LAPPEENRANTA-LAHTI UNIVERSITY OF TECHNOLOGY LUT
School of Engineering Science
Degree Programme in Industrial Engineering and Management

Aleksi Huttunen

LEAN AND AUTOMATION IN DATA-DRIVEN FINANCIAL MANAGEMENT

Master's Thesis

Examiners: Professor Timo Kärri
Post-doctoral researcher Antti Ylä-Kujala

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ABSTRACT

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Keywords: Data-driven Financial Management, Lean Six Sigma, Process Development, Query Automation, Report Automation, Robotic Process Automation, Data Strategy

In a digitalizing world, the systematic utilization of data through ever-evolving technologies creates enormous opportunities for companies to develop operations and decision-making. However, in order for data to be utilized as desired and processes to be automated with data, business-driven practices and standardized processes must be built to ensure data quality and usability. In addition to understanding business needs, it is important to keep up with technological opportunities by continually ensuring that the company's resources are up-to-date and that staff skills are at the required level.

In this work, the current state of target company's financial management is clarified, processes to be developed are prioritized, a model for automating the processes is produced, and a strategy for further increasing data utilization and the degree of automation is created. The work introduces Lean Six Sigma process development methods and modern automation technologies, which aim to eliminate manual and unnecessary work and create an atmosphere of continuous development, enabling people to use their working time to create and communicate value-adding analyzes and conclusions. A better understanding of the business created with the data enables better decision-making and more competitive operations in the company, which will help the company better meet the needs of its customers.

TIIVISTELMÄ

Lappeenrannan-Lahden teknillinen yliopisto LUT
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Tuotantotalouden koulutusohjelma

Aleksi Huttunen

Lean ja automaatio dataohjautuvassa taloushallinnossa

Diplomityö

2021

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Digitalisoituvassa maailmassa datan systemaattinen hyödyntäminen ja hallinta jatkuvasti kehittyvien teknologioiden avulla luo yrityksille valtavia mahdollisuuksia toimintojen ja päätöksenteon kehittämisessä. Kuitenkin, jotta dataa voidaan hyödyntää halutulla tavalla ja prosesseja voidaan automatisoida datan avulla, on dataohjautuvuuden perustaksi rakennettava liiketoimintalähtöiset käytännöt ja standardoidut prosessit datan laadun ja hyödynnettävyyden varmistamiseksi. Liiketoiminnan tarpeiden ymmärtämisen lisäksi on tärkeää pysyä teknologian ja menetelmien kehityksessä mukana varmistamalla jatkuvasti yrityksen resurssien ajantasaisuus ja henkilöstön osaamistason riittävyys.

Tässä työssä selvitetään kohdeyrityksen taloushallinnon nykytila, priorisoidaan kehitettäviä prosesseja, tuotetaan malli taloushallinnon prosessien automatisoimiseksi, sekä luodaan strategia dataohjautuvuuden ja automaatioasteen nostamiseksi tulevaisuudessa. Työssä perehdytään Lean Six Sigma prosessikehitysmenetelmiin ja automaatioteknologioihin, joiden avulla pyritään manuaalisen ja turhan työn eliminoimiseen sekä jatkuvan kehityksen ilmapiirin luomiseen, mahdollistaen ihmisten työajan käyttämisen arvoa lisäävien analyysien ja johtopäätösten tekemiseen sekä kommunikointiin. Datan avulla luotu parempi ymmärrys liiketoiminnasta mahdollistaa paremman päätöksenteon ja kilpailukykyisemmän toiminnan yrityksessä, mikä auttaa yritystä vastaamaan asiakkaidensa tarpeisiin paremmin.

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In addition, I want to thank my family, friends, and girlfriend for supporting me in both studying and other life, I would not have been able to do this without you and you are a very important part of my life.

Now I have moved to Helsinki and am starting with new challenges in a new job, and I am sure that the lessons and experiences I have gained so far have created a great foundation for my future. I start this new phase of my life curious and excited to a great extent.

30.08.2021

Aleksi Huttunen

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ABBREVIATIONS

AI	Artificial Intelligence
API	Application Programming Interface
BI	Business Intelligence
CDO	Chief Development Officer
CFO	Chief Financial Officer
CRM	Customer Relationship Management
DAX	Data Analysis Expressions
DMAIC	Define, Measure, Analyze, Improve, Control
ERP	Enterprise Resource Planning
IT	Information Technology
KPI	Key Performance Indicator
LSS	Lean Six Sigma
ML	Machine Learning
NVA	Non-value-adding
RPA	Robotic Process Automation
SIPOC	Supplier, Input, Process, Output, Customer
UI	User Interface

1 INTRODUCTION

Firstly, the introduction chapter of this study examines the background of the research topic. Key issues related to the topic are the rapid development of digitalization and its effects on the financial management industry and the technologies and systems used in financial management processes, as well as the target company's specific needs to develop their financial management processes. In addition, this chapter also reviews the goals of the research, research problem, and the scope chosen for the research. At the end of the introduction chapter, the research methods and material are described and finally the structure of the rest of the report is described.

1.1 Background

In a rapidly changing and digitalizing world, more and more is expected from financial management in a company. Digitalization is one of the current megatrends that is revolutionizing processes and practices in companies and the effects of digitalization are visible in almost all industries. (Kaarlejärvi & Salminen 2018, 20-23) In the age of the knowledge-intensive economy, competitive advantage is increasingly based on the exploitation of knowledge and intangible capital rather than traditional physical resources, and this requires an environment and technology to make effective use of the data and knowledge bound to individuals and systems. (Puusa & Reijonen 2011, 307) Digitalization can mean a new way of doing business, made possible by innovation and the development of technology, in which the faster and easier sharing and processing of information can create value for customers and society more and more efficiently. (Hämäläinen, Maula & Suominen 2016, 21) In the field of financial administration, the development of digitalization and electrification of various processes and functions can be considered to have started decades ago, according to Alhola (2010) and Kaarlejärvi & Salminen (2018). The development from paper-based financial administration, where all materials and documents had been processed or at least archived mainly on paper, to electronic financial administration has taken place quite calmly, but now in the era of digital financial administration, the industry is experiencing more radical and faster changes than ever before (Kaarlejärvi & Salminen 2018, 29).

Thanks to the quick development of digitalization, companies are continuously finding new ways to streamline and develop their business by leveraging new intelligent digital solutions, and thus improving their efficiency. This also forces other companies to respond to the rapidly changing competitive environment, by among other things, changing and developing their skills, culture, and strategy. (Aalst van der, Bichler & Heinzl 2018; Ilmarinen & Koskela 2015; Weill & Woerner 2015) From financial management perspective, whereas in the past the work of financial management has been mainly the production of various reports, accounting, and data for its stakeholders, today it is said that the most important work of financial management is only begun when reports and accounting are completed and conclusions, recommendations and value-adding insights can be drawn for financial management customers (Kaarlejärvi 2020).

