is more improved or offers some kind of advantage. These improvement opportunities often relate to long-term cost savings. (Payne et al., 2021)

3 Current State Analysis

3.1 Wärtsilä

Wärtsilä is a global leader in innovative technologies and lifecycle solutions for the marine and energy sectors. The company encourages innovation in sustainable technology and services to help customers improve their environmental and economic performance. The company was founded in 1834 in a former municipality of Finland, called Värtsilä, the company has grown to a team of around 17,000 employees in more than 280 locations around the world in 79 countries. (Wärtsilä, 2024)

With a strong focus on innovation and sustainability, Wärtsilä is dedicated to advancing technologies that support the transition to a more sustainable marine and energy industry. The company actively explores digitalization, smart technologies, and hybrid solutions to deliver optimal efficiency, environmental performance, and value to its customers. (Wärtsilä, 2024)

Wärtsilä's operations are mainly divided into two business areas: Wärtsilä Energy and Wärtsilä Marine. (Wärtsilä, 2024)

3.2 Wärtsilä Indirect Procurement

Wärtsilä Indirect Procurement (IP) is a global department within the company's supply chain management. Within Wärtsilä's IP department, there are seven different departments, and each department is split into different regions according to country (Wärtsilä, 2024). The term Supply Chain Management (SCM) means overseeing and optimizing the production and distribution processes of a company's products and services. Effective SCM can streamline a company's operations, reduce waste, maximize customer value, and secure a competitive edge in the market. (Fernando, 2024)

IP has a key role in business support operations, and it refers to the purchasing of goods and services that are not directly involved with the company's production process. While remaining necessary to support daily operations. Procurement in general is seen as a business partner and an Internal Service. (Mena, Van Hoek, & Christopher, 2021)

Within Wärtsilä's IP department, there are two purchasing teams: Operative Purchasing (OP) and Strategic Purchasing (SP). SP is responsible for sourcing suppliers and negotiating contracts, while OP, handle tasks such as validating purchasing needs, ensuring that purchase

orders comply with supply policies, monitoring the purchasing process, addresses invoice mismatches, and more (Wärtsilä, 2024).

The mission of Wärtsilä IP is to ensure a smooth and quick process for employees and create value for customers through the supplier base by having expectations both ways and together continuously working on improving the performance and processes towards operational excellence. To ensure this, they must measure performance and effectiveness and look for opportunities to improve. (Wärtsilä, 2024)

The IP activities are organized into 10 categories (shown in Figure 7) and are responsible for managing the strategic sourcing and operative tasks for indirect materials and services across all business and support functions. IP is a global function at Wärtsilä that serves all employees, functions and businesses in their indirect purchasing needs. (Wärtsilä, 2024)

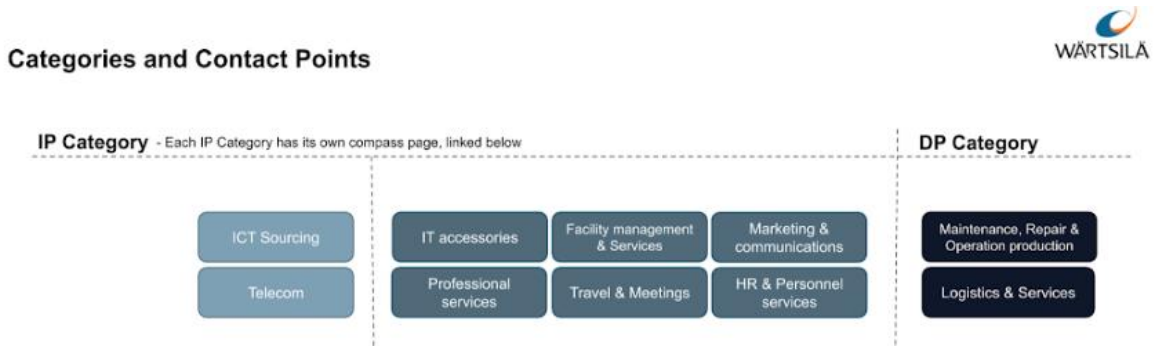

Figure 7 IP organized categories for purchasing needs (Wärtsilä, 2024).

In Figure 7, you can see the 10 organized categories, which are crucial for analytics and accounting. These categories have various scopes to clarify their application across different business purposes.

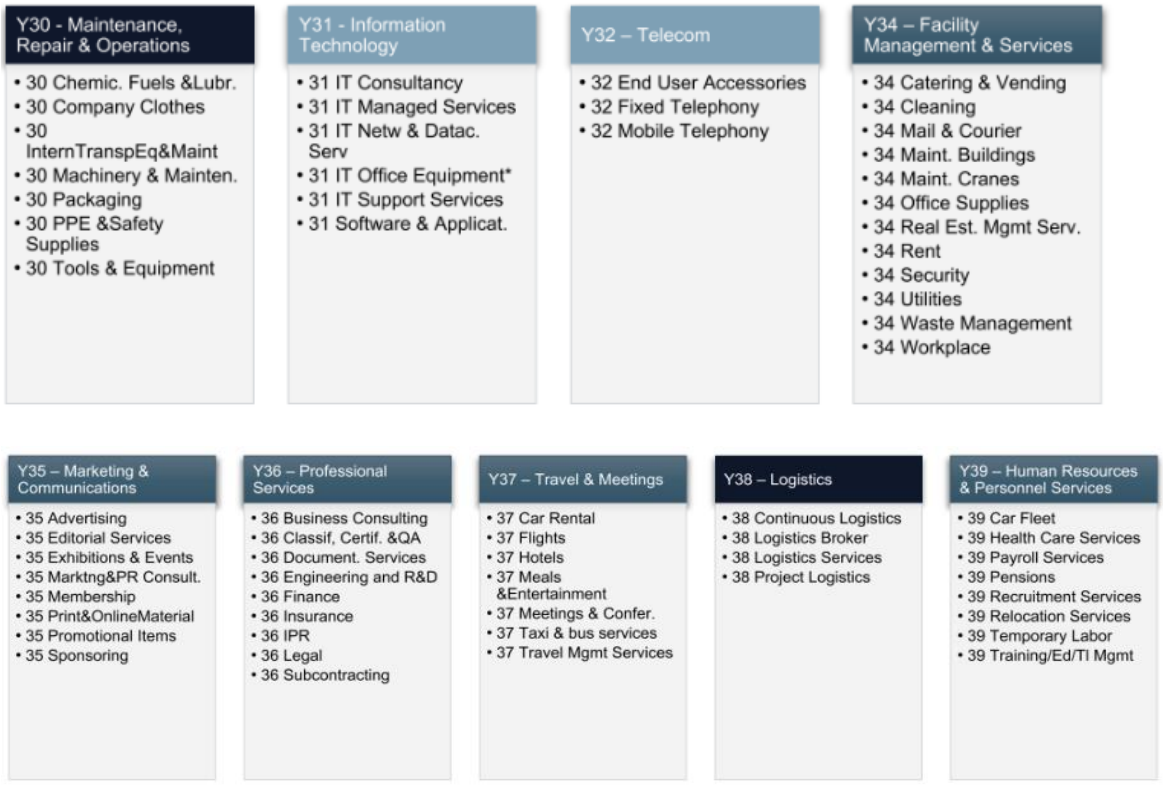

Figure 8 IP category scopes (Wärtsilä, 2024).

Figure 8 highlights examples of category scopes. The categories show what stakeholder purchases belong to IP. These purchases are proceeded via WeBuy (explained in Chapter 3.4.1), with a few exceptions. For instance, items such as laptops, printers, mobile phones, and subscriptions are managed by the ICT purchasing team and processed through a separate internal platform utilizing a ticketing system. (Wärtsilä, 2024)

Wärtsilä IP aspires to be recognized as a high-performing strategic function and a highly valued expert and business partner. The department tries to continuously improve Wärtsilä's supply chain by enabling its stakeholders' businesses and projects to create customer value through professional procurement of goods and services (Wärtsilä, 2024). Stakeholders, defined as individuals, groups, or departments responsible for budgets linked to expenditures, may also be referred to as end-users (Payne et al., 2021).