Also in the target company, there is another emerging need to develop financial management processes, as the company has gained large new customers recently and the growing business is causing more work in financial management. As the workload increases, the need for efficiency increases to cope with existing resources without the need to increase the workforce. Currently, even before the new customers, the financial management department in the company has spent most of its time coping with basic processes, and there is often urgency and pressure to finish work in time, especially in various anomaly situations and seasonal times. A large proportion of time is used doing repetitive work tasks and coping with problem situations. The goal is to develop processes so that the need for additional hands can be replaced by automation tools and more efficient and sensible processes, which increases work efficiency, value, and meaningfulness.

The goal is to reduce haste, human error, and incidents, as well as to have the workforce to be able to respond to incidents appropriately when they occur. In addition, the whole company is currently on a strategic journey towards more data-driven culture and operations, and also the financial management is expected to be able to support this change. When these goals are achieved, financial management will be able to produce higher quality reporting more reliably and efficiently, as well as further analyzed information and recommendations to support the company’s functions instead of just figures and reports. Employees are freed up to do value-creating work and are encouraged to create continuous improvement instead of repetitive

routine tasks, which also improves job satisfaction and the relevance of work from the employees' perspective. Even if a large proportion of current work could be automated in the near future, the goal is not cost savings by reducing staff, and savings as well as additional value can be achieved as a by-product when processes improve and begin supporting the other functions of the business better.

1.2 Research problem and scope

This master's thesis finds out how the Lean Six Sigma define, analyze, improve and control (DMAIC) problem solving model as well as modern automation tools such as Robotic Process Automation (RPA) and Query and Report Automation can be utilized to streamline and automate digital financial management processes and implement that knowledge in a target company to assist developing their financial management. The goal of the work is to create a model of automating financial management processes by performing and documenting development efforts for a selected process, as well as producing a road map-style plan that helps the company continue going towards more data-driven operations and decision-making in the future.

In other words, the aim of this study is to find out how modern automation tools can be utilized in the financial management of the target company and how processes can first be developed to more efficient and standardized form using process development practices in order to make automation efforts as effective, purpose-built, and sensible as possible. The goal is to create a model and culture for continuous development in the company, and to provide them with information of how to keep increasing the degree of automation in the future. To be able to properly address the research problem, first the current state of the target company's financial management processes and work tasks must be mapped, in order to properly target development efforts and prioritize the processes to be developed. Finally, also an understanding of the next steps in process development and management will be needed in order to be able to manage and develop the issue in the future as well. The following research questions are used to find answers to the research problem:

- How to identify financial management processes to be developed and prioritize them?

- How Lean Six Sigma DMAIC practices can be combined with modern automation tools to improve and automate financial management processes?
- How to increase the utilization of data and degree of automation in financial management step by step?

Once the research questions have been answered in theory, the study limits to only looking at one financial management process in the company and implementing the acquired information in that process to create an understanding and a model of how these development efforts can be done. Microsoft data tools in Excel and Power BI are chosen as a tool for Query and Report Automation, and UiPath has been chosen as a tool for RPA implementation, as licenses already exist in the company, and the utilization of these technologies has already been proven effective in a few processes, so technology-specific automation research in this study focuses on these tools. After completing the improving of the said process, focus will be shifted back to the overall picture of the financial management in the company, to be able to produce the road map for future development. Next, the methods and materials used to seek answers to the research questions are presented.

1.3 Research methods and data

This research requires a wealth of modern theoretical knowledge on different areas, such as knowledge of financial management and its current and future challenges, knowledge of modern financial management technologies and systems, knowledge of automation tools and their implementation and applicability to different processes, knowledge of LSS process development methodologies, and knowledge of process mapping and prioritization tools. This study first uses a literature review to gather latest information on all of these aspects and seeks to understand their connections so that this information can be put to practical use later by implementing it in the financial management of the case company and its specific needs.

The methods to gain understanding of the case company and its processes and needs are different workshop group meetings and interviews with the company's financial management experts and people working on the processes. In these workshop meetings, for example process maps are created and examples of how the processes work in practice are presented to be able to learn the key issues to be developed. Another key purpose of these meetings is to educate the

company's financial management workers on the subject with lecture-like presentations to provide them with information and tools to improve other processes in the future. Using this knowledge, the processes to be developed can be assessed and prioritized using factors such as the processes' employee involvement, complexity, volume, standardization, stability, and difficulty of outsourcing (Ostdick 2016). Finally, by combining the knowledge acquired from the literature review with the results and learnings from the case implementation, a road map on how to keep increasing the degree of automation in the financial management of the company will be created and discussed. This part of the work can be seen as a combination of case study and design science, producing a model for automating financial management processes and a strategy for further developing the issue, taking into account the needs of the case company.

1.4 Structure of the report

Next in Chapter 2, the literature review first introduces financial management and its key tasks as well as the challenges and opportunities that modern financial management faces in a digitalizing operating environment. In addition, trends and technologies emerging in the field of financial management are discussed and the future of the sector is considered. This is followed by discussion of Lean management philosophy in the financial management expert work and process development with Lean Six Sigma DMAIC problem solving framework, the purpose of which are to eliminate waste from processes and bring them into the most standardized and efficient form possible to enable optimal utilization of automation. After that Query and Report Automation and Robotic Process Automation will be discussed in general and their opportunities, challenges, and suitability as a technology for developing financial management processes will be focused in particular.

Using the information produced by the literature review, Chapter 3 examines the current state and operating environment of the target company's financial management with the help of group workshop meetings with the company's experts and seeks to find solutions and best practices that are appropriate for that particular case. First, the current state of the company's financial management is defined, and the most important financial management processes are mapped out. Then, using various analysis tools, the processes that should be improved are first

identified, of which one process is further prioritized, for which the implementation of the first DMAIC cycle and automation will be done.

After finishing the development of that process, Chapter 4 reflects on the results of the case implementation and presents a road map-style plan for further action to keep increasing the degree of automation in the target company based on the results and the literature. After that, conclusions are drawn in the Chapter 5, and a future research topic is considered. The structure of the whole work is described below in a summarizing Figure 1.