IP actively collaborates with stakeholders by understanding their business needs and requirements. It is important to keep the stakeholders involved and informed through the PR-to-PO and PO-to-Pay process, as it can delay the processing times otherwise (Payne et al., 2021). IP creates value by selecting and managing suppliers that meet business requirements for quality, lead time, and delivery accuracy while securing cost-effective business benefits.

Additionally, IP selects suppliers that meet Wärtsilä's environmental, social, and governance objectives by accessing sustainability innovation. This enables the decarbonization of Wärtsilä's own operations. Managing and continuously improving the end-to-end value chain for categories such as marketing, IT, travel, and professional services. Lastly, IP leverages digitalization to provide fast and effective day-to-day operational purchasing services. (Wärtsilä, 2024)

In this research, digitalization will be in the limelight, because IP is an important business function and the need of optimizing or evaluating digital processes is crucial.

3.3 Operative Purchasing

Wärtsilä Indirect Procurement is divided into several departments and in this research the role of OP will be profiled. OP is a large department that offers services globally with a regional setup (Wärtsilä, 2024). In this research the region in focus is Finland.

OP handles the sourcing and purchasing of goods and services that are required to maintain the day-to-day operations (Vendr, 2024) While OP at Wärtsilä is not the primary department within IP responsible for sourcing new suppliers or products, as SP is, however, this task is still performed on a frequent basis, often weekly or daily. OP handles the sourcing of products within a predefined low-value limit, which has been agreed upon in coordination with SP. Additionally, OP manages sourcing for one-time suppliers and can propose to SP that a supplier be added as a regular supplier in the internal system. (Wärtsilä, 2024)

The primary responsibilities of OP at Wärtsilä include the following:

- Receive purchase requisitions
- Validate purchasing needs
- Ensure that purchase orders follow supply policy & directives
- Create Purchase orders
- Track deliveries
- Communicate with suppliers
- Monitor the purchase process
- Source low-value items and suppliers

- Negotiate prices, however, escalate higher & unclear supply needs that require tactical or strategic support
- Coordinate and support internal stakeholders
- Give input to purchasing strategy definitions, vendor master data, and WeBuy punchout catalogues
- Monitor and approve invoices in SAP (Wärtsilä, 2024)

This research will examine several of these tasks, particularly those where technology plays a key role, to gain a clearer understanding of the processes and identify potential areas for optimization.

Wärtsilä's OP is a global team composed of professionals operating across multiple countries and regions (Wärtsilä, 2024). The roles and responsibilities of operative purchasers are extensive, encompassing both routine and complex procurement activities essential for the efficient functioning of the organization.

3.4 Digitalization Processes within Operative Purchasing

There are various processes in OP. In this research, the focus will be on cost efficiency and strategic value. The following chapters will review the different digitalized processes and the main digital tools that are used at Wärtsilä OP, which are relevant to this research. In 2.3, the researcher explained the term cost efficiency, and in 2.4 the researcher discussed the concept of strategic value.

The stakeholders' requirements are not met if the purchasers' focus is solely on reducing costs. Finding a balance between strategic procurement decisions and cost reduction makes sense. Factors such as high quality, lead time, delivery accuracy, risks and reliability must be considered. (Monczka et al., 2020)

At Wärtsilä OP, the digital tools WeBuy and SAP are streamlining the P2P processes. RPAs used in WeBuy, SAP, and traditional tools help with potentially reducing invoice cycle times. The PO created in WeBuy is generated into SAP as a PO as well. Therefore, for the invoices to be paid, they must integrate with each other and be nearly identical. (Wärtsilä, 2024)

The following chapters will examine further which primary digitalized tools and processes are used and how these contribute to achieving both cost efficiency and strategic value.

3.4.1 WeBuy

At Wärtsilä, the WeBuy procurement platform is an internal e-procurement platform that streamlines all indirect purchasing needs, ensuring efficiency and ease of use for end-users. When a stakeholder wants to order something not tied to the production process, the end-user will access WeBuy. All indirect purchasing needs must in all cases go through the WeBuy procurement platform (Wärtsilä, 2024). Examples include ordering a monitor, mouse, or arranging consultation services for the whole year of 2024. The end-user informs what is needed in detail and informs where the costs should be allocated (Wärtsilä, 2024). In procurement, the end-user is often the employee who ultimately uses the purchased products or services, or who is responsible for the budget associated with the expense (Payne et al., 2021).

Wärtsilä's WeBuy platform is powered by Coupa. Coupa is a global and trusted company offering different kinds of software services (Coupa, 2024). Coupa is a digital procurement tool that oversees the entire procurement process, including approvals workflows, inventory management, and budget management. Features mentioned as examples include the ability for users to approve actions directly from their email. Coupa also integrates with ERP systems such as SAP, which is used at Wärtsilä. More details about SAP can be found in Chapter 3.4.2. (Rosenberg, 2020)

Electronic procurement or e-procurement is considered a digital tool used in organizations to purchase (Monczka et al., 2020). Wärtsilä, as a global company, has its own developed e-procurement platform, powered by Coupa. These platforms are often used within enclosed firewalls until the specific information is ready to be sent to the supplier (Sollish & Semanik, 2012). WeBuy as a tool is used daily with two types of main users, the purchasers, and the stakeholders wanting to order indirect needs. The employee user profile is limited. When users open WeBuy, they can either search for products directly or select a supplier catalog that is integrated to WeBuy. Development experts create these catalogs for specific suppliers, which redirect users to the supplier's store with Wärtsilä negotiated prices. The users can also choose to make an open order when using a supplier without a catalog, when ordering services, or when they know what they want except where to source it from.

After the user identifies the item they wish to purchase, the page will be redirected to an automated purchase requisition (PR). This is one of the smartest ways to manage the load within procurement (Sollish & Semanik, 2012). This electronic process saves a considerable amount of time. Once the purchasers have checked the PR and made some necessary

changes, they can submit the requisition to the operative purchasers for approval (Wärtsilä, 2024). The operative purchasers then check the PR, complete administrative tasks to ensure it aligns with policies, and ensure it is properly processed. This is then submitted for approval again, and depending on the value of the PR, there will be more people involved in the approval chain. When it has been fully approved the employee will be notified with a purchase order (PO) that has been automatically created with the help of automated processes in WeBuy. The PO will be sent to the supplier as it is a confirmed order. The auto-generated PO number allows suppliers, purchasers, and stakeholders to easily locate the PO, refer to the PO and suppliers can mention this number on the invoice. The PO will also be integrated into SAP, it is important due to various purposes, for instance for invoicing purposes. This will be explained in Chapter 3.4.2. The end-user role is not completed after this. They need to do a "goods receipt" in WeBuy for standard purchase orders. A standard purchase order is a PO that is not a framework order. A framework order is a PO often created for instance services or consulting, where there is a budget and no specific product. (Wärtsilä, 2024)

Purchasers have access to a more detailed view in WeBuy, where many daily tasks are managed. Purchasers' daily tasks consist of going through PR's that have been sent for approval by end-users. The requisitions can be left undone in certain parts, which then must be corrected. Below are common things that need to be checked:

- Ensure the delivery address is current, not outdated.
- Determine if it is a framework order (used for service, maintenance, and consulting) or a standard PO (items).
- Verify that commodity and general ledger (GL) accounts are correct (different category accounts are needed for bookkeeping purposes based on product and order type).
- Check if the end-user has attached an offer from the supplier or provided some kind of price confirmation.

In case there is an order with only the product or service needed and no price, offer, or supplier added, the purchaser can consider potential savings. The process begins with identifying different suppliers offering the product. The purchaser can then source it from various suppliers, either through the WeBuy system or by sending emails to suppliers. Some suppliers are used more frequently and have established good relationships with Wärtsilä, making it more efficient to send them a request for a quotation.

When requisitions are approved by OP, they go through an approval chain depending on the order type. If the requested amount is large, it will first go to the SPs for approval, then to the requester's line manager, and possibly to the line manager's manager. Once everyone in the approval chain has given the green light, the PO is created. POs need daily checks by the OPs for issues like unsent POs, integration errors, and change requests. Things to be checked are unsent lists, integration errors, and change requests. The unsent list includes POs that have not been automatically sent to suppliers. These can be manually sent or only to end-users. Integration errors refer to POs not integrated into SAP, which is critical for accounting. The purchaser must take necessary actions to ensure integration. Change requests are made when the budget on the PO doesn't match the pending or future invoices, common with framework orders where the budget is estimated. These adjustments require re-approval through the approval chain. If the PO proceeds to be created, it should be sent to the supplier. In some cases, this is created automatically, however, sometimes end-users have requested that the PO be sent to them rather than to the supplier. One vital task the end user must complete upon receiving their ordered products is to create a goods receipt (GR), indicating their acceptance of the received goods. Until this is done, the invoice cannot be paid.

3.4.2 SAP

System Analysis Program Development (SAP) is a company founded in Germany in 1972. The company is global with more than 105,000 employees. SAP is known as a global standard for enterprise resource planning (ERP) software. (SAP, 2024)

As stated by SAP (2024) "ERP is a software system that helps organizations streamline their core business processes – including finance, HR, manufacturing, supply chain, sales, and procurement-with a unified view of activity and provides a single source of truth." SAP is right now a global leader in developing standard software for business solutions.

Financial accounting is a crucial component of an ERP system. The financial module used is centered on a GL that organizes financial accounts and integrates with other software, to ensure financial tracking of purchases. The GL is structured through a chart of accounts. (Sagegg & Alfnes, 2020) At Wärtsilä the financial module used is centered on a GL. Purchase orders (POs) in WeBuy are created with GL accounts assigned to each product and service ordered, this proceeds to be integrated to SAP.

Within Wärtsilä's OP, SAP is currently used daily for different tasks, primarily involving invoices and PO creation. Although OP uses WeBuy as the main PO creation platform, some

tasks still need to be carried out in SAP, such as handling products with material codes. Processing invoices is a daily task for purchasers. Accounts Payable, the department at Wärtsilä, responsible for booking invoices, sends them to the purchasers for approval to ensure that the invoice sum is within the PO budget and that details like payment terms are correct. If there are discrepancies, the invoices must be corrected either by making a change request in WeBuy, editing the PO, or emailing the supplier about the issue. Timely invoice management is crucial for maintaining good supplier relationships and requires strong collaboration with the accounts payable team.

SAP utilizes transaction codes to access various tools and tasks within the software. These codes, which consist of letters and/or numbers, are entered into a command field. Users can save frequently used transaction codes as favorites, allowing for quicker access to tasks. (SAP, 2024) One transaction is "/WMD/XF_IV_ADMIN" where OPs receive scanned invoices from AP, that need to be checked and released for payment. Another transaction is called MRBR, that means manual release for blocked invoices (Wärtsilä, 2024). The transaction could be seen as a critical daily task, as invoices might be blocked, due to differences in Webuy and SAP. The issues could be GR, price or quantity. For instance, an invoice cannot be paid until the GR is done, which means it is quite a critical point in the PO-to-Pay process. To proceed with paying the invoice, the invoice must be released from the MRBR list. For it to be possible, the issue needs to be resolved.

It is important to note that the creation of POs in SAP, particularly used for one-time suppliers at Wärtsilä OP. The one-time supplier PO process is not the most user friendly and can be inefficient. Additionally, these POs pose a potential risk for Wärtsilä, as the verification of bank details by the supplier is required, which is a time-consuming task for the purchaser, and other stakeholders can see it as a slow process. The procedure involves both parties completing an Adobe Sign form, emailing it, and awaiting its return. Subsequently, a PO must be created in SAP, which is neither straightforward nor efficient. Fortunately, Wärtsilä has begun utilizing a third-party company to streamline this process, potentially benefiting the entire department. This optimization is discussed in Chapter 3.4.3 of this research, highlighting its potential for cost efficiency and strategic value, even though it is not considered a primary digital tool.

3.4.3 Candex

In 2022, Wärtsilä outsourced the implementation of Candex, a digital tool designed to address “tail spending” issues, to enhance efficiency and streamline administrative tasks within their purchasing processes (Wärtsilä, 2024). Candex is a company founded in 2011, with a mission to mitigate “tail spending” problems within purchasing organizations and is the intermediator between buyer and seller. (Candex, 2024).

“Tail spending” refers to unmanaged spending, typically resulting from a high volume of low-value transactions or misclassified expenditure (Payne et al., 2021). This can include stakeholders ordering from the incorrect suppliers. The term ‘incorrect suppliers’ refers to those that are not preferred according to Wärtsilä’s policies and do not have negotiated prices (Wärtsilä, 2024). By outsourcing engagement, tracking, and paying a supplier to Candex, companies can manage these unpleasant administrative tasks with the help of technology, design, and simplicity created by Candex (Candex, 2024).

The process can be explained by referring to Figure 9 Process description of Candex ., which outlines how the platform operates within Wärtsilä’s IP department when Candex is used as an intermediary.

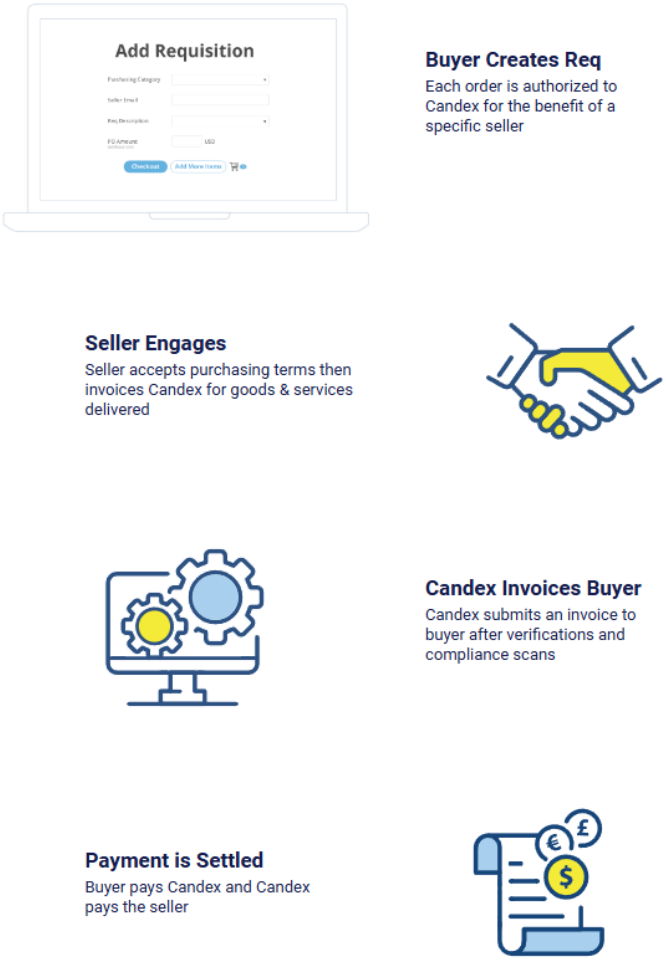

Figure 9 Process description of Candex (Candex, 2024).