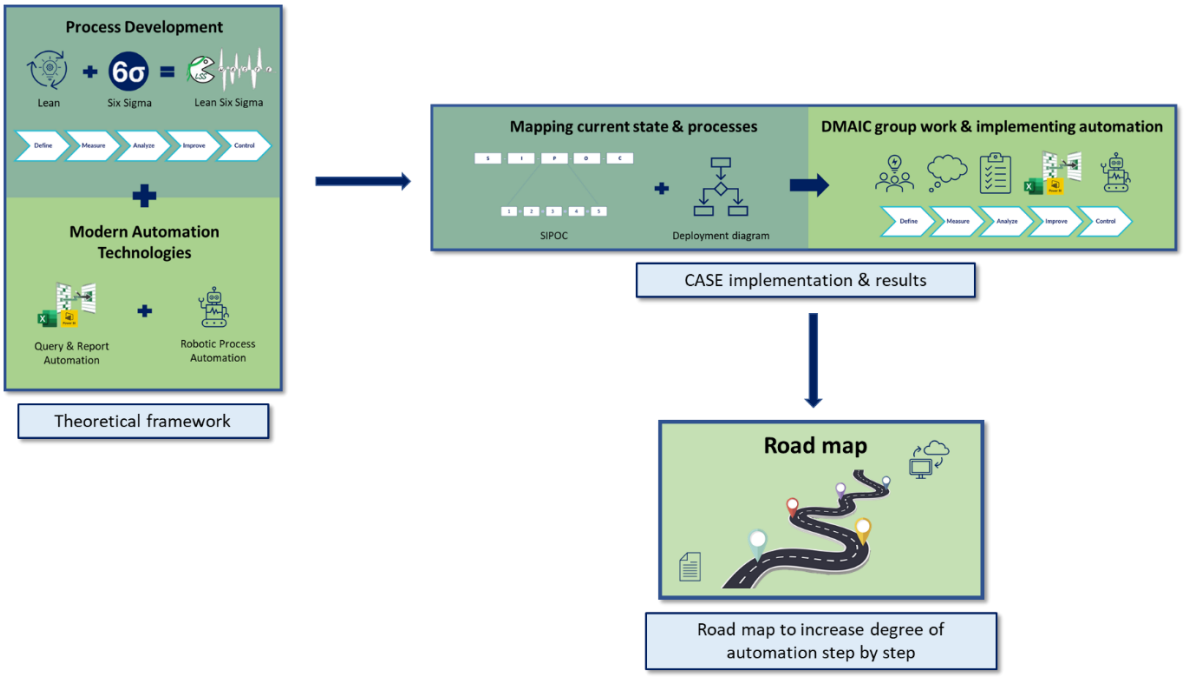

Figure 1 The overall picture of the work

2 LEAN SIX SIGMA AND AUTOMATION IN FINANCIAL MANAGEMENT

This section examines the latest literature in the areas relevant to the research, and thus seeks to provide the most comprehensive overview possible on the subject. In addition to a comprehensive overview and in-depth thematic understanding, the aim is to identify the links and purposes between these topics so that the right tools and methods can complement each other and be used purposefully to achieve the best results. Combining these topics into an overall picture provides a modern understanding of automated financial management and its requirements, such as intelligent, business-friendly processes, quality data, efficient utilization and presentation of information, rational work organization, the right kind of know-how and the proper use of technology.

2.1 Financial Management today and in the future

Financial management is a function that transforms an organization’s operations into a financial form and reports on the results of those operations. Financial management consists of data, processes, people, and information systems that produce documents, cash flows, and internal and external reporting. External reporting consists of, for example, accounting and other reporting to the company's external stakeholders. Financial statements and tax-related reports are the most important outputs of external reporting. External reporting is therefore a well-defined and mandatory activity by law and regulations. Internal reporting, on the other hand, serves employees at various levels of the company and is intended to assist the company's internal operations, which makes it value-adding by nature. The level of detail of reporting varies depending on the enterprise group it is targeted at. For example, reporting to management is more concise and forward-looking, while reporting to experts focuses in more detail on analyzing the current state of the company and more detailed problems. Figure 2 below illustrates financial management in a company.

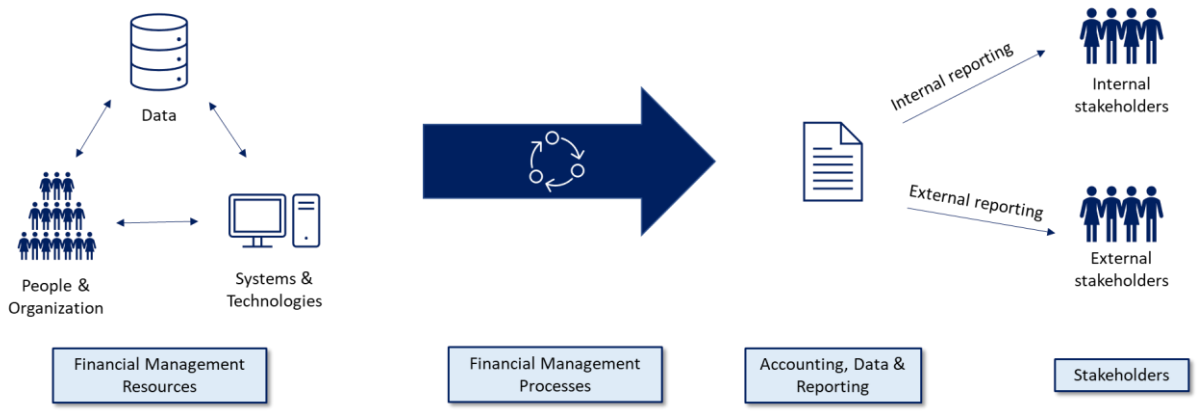

Figure 2 Financial management in a company

Traditionally, the purpose of financial management in a company has been to manage the company's financial resources and to produce related reports and accounting for both internal and external use, fulfilling regulatory obligations. Today, however, financial management is increasingly seen as a strategic business partner for the rest of the company, which should be able to support the company's management in making the right strategic decisions by producing value-adding analyzes and conclusions of the company's financial condition and related challenges and opportunities. The basic processes and reporting mentioned earlier should therefore work effortlessly and efficiently in the background to leave resources for supporting strategic decisions that are important for the business and its future. (Strutner 2020; Kaarlejärvi 2020)

Thus, with huge amounts of data coming from different sources, the collecting and conversion of data into information should be done largely automatically so that human resources can be used to interpret and communicate information instead of mostly collecting it and recording it into the systems. In digital financial management, the use of modern technologies allows data to flow automatically between processes and systems, allowing people to act more as the users of the produced information as well as problem solvers. (Kaarlejärvi & Salminen 2018) The differences in the distribution of resources between old-fashioned and digital financial management are illustrated in the Figure 3 below.