In OP, when receiving a PR, it can be submitted by the end-user without a registered supplier in the Wärtsilä system. If there is an offer from the mentioned supplier, and the purchaser deems that the exact product/service cannot be purchased from another supplier, then the operative purchaser can decide to contact the supplier if it would be applicable to use Candex as a third-party payment solution.

For PRs with large budgets, the operative purchaser may collaborate with the SPs, since as mentioned, OP only sources low-value items and suppliers. Together with SPs the purchasers can decide to either register the supplier in the system if the supplier will be used frequently or use Candex as a third-party payment solution for non-frequently used suppliers. The decision is usually based on whether the supplier will be used often or not, however, sometimes the supplier can decline the use of Candex. To clarify, Candex is

mainly intended to be used in Wärtsilä IP as a low-value payment solution for non-frequently used suppliers. (Wärtsilä, 2024)

3.4.4 Candex Integration to WeBuy

The use of Candex in Wärtsilä IP is integrated into the internal e-procurement system WeBuy. A Candex punchout catalog is created within WeBuy, accessible only by relevant employees, for instance, purchasers. This is made to mitigate risks of incorrect utilization of Candex. Compared to the traditional one-time supplier method, the Candex process is designed to be more streamlined and efficient.

The Candex process in OP begins with identifying the potential use of Candex. The purchaser can then quickly send out an email to the requested supplier with a ready template, confirming if Candex is acceptable. The purchaser proceeds to the Candex catalog in WeBuy and creates a new PR that must be approved by the original requester and others in the approval chain. Once approved, the PO is created and sent to Candex, which continues the process, and invoices Wärtsilä for the purchased goods or services. Upon receiving payment from Wärtsilä, Candex will proceed to pay the supplier. (Wärtsilä, 2024)

3.4.5 Robotic Process Automation in Operative Purchasing

RPA software facilitates the automation of repetitive, rules-based tasks across various applications and systems. This automation can lead to significant improvements in efficiency, productivity, and quality. Consequently, it allows individuals to concentrate on more value-added activities. (Wärtsilä, 2024)

The RPA at Wärtsilä OP helps with tasks such as framework budget-to-invoice checking and obtaining approvals from end users. The RPA helps with the MRBR list and prompts end users to complete GR so invoices can be released, and it also alerts purchasers to take necessary actions. The RPA focuses on proactive development to support both stakeholders and team members to reduce repetitive tasks and improve overall quality. RPA is utilized to enhance quality and reduce repetitive tasks, such as the manual workload for purchasers. (Wärtsilä, 2023)

As of 2023, RPAs in production include ZMRBR, Auto GR, PO price changes, framework order price adjustments, email attachments and order confirmations, soft closing POs, PO name updates, PO change requests, and framework order maintenance. (Wärtsilä, 2023)

4 Research methods

This chapter presents the theoretical frameworks and empirical methods employed in this thesis. This is a qualitative study comprising semi-structured interviews with Wärtsilä employees directly involved in the IP and OP processes. The chosen population (24% of OP Finland team) represents a convenience sample selected based on participants' experience and expertise in the field of indirect purchases, ensuring their relevance and suitability for the study objectives (Stratton, 2021). Two of them have a large role in the digitalization and automation process, working as Development experts for the Operative Purchasing team. They are for instance working with e-procurement, ERP and RPA platforms, which is greatly impacting cost efficiency. The researcher will also conduct interviews with two employees who are working in Operative Purchasing in different roles and experiences, to highlight the impact of digitalization on Operative Purchasing from another perspective. Ideally achieving process optimization for OP, in terms of cost efficiency and strategic value.

The choice of qualitative research methods is to conduct a qualitative study when it is needed an intricate and detailed understanding of the challenge being examined (Creswell & Poth, 2023). A qualitative research approach allows for a deeper exploration into the subject of processes and digitalization. It helps acquire a better understanding of how the participants work, their perspectives on current digital tools, how they perceive these tools as efficient and value-adding. This method also provides insights into participants' responses and their deeper thoughts on the matter. Depending on the results received from the qualitative research, current processes can be thoroughly go thoroughly reviewed to determine if any optimizations can be made for better cost efficiency and strategic value. Development proposals will be presented and those will follow the frameworks and theories mentioned in the literature review. (Creswell & Poth, 2023)

4.1 Empirical Methods

The following chapters will present and analyze the empirical methods utilized in this research.

4.1.1 Qualitative research

Qualitative research seeks to understand people's opinions and emotions, rather than focusing on quantifiable data. Quantifiable data is defined as information that can be presented in numbers. (Cambridge University Press, 2024) Qualitative research uses various

methods to interpret and represent the material, making it more understandable. By creating representations of the world, it can change how we see it. (Creswell & Poth, 2023) The representations can be, according to, Creswell and Poth (2023, p. 4), "field notes, interviews, conversations, photographs, recordings, and memos to the self."

According to Creswell and Poth (2023), a qualitative research method requires the researcher to do the following:

- The researcher collaborates with the participants, understanding the time it takes.
- The researcher sorts through time-consuming and large amounts of data, making sense of it.
- The researcher presents reflective, multiple perspectives.
- The researcher does not follow specific procedures and is aware of constant changes.
- The researcher plans how to address possible ethical issues that might surface during the study.

Favorable qualitative research can be assessed through a checklist (Creswell & Poth, 2023).

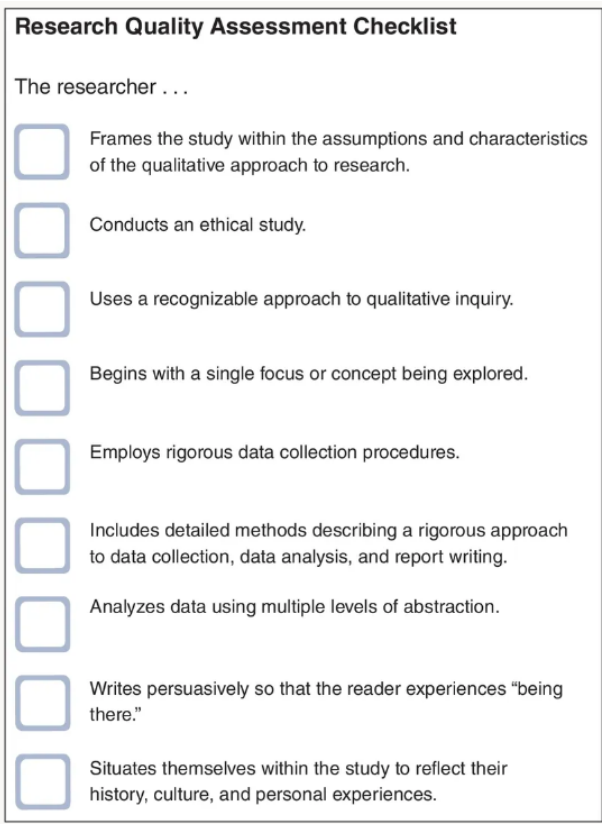

Figure 10 A favorable qualitative research checklist (Creswell & Poth, 2023).

4.1.2 Research Design

According to Bougie and Sekaran (2020) a research design is a strategy for how data will be collected, measured and analyzed to address the research questions of the study. The design is tailored to answer the research questions and is influenced by the study's objectives and the nature of the questions posed. Practical considerations and personal perspectives also play a significant role in shaping the research design.

4.1.3 Data collection

In this research, a structured interview divided into different sections with various topics was conducted. This was made to not make the interview complicated and confusing. An open and flexible interview was still important to gather information based on their own thoughts and experience in the topic. However, since the participants work in different roles within OP and because OP's work tasks are various, the research writer had to keep the interview questions and sections clearly limited to topics relevant to the research. The goal with the interviews was to understand the main digital tools utilized at Wärtsilä OP and to gather information on how digitalization might enhance cost efficiency and strategic value. Additionally, the interviews aimed to capture participants' thoughts on the challenges of implementing these technologies and if there are any relevant traditional methods being used. As the participants had extensive knowledge of the topics from different aspects, it was possible to compare practical experiences to the theoretical ones mentioned in the research. The research writer did not initially ask follow-up questions; however, they were asked when deemed necessary. All questions were conducted identically for all participants.

4.1.4 Ethical Considerations

When conducting a qualitative study, the researcher must be aware of ethical considerations that could arise during field work, in this case, interviews. Three main ethical considerations are typically principles guiding the ethical research process. (Creswell & Poth, 2023) According to Creswell and Poth (2023) it is "respect for persons" (secrecy and permission), "concern for welfare" (reduce harm and boost cooperation), and "justice" (promote inclusiveness and fair treatment).

Conducting an interview requires the researcher to explain to the participants about recordings, obtain permission for them, and clarify what information will be reported and what will remain off the record. It is important to inform the participants that they can decline

involvement if they wish. (Creswell & Poth, 2023) The interviews did not involve particularly sensitive topics; however, privacy and information sharing were still discussed. Any confidential information would be classified due to a non-disclosure agreement signed by the research writer and Wärtsilä. It is the researcher's responsibility to inform the participants about the topic of the research and respect their different knowledge bases and communication styles (Creswell & Poth, 2023).

The participants in the interviews were respected, cooperated extensively, and were treated fairly. The research writer asked participants for permission to interview and to be recorded. Starting by explaining the research topic and defining the terms, cost efficiency and strategic value, to the participants.

5 Results

In this chapter, the results of the conducted interviews will be presented and analyzed. The purpose of this research was to understand the main digital tools at Wärtsilä OP and how they optimize processes for cost efficiency and strategic value. To examine if Wärtsilä OP can enhance these areas and to understand the challenges of implementing these tools, as well as how OP could mitigate these risks. The desired outcome of this qualitative study was to answer all the three Research questions and objectives. The main themes for the interviews were cost efficiency and strategic value within OP. The interview questions were divided into different sections.

- Background and role
- Digital tools and processes
- Cost efficiency and strategic value
- Challenges and improvements
- Closing thoughts and future outlook

The digital tools mentioned in the interviews align with the tools and frameworks discussed in the literature, such as concepts of cost efficiency, strategic value, and continuous improvement. Three of the four interviews were conducted in English. The interview with Participant E, was conducted in Swedish and the results are the researcher's translation of the transcribed interview.

5.1 Participants

The interview was conducted with four employees within the OP Finland team. This indicates that the interviews covered 24% of the entire OP Finland team. The participants were selected based on their experience in OP, role and potential thoughts on optimization of processes. The participants have been coded with P, L, E, and A, and their experience is described in the following:

Participant P: Six years of experience in Wärtsilä OP, plus three years in a similar purchasing role at another company. Past roles at Wärtsilä include operative purchaser, senior operative purchaser, and currently development expert.

Participant L: Eight years of experience in Wärtsilä OP. Roles include operative purchaser and currently development expert.

Participant E: One year of experience in Wärtsilä OP, plus six months as a project purchaser at Wärtsilä. Currently serves as an operative purchaser.

Participant A: Two years of experience in Wärtsilä OP. Roles include operative purchaser and tactical purchaser for the past six months.

5.2 Main Digital Tools and Processes

When considering the current main digital tools and processes in Wärtsilä OP. The participants gave their views on the main digital tools used at Wärtsilä OP. While there were a couple of different answers, there still was two digital tools mentioned by all the participants. The internal e-procurement platform, WeBuy, and the ERP system SAP. Participant L, and A, both agreed on email as a main digital tool. Although participant A was quite unsure if it fit the term “digital tool”. However, according to Rosenberg (2020), emailing is used for communication purposes both with internal and external stakeholders. Email communication could be considered a traditional tool in a sense that it has already been a common tool within procurement since the internet reformation in the 1990s. (Rosenberg, 2020)

Other tools mentioned in the interviews include RPAs mentioned by all participants, specifically by L, who is developing the tool. There was an assortment of miscellaneous tools mentioned in the interviews. PowerBI, for reporting and analytics purposes, ServiceNow and M-Files, ServiceNow for ticketing purposes while M-files for contract and document storing. These were mentioned once, and all participants emphasized that the main ones were WeBuy and SAP. The processes in WeBuy, based on the answers, include processing PRs from stakeholders, working with the created POs, and usage of the sourcing tool incorporated into the platform. The processes mentioned regarding SAP were quite one-sided, since all participants mentioned that SAP is used for invoice purposes. Although, according to P, SAP can also be used in PO related reporting purposes. According to E, almost everything OP works with is somehow connected and integrated into SAP. Participants highlighted these platforms as critical, supporting the TCO theoryu, as stated by Sollish and Semanik (2012), by reducing hidden costs associated with manual tasks, such as supplier management, which can be invoice processing or PO processing.

To assess participants' views on the impact of digital tools on their work, they were asked to inform which digital tools they believe have the most significant impact from the options given. This question aimed to measure what they considered their main digital tool. The answer from all participants is presented in the table below.

Significant Impact	P	L	E	A
A) SAP	A		A	
B) WeBuy	B			B
C) RPA		C	C	
D) Candex				
E) Other				

Table 1 Impact of digital tools according to interview respondents.

Two respondents indicated that two of the digital tools had the most significant impact on their work, while the other two identified just one tool. All respondents provided explanations for their choices. Both P and L work as development experts, and the tools they highlighted are those they specifically have developed and work with. Participant A chose WeBuy, as it is the primary tool used in their daily tasks. Participant E selected SAP, noting that many tasks can be managed and tracked through this ERP system, Participant E also mentioned RPA, as it simplifies work by handling many administrative tasks and repetitive actions required by OP staff. This reflects Monczka et al.'s (2020), argument that automation reduces administrative workload while enhancing efficiency. These findings provide the research writer with insights into the main digital tools used in OP and strengthen the theory as these tools are continuously developed by a professional team. One notable thing is that Candex received zero responses. Due to the researchers experience in the OP work, the reason could be that it is an outsourced tool, it has a punchout catalog and Candex has its own supplier portal, making it feel like a supplier. It is noteworthy that, despite it being used weekly, it is not perceived as a main tool. Possibly due to the fact that it is not necessarily utilized on a daily basis.

To assess the user satisfaction with current digital procurement tools used at Wärtsilä OP, participants were asked to rate their satisfaction on a scale from 1 to 5, where 1 indicated very dissatisfied and 5 indicates very satisfied. This question aimed to measure the perceived effectiveness, efficiency, improvement potential and user-friendliness of the tools.

Satisfaction Level	P	L	E	A
1				
2				
3	3	3		
4			4	4
5				

Table 2 Current tools satisfaction level according to interview respondents.

The responses were split, with two participants rating a 3 (neutral) and two voted a rating of 4 (satisfied). According to their answers and elaborations, it indicates that the development experts who rated a three are more critical, as they are involved in developing and improving these tools. Both experts noted similar thoughts that no tool is 100% complete. P also mentioned ideas and thoughts on improving some of the tools, which also contributed to the neutral rating.

In contrast, both E and A, who are working in more operational tasks, rated the satisfaction level of 4. They expressed that the tools are sufficient for the purchasers' purpose and are user-friendly platforms with various task activities.

5.3 Cost Efficiency and Strategic Value

In this research, the focus has been on cost efficiency and strategic value. This section will show the participants' views on the current digital tools in terms of cost efficiency and strategic value.