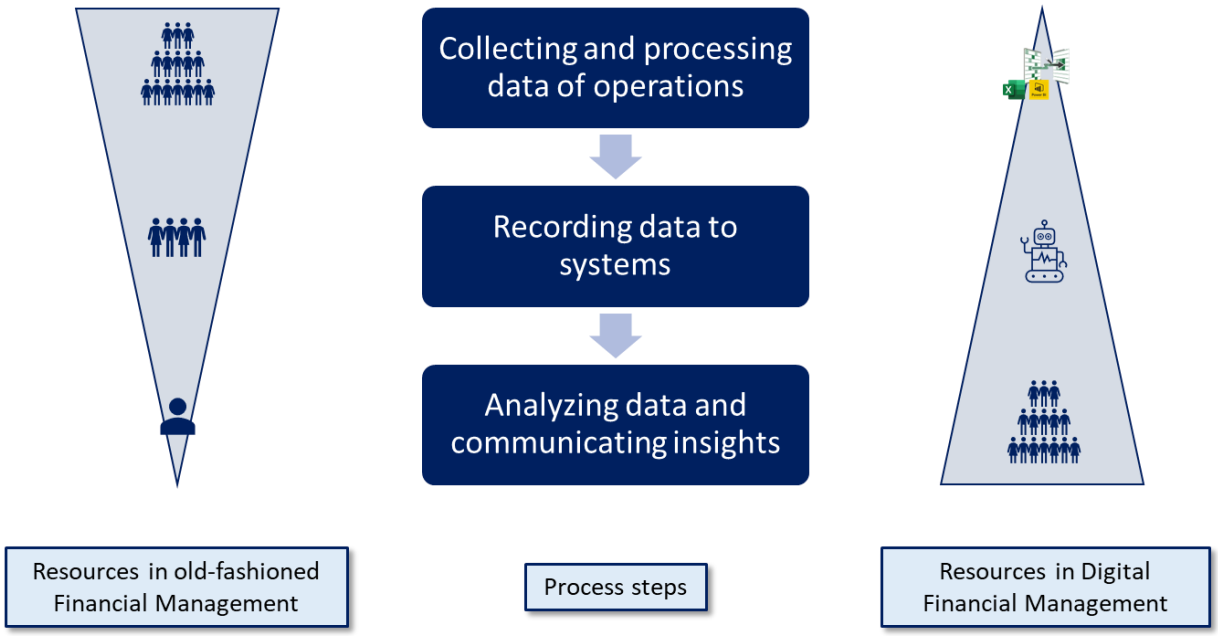

Figure 3 Resource allocation in old-fashioned vs Digital Financial Management

This ongoing transformation of the financial management industry, made possible and accelerated by digitalization, has been going on for a long time, and the development of information technology and new systems is seen as the most significant factor for this evolvement. Certain functions in financial management have long been handled electronically, but as systems evolve, more and more processes are handled better, more efficiently, and more interoperably in digital form, making it advantageous for companies to maximize digitalization in all of their financial management processes. (Kurki, Lahtinen & Lindfors 2011; Kaarlejärvi & Salminen 2018) The most important processes of financial management from the perspective of main accounting and its sub-processes are illustrated below in the Figure 4.

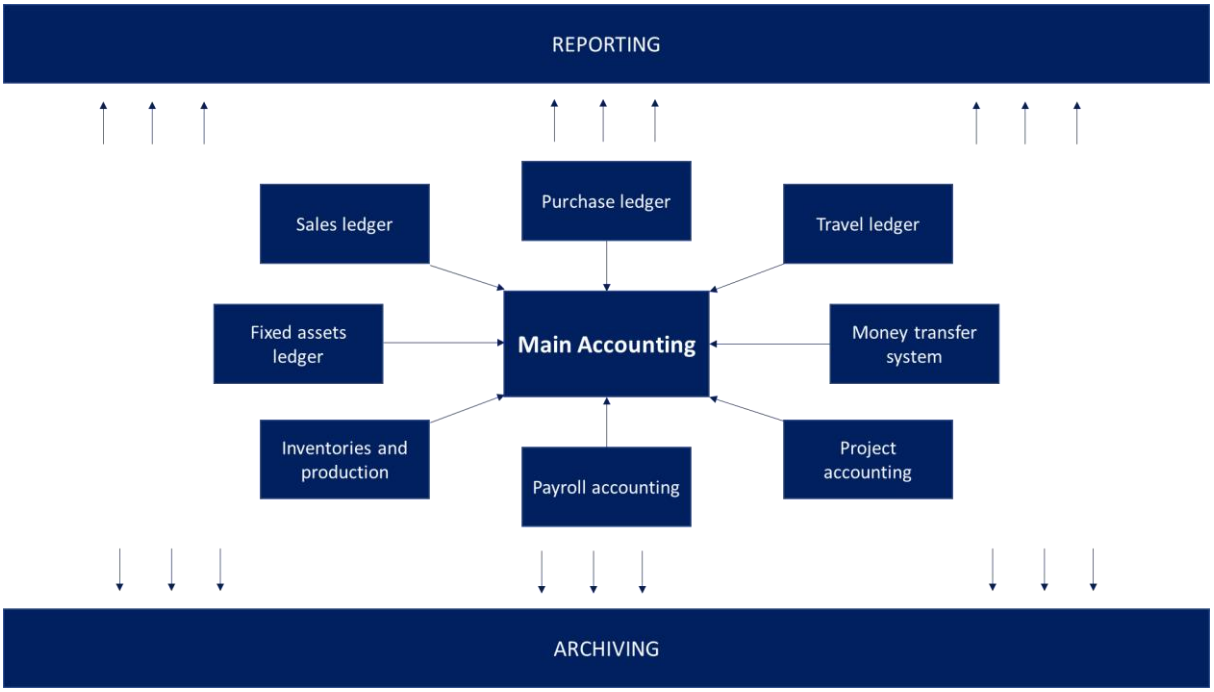

Figure 4 Accounting perspective of Financial Management processes (Kaarlejärvi & Salminen 2018)

In digital financial management, all stages of accounting and related sub-processes take place as automatically as possible and the related information flows are processed in digital form, avoiding the same information being processed multiple times. When the accuracy of the information in the sub-processes can be relied upon, the task of the main accounting is only to compile the information of the sub-processes and for example make various periodizations. When this part of the process is automated, the accountant is freed up to analyze the produced information and communicate the insights to shareholders. (Bhimani & Willcocks 2014; Lahti & Salminen 2014; Kaarlejärvi & Salminen 2018)

More specifically, digital information flow processing means that all the financial management information is transferred electronically between the company's stakeholders, processes, and systems. Digital financial management is also characterized by the fact that documents are archived in digital form and they are machine-readable from the databases, and the processing and reporting of transactions is automated. (Bhimani & Willcocks 2014; Kaarlejärvi & Salminen 2018) Digital financial management can also be called integrated financial management, because it is closely integrated into the company's real processes. These

integrations apply not only to the company's own systems but to the entire organization's value chain, including interfaces to different stakeholders (Kaarlejärvi & Salminen 2018).

A key trend in digital financial management is the integration of financial management into the company's ERP. Functional integrations are seen as a necessity for the implementation of genuine digital financial management and for the optimal efficiency of operations. (Bhimani & Willcocks 2014; Kaarlejärvi & Salminen 2018, 42) On the other hand, changes in an ERP system and financial management systems can be costly and laborious projects, so modern automation tools that collect data efficiently from different sources and can operate on multiple systems simultaneously can be another approach to automating information flow between systems and processes. (Bhimani & Willcocks 2014; Kaarlejärvi & Salminen 2018, 45) The flow of data in digital financial management processes and reporting is simplified and illustrated below in the Figure 5.