All participants discussed how WeBuy and RPA have impacted both cost efficiency and strategic value. According to E, "RPA have significantly sped up the order-to-pay process". L stated that RPA is improving cost efficiency and that, thanks to collaboration with operative purchasers, the combined efforts for continuous improvement of RPA are progressing well. However, both L and P mentioned that no tool is 100%, meaning that a tool is not perfect, and small improvements continuously needed. As L is working as a development expert, they listed questions they ask themselves when thinking about the digital tools; "Can we optimize our process? Can we make it more cost efficient? Can we potentially invest in an external tool to support us, could we consider a robot to help us in our administrative tasks?". Tools like WeBuy streamline operations, improving supplier selection, relationships and cost efficiency, ensuring alignments with strategic value (Payne et al., 2021).

E also noted that thanks to the WeBuy punchout catalogs, the PR-to-PO process has accelerated. End-users find what they want easily, which avoids sourcing from OPs. Additionally, self-approval limits created in WeBuy, speeds up the low-value PR-to-PO process.

All participants agreed that the adoption of digital tools has impacted purchasing lead times and supplier decision-making in a positive way. E mentioned that Candex "opens up opportunities to use new suppliers. It is an easier way out when making decisions." Candex could also be seen as a risk management strategy to enhance the strategic value. In general digitalization was seen as a good thing to improve strategic value. L, even mentioned that "OPs are happy to adopt new tools, however, it has to make sense, they want to see the clear benefit of it."

P mentioned that it is in general a good thing for all parties involved to become more digitalized. However, it is important to make valuations when to use digitalization and when not to, especially when pushing it to a supplier. Challenges will be discussed in chapter 5.4. A mentioned that collaboration with SP is important when thinking about the strategic value, mentioning that contracts must be valid, with agreed hourly rates and/or agreed price lists

for goods and services. “The contracts are stored in M-files so that can be called a digital tool, that is helping the strategic value.” A mentioned that SAP is a crucial tool to store supplier information.

Lastly, a rating scale of 1 to 5 was conducted on how effective the participants find these tools effectively improving cost efficiency and adding strategic value. The participants got the chance to give a rating and open-endedly discussed their decision.

Effectiveness of Tools – Cost Efficiency and Strategic Value	P	L	E	A
1				
2			2	
3	3			3
4		4		
5				

Table 3 Effectiveness of tools – cost efficiency and strategic value according to interview respondents.

The overall discussion with the participants after this question was that digital tools always have room for improvement. As a development expert, P mentioned that WeBuy has functions that enable improvements. E only gave the rating a 2 as he thought that in certain perspectives it is much is up to the purchaser to contribute to cost efficiency and strategic value when using these tools. This aligns with the Kaizen principles mentioned in Chapter 2.8 by Imai (1997), ensuring processes are frequently assessed and in line with principles of continuous improvement. Overall, the participants highlighted the positive impact of digital tools on cost efficiency and strategic value, while also acknowledging the need for continuous improvement and careful evaluation of digitalization efforts.

5.4 Challenges and Improvements

During the discussions with P, he mentioned on the supplier side that the relationship could potentially become sour if OP is pushing a new digital tool that they do not want to use.

Always room for improvement for all tools, According to P, WeBuy has the possibility to enable functions for improvement. Continuous improvement was mentioned by all participants as an important subject in digitalization of procurement tools.

A key challenge identified by a majority of the participants was that change is not always easy to propose to both purchasers and stakeholders. Many employees can be uncomfortable adapting to new tools or processes, which necessitates training. The employees' thoughts must be taken into consideration and to take their feedback when developing the tools. Participant E mentioned that every new tool comes with a learning curve, potentially taking focus away from the daily tasks. Resistance to change as noted by Batran et al. (2017), interviewees cited user resistance and limited technical training as key barriers to adoption. Similarly, Payne et al., (2021) mentioned resistance to change in procurement strategy aspects.

Similarly, A highlighted that releasing tools too early, without proper testing, can result in bugs that create additional workload. Something where FMEA could be activated, as according to Stamatis (2019), FMEA could help with improving processes in an area such as, seamless initiation at the beginning of the start of a program. Participant P emphasized the importance of involving users in the transition process to ensure smoother adoption, stating that proper training and preparation can mitigate risks. Participant L noted that also the quality and accessibility of data are critical barriers. The ability to transfer and use data efficiently in new tools is often disrupted by connecting multiple systems and making them communicate with each other. This barrier was also noted by P, who pointed out that ensuring seamless integration between tools is essential for maximizing efficiency. The integration issues show the challenges with seamless digital tools, ensuring seamless integration was also a theme highlighted in the ERP framework (Sagegg & Alfnes, 2020).

When discussing areas for improvement all the participants suggested developing current digital tools to make them more efficient and user-friendly. For example, A proposed adding guided pop-up messages in WeBuy to support stakeholders during the purchasing process. This is something that is in use already in certain cases, however this is a suggestion that could be implemented more often. The participants identified several emerging technologies

as potential opportunities. Both P and L suggested implementing AI-powered chatbots to assist with routine procurement tasks, such as generating PRs and guiding users through processes. L also proposed market intelligence tools to identify optimal pricing options. A majority of the participants mentioned AI as an emerging technology. Both P and A noted that the new version of SAP is coming to Wärtsilä next year, which could be a crucial improvement.

When asking the participants regarding support from management and risk mitigation strategies, the participants provided mixed feedback on the level of support for digitalization initiatives.

- Most respondents rated the support from management as satisfactory, with scores ranging from 3 to 4. However, P noted that there are improvements in management's willingness to consider day-to-day operational needs. The discussion about management also highlighted the efforts of people organizing training and supporting one another.

- In terms of risk mitigation, A pointed out that new tools are often tested in limited regions before a full-scale rollout to ensure functionality and minimize risks. Candex rollout at Wärtsilä IP was mentioned as an example of this strategy. However, all the participants were certain that there are risk mitigation strategies, even though they were not directly responsible for them.

When asked which areas of procurement should be prioritized for digital improvement, participants provided varied responses based on their roles. The researcher gave the participants choices:

Area for Digital Improvement	P	L	E	A
A) Supplier decision making and supplier relationships	A	A		A
B) Supplier Risk management			B	B
C) Procurement strategies				
D) Data analytics	D	D		D
E) E-procurement platform	E		E	
F) Other (please specify)				

Table 4 Area for digital improvement according to interview respondents.

Answers by P and L were suggested due to their relevance to current tasks. Although they were not responsible for it, both wanted to see improvements in supplier decision-making and supplier relationships.

The findings from this chapter highlight the challenges and opportunities associated with digitalization operative purchasing. A key takeaway from the findings was how all the participants emphasized continuous improvement, which they felt was essential for refreshing procurement tools. While the current tools have potential for optimizing, participants also mentioned new technology, particularly AI and market intelligence tools, for future advancements. The discussion on areas for digital improvement revealed quite similar responses. Supplier relationships, risk management, data analytics and e-procurement platform were seen as key areas to focus on improving. The finding also reinforces the importance of embracing continuous improvement. Additionally, when

developing improvements, it is crucial to use models such as PDCA to identify gaps in processes and enhance user experience.

Challenges are a critical focus for Wärtsilä OP. Issues such as employees' resistance to change, complications of system integrations, and the need for user-friendly solutions highlight the importance of strategic planning and employee and stakeholder trainings. Support from management in terms of risk mitigation suggests room for improvement, as participants could not mention more than one mitigation strategy. Overall, the support from management and people organizing training and supporting one another was on a good level.

5.4.1 Traditional Tools

The role of traditional tools at Wärtsilä OP was discussed with the participants. Are there any traditional tools being used still, and if so, why? All participants advocated for a hybrid approach, using traditional tools when appropriate and complementing them with digital tools. This hybrid method appears to be the recommended approach.

Participant A discussed how using email and phone calls with suppliers makes the connection more personal and can be an advantage in many cases, ensuring clarity and building trust. "Digital tools are becoming more popular, however traditional methods like emails and phone calls still have their place." While relying too heavily on emails and phone calls can slow down processes compared to automated workflows, they can also struggle with large volumes of tasks. Participant P pointed out that emails make it harder to measure the volume and nature of inquiries compared to ticketing systems. However, sometimes a phone call is so much faster than any other method, so in urgent cases, phone calls are still preferred option. Participants L and P even mentioned Excel as a tool often used, specifically for making calculations, noting that sometimes it just makes sense to use it.

In conclusion, traditional tools like email, phone calls, and excel remain relevant in procurement due to their flexibility, practicality and ability to build relationships. While digital tools dominate many areas, traditional methods can provide complementary benefits that enhance strategic value. A balanced approach that utilizes both traditional and digital tools ensures that procurement processes remain cost-efficient.

5.5 Closing Thoughts and Future Outlook

The participants' responses to the final set of questions provided valuable insights into team dynamics, skills for digital procurement, and their outlook on new digital trends and continuous learning. Important perspectives from employees at OP highlight both the current state of digitalization in OP and the potential for future optimization.

When discussing team dynamics when implementing new tools, the participants described their teams as collaborative. Participant A noted that overall collaboration is effective but noted that continuous efforts are needed to ensure all team members are aligned during tool implementations. Participants E, P, and L mentioned occasional gaps in collaboration, particularly across regions, as well as within the Finland region, especially in preparation for changes. There is room for improvement, especially when introducing new tools.

Several potential improvement suggestions to existing tools were made by the participants.

- A suggested that the existing tool M-files could be developed, and more user guidance and training should be provided.
- L emphasized that high-quality data storage ensures smooth integration when connecting to other systems.
- P discussed regarding a unified tool that could handle all procurement needs, while acknowledging the challenges by developing such a solution in a large organization that has different needs and requirements in processes.

Participants noted the skills needed for success in digital procurement in adaptability and continuous learning. The researcher asked the participants to rae on the scale of 1-5 regarding continuous learning in OP. All participants rated continuous learning as either very important or extremely important (4 and 5 on the scale). As A noted "Learning goes hand in hand with digitalization," underscoring the need for employees to keep up with the new advancing technology. L noted that not continuously learning could mean that stakeholders could be frustrated, and it could also hinder operational efficiency. L highlighted that, soft skills, such as communication and stakeholder engagement, have become more critical than hard skills in the digital age. This can potentially build better collaboration and user experience. E and P also discussed basic technical knowledge, as well as cost awareness and familiarity with digital tools. As stated by Stamatis (2019), cherishing a "can do" attitude across the

department, fostering team dynamics and collaboration can be improved with the help of FMEA.

The researcher asked the participants about new exciting trends in the digital world and future possibilities. A majority of the participants answer shortly with the answer, AI. A proposed finding new methods of communication between stakeholders and suppliers, raising efficiency and strategic value. Additionally, participant E raised a critical question about the cost efficiency of some tools, such as Candex, wondering if it is more cost-efficient? Does its convenience outweigh the actual financial benefits? This highlights the need for evaluation of new technology when taken into use at Wärtsilä OP.

6 Conclusions and Recommendations

The following chapters will discuss the conclusion and address recommendations from the research.

6.1 Conclusion

This research provides a comprehensive analysis of the role digital tools play in optimizing operational processes (OP) at Wärtsilä. This research addressed three critical research questions.

The interview findings reveal that key digital tools, such as WeBuy, SAP, and RPA, play a significant role in enhancing cost efficiency and strategic value in Wärtsilä's operational processes. These tools streamline procurement tasks, reduce administrative workloads, and improve supplier management. This alignment with theoretical models, such as TCO and continuous improvement principles (Kaizen), underscores their strategic importance.

The primary digital tools identified were WeBuy and SAP, which are recognized as crucial to daily operations in OP. Tools like RPA support administrative efficiency, while PowerBI ensures data-driven decision-making. Although PowerBI was not discussed in the literature or the current state analysis, participants noted its significance. Conversely, digital tools such as Candex, despite managing the tail spend, are less integrated into daily operations. As an outsourced and relatively new tool, Candex is perceived as less significant.

Participants noted several advantages of these tools:

Cost Efficiency: Digital platforms reduce manual work and errors while integrating processes such as PR-to-PO conversion.

Strategic Value: Digital tools enable improved supplier relationships and streamlined supplier decision-making.

Despite these benefits, challenges arise. Participants pointed out resistance to change, technical integration issues, and user training gaps as barriers to fully maximizing digital transformation. Which also was noted in the literature review of this research. The interviews also revealed the importance of continuous learning and adaptability among employees, emphasizing that digital transformation requires not just tools but also a culture of creativity and collaboration.

Traditional tools used in OP highlight the challenges in digital transformation. However, traditional tools, including email and Excel, continue to play a significant role in OP by offering flexibility and simplicity whereas other digital tools may fall short. Participants emphasized using a hybrid approach, advocating for flexibility and balance during transitions to new technologies.

The findings reveal that Wärtsilä's OP relies heavily on WeBuy, SAP, and RPA as primary digital tools. These platforms streamline procurement tasks, reduce manual errors, and improve supplier relationships. Tools like RPA enhance cost efficiency by automating repetitive tasks, while WeBuy and SAP significantly improve both cost efficiency and strategic value by optimizing the P2P process.

Continuous improvement emerged as a recurring theme. While current tools are effective, participants emphasized the need for ongoing enhancement, as no tool is ever 100% complete. Issues such as integration and user-friendliness were discussed. With the help of emerging technologies, specifically AI and market intelligence, Wärtsilä can further improve cost efficiency and strategic value. However, finding the correct balance between advanced AI, such as chatbots or ticketing systems, and traditional methods, such as communication with stakeholders and suppliers, is necessary to ensure that OP remains an internal customer service provider, for which it has been praised.

Previously mentioned challenges were not the only ones. Resistance to change among employees, stakeholders, and suppliers emerged as a recurring theme during the interviews. Employees can struggle to adapt to new tools, especially if they are not convinced of their importance. However, Wärtsilä OP can tackle this challenge through effective communication and high-quality training.

Adopting tools like chatbots and ticketing systems presents challenges, as traditional tools such as email communication might be phased out. This was highlighted as an important aspect of communication with both stakeholders and suppliers. Even tools like Excel and phone calls are still used in specific contexts, such as urgent communication or analyzing budgets for orders. Therefore, it is crucial to mitigate these challenges by employing flexible and creative operational processes at Wärtsilä.

6.2 Recommendations

Finally, to conclude the research, recommendations were suggested to Wärtsilä OP to strengthen procurement processes, achieve higher levels of cost efficiency and strategic value, and prepare for future advancements. These recommendations are based on the research results from experienced OPs and the researchers' own thoughts and suggestions.

Management must address user resistance challenges by clearly communicating the need to implement new digital tools, listening to the OPs, and ensuring that training is tailored for the OPs.

Prioritizing the integration challenges between digital tools, specifically SAP and WeBuy, is essential to improve data flow and reduce errors. Features like guided pop-ups or interactive tutorials could be implemented.

Expanding the use of AI-powered tools for analyzing supplier performance, forecasting procurement needs, or handling routine tasks like generating PRs is recommended. Ensuring that hybrid methods, combining both AI and traditional tools, are used will help maintain flexibility and creativity. Traditional tools are important for supplier communication, as they build more trust and transparency.

Continuing the use of continuous improvement to refine existing tools is crucial, as they provide a solid foundation for enhancement. One risk management strategy when trying out new digital tools could be to test them in one region or team at a time. Maintaining collaboration between departments to work towards the same strategy is also important.