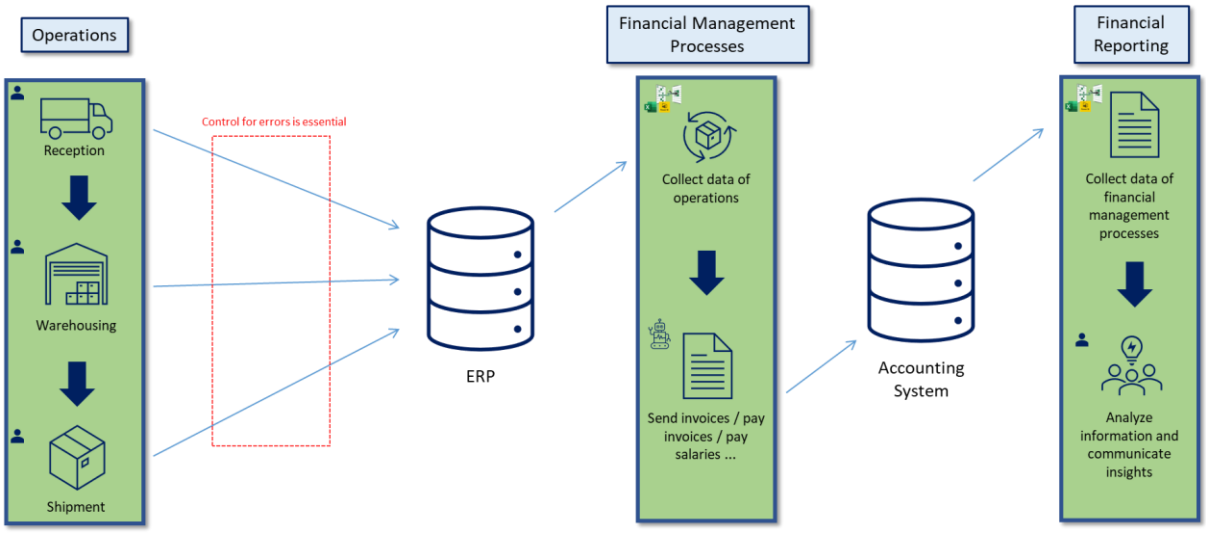

Figure 5 Data flow in Financial Management Processes and Reporting

Although financial management systems are increasingly in a fully digital format, they are rarely perfect. Different companies have different requirements and needs for, among other things, the functionalities of ERP and financial management systems, and a system with sufficient functionality and flexibility is a necessity as a basis for digital financial management and automated data flow. In reality, many companies have old-fashioned and cumbersome ERP systems with financial management functionalities that require the integration of separate

financial management applications and programs. (Kaarlejärvi & Salminen 2018, 36) Thus, digitalization itself has not solved all the shortcomings related to financial management systems and processes, and in addition to new and fine technologies and integrated systems, benefiting from digital financial management requires foresight management and business development skills, because without a well-functioning foundation and purposeful development, new technologies alone cannot create added value for the business. Even if possible, automating a bad or unnecessary process is not only pointless, but it also consumes a lot of resources without bringing the desired added value to the table (Florea 2017).

In summary, in pursue of intelligent and automated financial management, all processes and systems must be designed purpose-drivingly to be consistent and compatible. (Moayed 2020; Kaarlejärvi & Salminen 2018, 42) Similarly, even if processes are developed intelligently and a clear vision for development is seen, but the benefits of modern automation technologies such as robotic process automation and query and report automation are not reaped, enormous potential is left untapped. The optimal situation is therefore to combine business understanding and strategy with suited process development practices and the utilization of right technologies. (Moayed 2020)

2.2 Lean thinking in Financial Management expert work

Lean is a popular management philosophy and operating model derived from the tools and best practices of continuous improvement in the 1980s by Toyota. The principles of the Lean operating model focus on improving the flow efficiency of a process, increasing the value the customer receives from the product, and reducing process waste. In addition, it aims to create a culture of continuous improvement in the organization, in which each of its members acts in accordance with the principles of continuous improvement. (García-Alcaraz, Oropesa-Vento & Maldonado-Macías 2017, 1)

Lean thinking was originally developed to improve the operations of production companies, but its principles have now begun to be widely used in the development of expert work and service business as well, where the main goals of Lean principles are, just as in the production business, to maximize the benefit experienced by the customer and eliminate waste, i.e., work

that does not add value from the customer's perspective but consumes the company's resources. (Gupta, Sharma & Sunder 2016, 1046-1047)

In other words, the goal is to remove non-value-adding work, make value-adding functions more efficient, and to invent new methods to maximize the added value as efficiently as possible. Lean methods can be used to pursue improvements in quality as well as time and cost savings, with the goal of continuous improvement by challenging existing practices and measuring and providing more effective practices. (Jones & Womack 2016; Burgess & Radnor 2013; Barraza, Smith & Dahlgaard-Park 2009; Dahlgaard & Dahlgaard-Park 2006) In short, Lean thinking helps produce more while doing less work at the same time (Womack & Jones 1997). According to Lahti and Salminen (2014), digitalization enables more and more effective use of Lean practices, where increasingly intelligent technologies and solutions are available for the continuous development of processes, the elimination of unnecessary work steps, and the automation and standardization of remaining work steps.

In this study, financial management functions are considered as internal services of a company, the purpose of which is to implement the operative management of the company's monetary resources and to provide related reporting and strategic support to the company. Thus, the standardization, improvement, and automation of these functions utilizing the principles of Lean are among the objectives of this work. As physical production and service production differ significantly in nature, although the thinking and purpose of Lean practices are the same, they need to be adapted to suit the service sector, and in this case Financial Management expert work in particular (Jones & Womack 2016; Gupta, Sharma & Sunder 2016, 1046-1047).

In order to achieve best benefits, the entire organization should be committed to Lean thinking, regardless of the size of the company. Small companies need to do so because of their limited resources, and large companies need to do so because they have unnecessary complexity due to large size that needs to be eliminated before more agile competitors steal their markets in a rapidly evolving competitive environment. (Cunningham & Fiume 2003, 10, 14) Companies' current processes are often the result of layer by layer built management and IT controls, which largely explains their poor performance and rigidity. Therefore, companies must first identify and eliminate waste, and improve processes as much as possible, and only then determine how

information systems and intelligent technologies will be harnessed to continue the Lean process. (Ballén, Chartier, Coignet, Olivencia, Powell & Reke 2019, 57; Cunningham & Jones 2007, 130)

Office information work processes tend to have a higher proportion of non-value adding (NVA) activities than physical production processes because they are rarely directly linked to customer value creation, or there may be multiple customers and work due dates. One reason for this is the mindset that people should stay continually active to be useful to the organization, in which case they need material and information from their co-workers, which in turn increases waste by causing interruptions and reducing productivity. (Martin 2008,190; Katko 2013, 37) Office work is often performed in information systems, which makes processes and information flow difficult to understand, extends lead times, reduces productivity, and raises transaction costs (Martin 2008, 143; Katko 2013, 36). The information flows in the information system in an intangible form, such as transactions, or in a physical form, such as orders, invoices, and various sum lists produced by the information systems. Data flows often occur between many departments and many processes require a lot of data collection and processing before the data can be analyzed because the data is not in a usable form as such or is scattered across several different systems. (Martin 2008, 143; Keyte & Locher 2016, 5)

It is often difficult to predict the variability of office work because the completion times of the work vary according to the degree of complexity of the work. In financial management, prioritization is particularly challenging at the turn of the month because the processes are interdependent, for example, the main accounting cannot be finished before the completion of its sub-processes. (Katko 2013, 36-38) There is always a queue of work before a bottleneck in a process, and the post-bottleneck phases are seasonally idle or slower than they could be because they expect work from the bottleneck. (Modig & Åhlström 2018, 38; Martin 2008, 85-86; Torkkola 2015, 99) In order to complete the reporting of the turn of the month on time and of sufficient quality, employees may have to work overtime, or if the company has enough resources to produce reports on time, it may mean idle employees during the rest of the month. (Torkkola 2015, 198; Cunningham & Fiume 2003, 41) A flexible working time system may help in hiding the problems and enabling goals to be achieved even if the solution is not optimal and waste is produced (Rother 2011, 88).