Utilizing theories such as FMEA could be relevant for optimizing processes in OP, as Wärtsilä can use it to manage risks and improve high performance standards. FMEA could also serve as a risk management framework to enhance strategic value in OP, improving supplier risk management, supplier decision-making, relationships, and procurement strategy.

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[i]

[i] AI has been used ethically as an alternative to Google for finding sources and for language proofreading texts.

Appendix

Interview Questions

Section 1: Background and Role

1. Can you describe your role in the Operative Purchasing team?

2. How long have you been working in this role?

Section 2: Digital Tools and Processes

3. Could you describe the main digital tools currently used within Wärtsilä's operative purchasing?

4. On a scale of 1 to 5, how effective do you find these tools in improving cost efficiency and adding strategic value?
(Rating scale)

5. Which of the following digital tools do you believe has the most significant impact on your work?
(Multiple choice)

- A) SAP
- B) WeBuy
- C) Automated robots
- D) Candex
- E) Other (please specify)

6. How has the adoption of digital tools impacted decision-making and purchasing lead times in the operative procurement process?

Section 3: Challenges and Improvements

7. What are the main challenges Wärtsilä faces when introducing or integrating new digital tools within the operative purchasing function?

8. How would you rate the support you receive from management when adopting new technologies?
(Rating scale) 1-5

9. Are there existing risk mitigation strategies to handle challenges?
10. In your opinion, what is the biggest barrier to digital transformation in your department?
11. Is there a role for traditional tools within the digital framework? If so, why are these tools still relevant?

Section 4: Strategic Value and Future Outlook

12. How do you see digitalization enhancing strategic value in Operative Purchasing?
13. What improvements or additional functionalities do you believe could further enhance the effectiveness of digital tools in operative purchasing?
14. Are there any emerging technologies or processes that could enhance cost savings and strategic value in the coming years?
    (Open-ended)
15. On a scale of 1 to 5, how prepared do you feel your team is for future digital advancements?
    (Rating scale)

Section 5: Collaboration and Team Dynamics

16. How might collaboration across departments be optimized through digital tools to further reduce costs and improve supplier relationships?
    (Open-ended)
17. Which of the following best describes your team dynamics when implementing new tools?
    (Multiple choice)

- A) Highly collaborative
- B) Somewhat collaborative
- C) Neutral
- D) Not collaborative

Section 6: Personal Insights and Advice

18. What skills do you believe are essential for success in digital procurement?
    (Open-ended)

19. If you could change one thing about the current digital tools used in your department, what would it be?
(Open-ended)

20. On a scale of 1 to 5, how satisfied are you with your current digital procurement tools?
(Rating scale)

- 1: Very dissatisfied
- 2: Dissatisfied
- 3: Neutral
- 4: Satisfied
- 5: Very satisfied

Section 7: Closing Thoughts

21. How important do you think continuous learning is in the field of digital procurement?
(Rating scale)

- 1: Not important
- 2: Slightly important
- 3: Moderately important
- 4: Very important
- 5: Extremely important

22. What trends in procurement technology are you most excited about?
(Open-ended)

23. If you had to choose one area of procurement to focus on for digital improvement, what would it be?
(Multiple choice)

- A) Supplier decision making and supplier relationships
- B) Supplier Risk management
- C) Procurement strategies (preferred suppliers, total cost of ownership analysis, sustainable procurement)
- D) Data analytics
- E) E-procurement platform
- F) Other (please specify)

24. Is there anything else you would like to share about your experiences with digitalization in procurement?
(Open-ended)

IN SWEDISH for interview with one of the participants:

Avsnitt 1: Bakgrund och Roll

1. Kan du beskriva din roll i Operative Purchasing-teamet?
2. Hur länge har du arbetat i denna roll?

Avsnitt 2: Digitala Verktyg och Processer

3. Kan du beskriva de huvudsakliga digitala verktygen som för närvarande används inom Wärtsiläs operativa inköp?

4. På en skala från 1 till 5, hur effektiva tycker du att dessa verktyg är för att förbättra kostnadseffektiviteten och tillföra strategiskt värde? (Betygsskala)

5. Vilket av följande digitala verktyg anser du har störst påverkan på ditt arbete? (Flervalsfråga)

- A) SAP
- B) WeBuy
- C) Automatiserade robotar
- D) Candex
- E) Annat (vänligen specificera)

6. Hur har införandet av digitala verktyg påverkat beslutsfattandet och ledtiderna för inköp i den operativa upphandlingsprocessen?

Avsnitt 3: Utmaningar och Förbättringar

7. Vilka är de största utmaningarna som Wärtsilä står inför när nya digitala verktyg introduceras eller integreras inom den operativa inköpsfunktionen?

8. Hur skulle du betygsätta det stöd du får från ledningen vid införandet av ny teknik? (Betygsskala 1-5)

9. Finns det befintliga riskhanteringsstrategier för att hantera utmaningar?

10. Enligt din åsikt, vad är det största hindret för digital transformation i din avdelning?

11. Finns det en roll för traditionella verktyg inom den digitala ramen? Om så är fallet, varför är dessa verktyg fortfarande relevanta?

Avsnitt 4: Strategiskt Värde och Framtidsutsikter

12. Hur ser du att digitalisering ökar det strategiska värdet i Operative Purchasing?

13. Vilka förbättringar eller ytterligare funktioner tror du kan ytterligare öka effektiviteten av digitala verktyg i operativa inköp?

14. Finns det några framväxande teknologier eller processer som kan öka kostnadsbesparingar och strategiskt värde under de kommande åren? (Öppen fråga)

15. På en skala från 1 till 5, hur förberedda känner du att ditt team är för framtida digitala framsteg? (Betygsskala)

Avsnitt 5: Samarbete och Teamdynamik

16. Hur kan samarbetet mellan avdelningar optimeras genom digitala verktyg för att ytterligare minska kostnader och förbättra leverantörsrelationer? (Öppen fråga)

17. Vilket av följande beskriver bäst din teams dynamik när nya verktyg implementeras? (Flervalsfråga)

- A) Mycket samarbetsvillig
- B) Något samarbetsvillig
- C) Neutral
- D) Inte samarbetsvillig

Avsnitt 6: Personliga Insikter och Råd

18. Vilka färdigheter anser du är nödvändiga för framgång inom digital upphandling? (Öppen fråga)

19. Om du kunde ändra en sak med de nuvarande digitala verktygen som används i din avdelning, vad skulle det vara? (Öppen fråga)

20. På en skala från 1 till 5, hur nöjd är du med dina nuvarande digitala upphandlingsverktyg? (Betygsskala)

- 1: Mycket missnöjd
- 2: Missnöjd
- 3: Neutral
- 4: Nöjd
- 5: Mycket nöjd

Avsnitt 7: Avslutande Tankar

21. Vilket råd skulle du ge till någon ny inom Operative Purchasing angående digitala verktyg? (Öppen fråga)

22. Hur viktigt tycker du att kontinuerligt lärande är inom digital upphandling? (Betygsskala)

- 1: Inte viktigt
- 2: Något viktigt

- 3: Måttligt viktigt
- 4: Mycket viktigt
- 5: Extremt viktigt

23. Om du var tvungen att välja ett område inom upphandling att fokusera på för digital förbättring, vilket skulle det vara? (Flervalsfråga)

- A) Leverantörsbeslut och leverantörsrelationer
- B) Leverantörsriskhantering
- C) Upphandlingsstrategier (föredragna leverantörer, total ägandekostnadsanalys, hållbar upphandling)
- D) Dataanalys
- E) E-upphandlingsplattform
- F) Annat (vänligen specificera)

25. Finns det något annat du vill dela med dig av om dina erfarenheter med digitalisering inom upphandling? (Öppen fråga)