One of the cornerstones of Lean thinking is also to reject the idea that every step of the process should be optimized. Instead, the goal is to optimize the efficiency of the process as a whole from start to finish by using analyzes to find bottlenecks that can be addressed to improve the speed or quality of the whole process. With the principle of continuous improvement, after having completed the discovered development steps, the processes can be re-examined and focus can be shifted to the next biggest challenge, while maintaining the benefits of previous development cycle. (Shalloway, Baver & Trott 2009, 14)

According to Torkkola (2015), most of the limitations of a system are its rules, policies, and especially people's biases, beliefs, and practices. Standardization ensures that work is always done in the same way by minimizing variation between performances. The process should first be simplified and reorganized, after which it can be standardized. Standardization, simplification, and minimizing the number of errors maximize the added value of the process. (Martin 2008, 30, 82; Torkkola 2015, 104)

The degree of standardization of a process is directly related to its stability (Martin 2008, 38). In an unstable process, more workers are needed to reach the target level compared to more stable processes. However, increasing the amount of workers also increases the instability of the process, because working patterns vary between individuals and intermittent idleness increases the amount of waste as well as the production of waste, such as interrupting co-workers. (Rother 2011, 271; Cunningham & Fiume 2003, 41) Thus, eliminating a bottleneck by increasing resources or speeding up work only causes the bottleneck to appear later in another place, and waste cannot therefore be eliminated effectively without proper process development efforts. (Modig & Åhlström 2018, 38)

2.3 Lean Six Sigma in Financial Management process development

Six Sigma is an operating model that seeks to develop processes using established tools and working methods systematically and consistently. It is a customer-centric quality improvement system that aims to achieve a near-perfect process that works without deviations. The model utilizes statistical methods to reduce and even eliminate process variability altogether. It was developed in the 1980s by Motorola as a counterpart for production and quality improvement

methods developed by the Japanese. (John, Meran, Roenpage & Staudter 2008, 8; Kumar, Crocker, Chitra & Saranga 2006, 9)

Among consumer electronics manufacturers in the 1980s, it was widely believed that making excellent quality did not make economic sense. The Six Sigma philosophy developed by Motorola, on the other hand, was based on achieving lower production costs by efficiently manufacturing high-quality products. Motorola also strongly believed that customer satisfaction means higher profitability. (Taghizadegan 2006, 1) The Six Sigma model evolved as Motorola tried to solve the reliability problems of its production lines and the quality problems of the finished products. Motorola found that a more consistent quality of end products is proportional to variations in production line processes. In other words, quality problems were found to be mainly due to unexpected variations in the production process. (Kumar et al. 2006, 9)

The principles of the Six Sigma operating model are based on statistical process control, identification of different issues, and control of the product design process. Statistical methods of process management and analysis are used to study and detect process deviations, their root causes and to look for improvement measures to improve quality. Reducing the number of deviations can dramatically improve a company’s productivity and quality. (Taghizadegan 2006, 1-2)

The main principle of the model is to reduce process variations and improve the quality of commodities relative to the goal. Variation is reduced by examining the causal relationships that affect the process and by making changes to the variables that affect the output. Reducing variability also reduces waste and this results in increased capacity. Variation also causes errors that cause defects and defects again cause waste. It is very important for the realization of the objectives of the model that the process to be improved and its outputs are measurable. In addition, it must be possible to define clear indicators for the target and results of the improvement measures. (Chiarini 2013, 6)

Systematic analysis of the process and identification of deviations significantly increase employees' knowledge of the company's processes, business, and customer satisfaction. The

Six Sigma model also includes optimization methods, error prevention, and waste reduction. It can also be defined as a model that continually improves process performance, product quality, and maximizes business productivity. (Taghizadegan 2006, 1-2)

As the principles of Lean became popular in the early 1990s, ideas arose to combine the best aspects of two systems of continuous improvement. Six Sigma was based on reducing process variability and improving quality, while Lean approach focused on improving process flow efficiency and lead times. Lean Six Sigma (LSS) is a methodology that combines the Lean mindset and the Six Sigma mindset into a framework, the main purpose of which is to systematically reduce waste and variability, for achieving development in processes. In addition, the tools in the Six Sigma model and its DMAIC cycle focused only on process repair, while the tools in the Lean model also focused on the seamless operation and flow between multiple processes. Combining these two approaches resulted in a system focused on improving process quality and flow efficiency using defined tools. The Lean Six Sigma model and its main principles can be described as a model that aims to deliver flawless products or services to the customer in the right time and at a quantity that the customer needs, using optimal amount of the company's resources. (John et al. 2008, 8; Muralidharan 2015, 12)

In short, in LSS, Six Sigma focuses on reducing variability and Lean focuses on eliminating different types of waste and combining both of these principles makes the methodology very effective in achieving performance improvements in process efficiency, profitability, and customer satisfaction. (Shokri & Li 2020; Vivekananthamoorthy & Sankar 2011; Pyzdek & Keller 2003) A summary of the Lean Six Sigma model is illustrated below in the Figure 6.

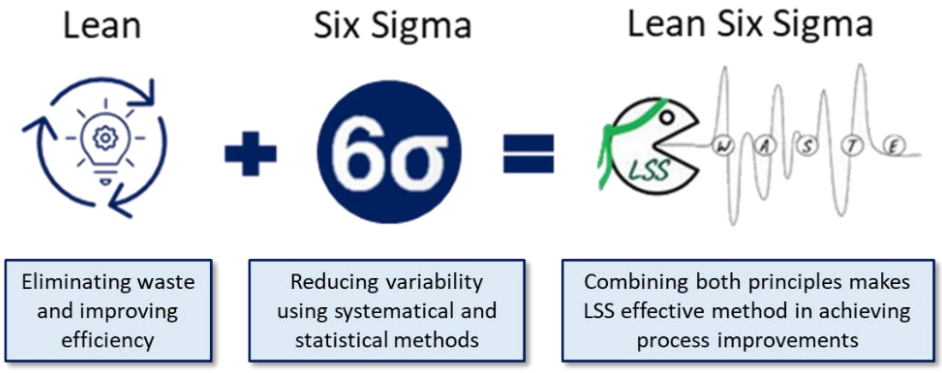

Figure 6 The Lean Six Sigma model

In Lean Six Sigma development projects, the DMAIC method is often used as a systematic problem-solving model. The model includes several mathematical, statistical, technical, and administrative tools to improve process performance. (Kumar et al. 2006, 355-356) DMAIC is an abbreviation of the words Define, Measure, Analyze, Improve, and Control. The method is used to optimize existing processes in an unbiased, systematic, and fact-based manner. The different phases of the DMAIC process are illustrated below in the Figure 7.

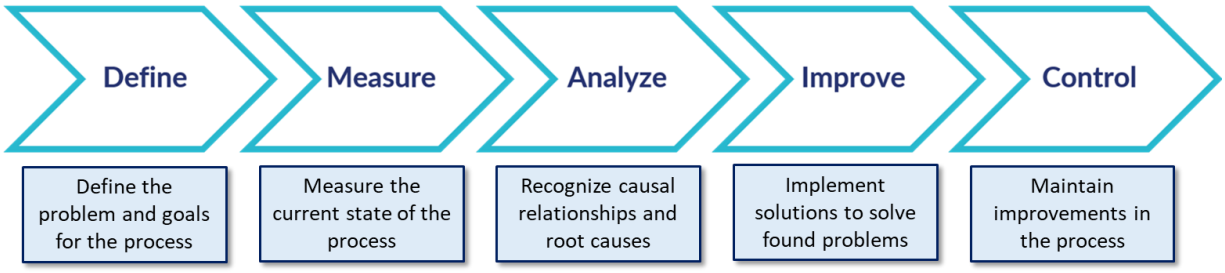

Figure 7 The DMAIC problem solving process

In the figure above, the DMAIC process has been described as a linear process for simplicity, but in reality, the continuous development can be run as a circle and after the control phase the cycle is started over from the define phase. The first step in the DMAIC cycle is problem definition. During the define phase, it is determined which part of the process needs improvement measures, the goal of the project is decided, and the topic is limited to a reasonable size. The project should be oriented to the customer's needs and the goal should be to improve the value the customer receives from the company's products or services. The goal can be an organization-wide strategic goal, or it can be, for example, to improve the quality of the products of a production line compared to the quality goals desired by the customer. In this phase, after the problem is identified, the project team is selected, and a person responsible for the project as well as other necessary resources are defined. (Chiarini 2013, 6-8; Kumar et al. 2006, 355-356)

At this stage, for example, the SIPOC method can be used to describe the main features of the process, which makes it possible to easily identify how the product is processed during the process. The SIPOC analysis is a flowchart showing relationships between the process suppliers

(S), inputs (I), process steps (P), outputs (O), and customers (C). (Chiarini 2013, 6-8; Kumar et al. 2006, 355-356) The SIPOC method is illustrated below in the Figure 8.

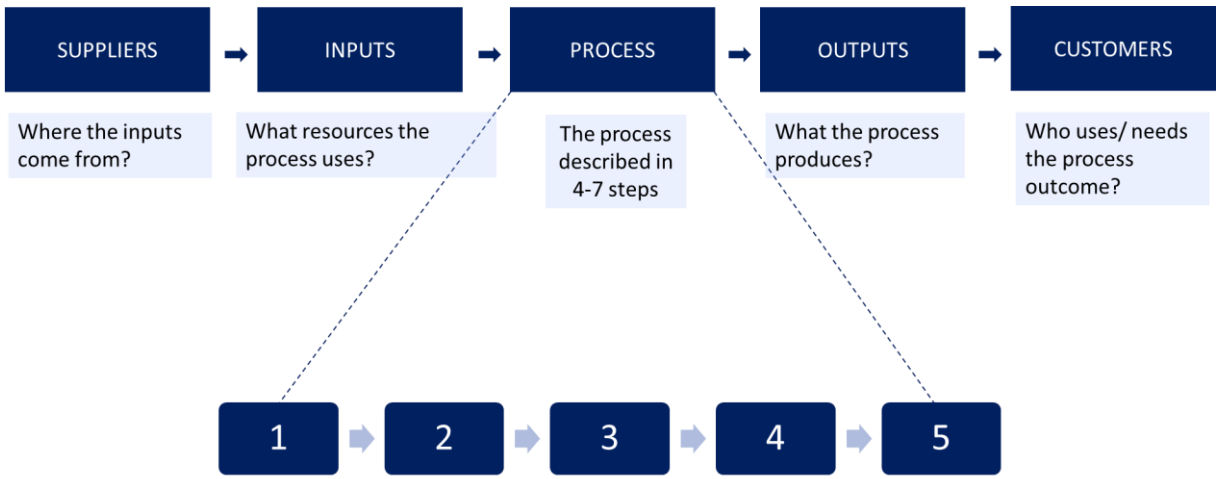

Figure 8 SIPOC analysis

SIPOC analysis helps to understand the purpose and requirements of the processes, and at the same time it helps to rethink the ways in which the process steps are performed, as it keeps the process steps at a high enough level so that precise work step-level biases can be disregarded. In the definition phase of the DMAIC cycle, the description of the process is essential for the success of the project. By describing the process, the purpose is to identify the linking of customer requirements to the process parameters and the connection of the value created by the process to the product passing through it. It is a good idea to make a description of the process as a graphical model that makes it easy to observe the flow of products through the process. The advantages of the SIPOC process description method are its focus on customer requirements and their linking to process key inputs and steps. (Aartsengel & Kurtoglu 2013, 520; Muralidharan 2015, 104)

The second stage of the DMAIC cycle measures the current performance of the process selected for improvement. The selected metrics can for example measure the critical quality of the product as well as the cost of manufacturing the product. After selecting the appropriate metrics, data on the operation and performance of the process is collected and used to monitor the progress and results of the improvement project. In addition, the process should seek to measure those factors that suggest a potential problem limiting its performance. In the measure phase,

the most important factors to be performed are the selection of appropriate metrics, the collection of data relevant to the project, and the analysis of the process and its performance. (Kumar et al. 2006 355-356; Muralidharan 2015, 124)

In any performance improvement project, it is very important to understand the phenomena that affect the process. The third stage of the DMAIC cycle analyzes the reasons why the process does not achieve its objectives. For the analysis of the state of the process, it is good to use, for example, flow diagrams, which make it easier to understand the dependence and causal relationships of the different stages of the process. In the analyze phase, the flow chart greatly facilitates the understanding of the problem and the dependencies. Flow diagrams and measurement results are used to determine the root causes of performance deviations, factors affecting performance, factors causing variability, and the relationships between them. (Chiarini 2013, 8; Muralidharan 2015, 237-238)

Once the first three steps of the DMAIC cycle have been completed, the root cause of the problem and possibly the idea of how to solve detected problems begin to emerge. In the fourth, improve phase of the cycle, a concrete solutions to the identified problems are planned. Remedial measures improve the performance of the process and make the product of the process more competitive by reducing quality deviations and other production disruptions. Remedial action should focus on addressing the root causes of the problems. The main measures in the fourth phase of the cycle are the development of remedial measures, their prioritization, and their implementation, starting with the most important and urgent measure. (Kumar et al. 2006, 359)

Once the process that is the subject of the improvement project has been analyzed, the main factors behind the variations have been analyzed, and corrective action has been taken, it is very important to monitor that the process performance is improving, and the changes are permanent. The performance of the process and its change from baseline can be monitored using the same performance metrics used in the second phase of the DMAIC cycle. The advantage of using the same performance measures is the comparability of the measurement results, which makes it easier to detect the change. The main goal of this last phase, the control phase, is to ensure that the improvements achieved do not disappear over time and that the operation of the process

does not return to the state it was in before the improvement project. The control phase of the cycle should also ensure that the improvement project is properly documented. (Kumar et al. 2006, 359; Muralidharan 2015, 425-426)

Once a good overview of the process and its problems has been obtained and solutions to the problems and their root causes have been found, modern automation technologies can be used to further streamline remaining, valuable but repetitive work, further helping to reduce process variability and reduce the time required for repetitive manual work. In addition, when the root causes of the process problems have been addressed in advance and, for example, the data utilized by the process has been made as standardized as possible, it is possible to build reliable and functional automation. Furthermore, when process development efforts are done and sufficient understanding of the process has been created before automation, cumbersome solutions are not developed to simple problems and excessive complexity is already removed so that unnecessary non-value-adding functions are not automated. (Bell & Orzen 2016, 5)

2.4 Query and Report Automation in standardizing and automating data processes

Today, with companies having access to a huge and ever-increasing amount of data and information, leveraging it has become one of the key challenges in creating a competitive advantage and supporting company operations. Information is obtained from both the company's internal information systems and external information sources, and it is challenging to effectively manage and find ways to leverage all of this information to support operations and decision-making.

In order to make the right solutions for a company, it is essential to find the right kind of information from large data sets and to process and utilize it effectively. Through skillful knowledge management, a company creates the conditions for successful business in today's dynamic business and competitive environment and information society. In today's digitalizing world, technological know-how and finding new ways of working and utilizing developing technologies play an important role in being able to operate competitively.

This challenge is continually sought to be answered by finding and developing tools and methods to be able to harness the power of data in companies' operations. For example,

different databases and various applications for data analyzing, modeling and optimization, as well as applications and methods for collecting data have become important part of the operations of all companies, regardless of industry. Microsoft has created multiple data tools in order to address this problem, and for example Power Query, Power Pivot and Power View in Excel and Power BI are powerful tools that are trying to combine best practices in data collecting, processing, analyzing and visualization to help organizations make more and better data-based decisions.

With Power Query, data can be retrieved and combined from different sources and formatted to the desired format using an easy-to-use user interface in creating the queries. Power Query is based on the M query language. It is possible to use Power Query without knowing the M query language, but many of the more advanced features of the M language are not available through the graphical user interface alone. Once the data is collected from multiple sources and processed into the desired format, the query can be scheduled for automatic refresh, or it can be refreshed with just one click when needed instead of collecting and processing the data manually every time. (Rad 2017, 27-28) The Figure 9 below presents the Power Query interface in Excel.

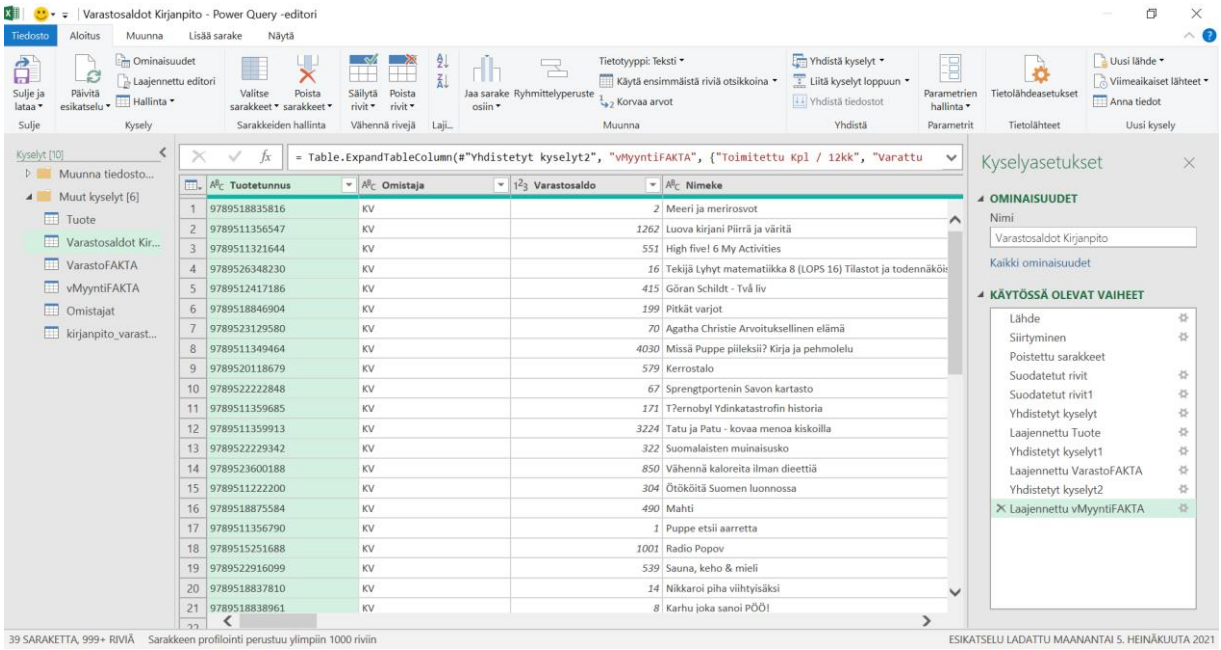

Figure 9 Power Query interface for query building

Power Pivot is a data modeling tool. In Power Pivot, you can create connections between data that is collected with Power Query, creating a data model that can be updated automatically. In addition to being able to load data in the model, you can create new calculated columns and measures from the data, which enables creating new valuable insights. Power Pivot is backed by the Data Analysis Expressions (DAX) language. Power Pivot works with in-memory technique that is based on indexing, which allows for fast response times in loading the queries and analyzing the data in addition to small file sizes. Furthermore, a data model that has been created once can be utilized in multiple different Excel or Power BI reports, so not everyone in the company has to have the skills of creating these models, and all of the reports utilizing the same model will have the same information as a basis while the automatic refreshing keeps the reports up to date. (Rad 2017, 29-30)

The above components can be used individually or in combination in Excel. Also, the Power BI Desktop combines Power Query, Power Pivot, and Power View into one entity, where a collection of software services, applications, and integrators work together to turn data from different data sources into consistent, visually in-depth, and interactive insights and reporting views. With Power BI, one can easily connect to data sources, visualize the data, and share it with selected people in the organization. (Microsoft 2021) In some use cases row-level data loaded into Excel can be useful and it can be used, for example, as a structured data basis for a robot in a process. However, in many use cases a visually easy-to-interpret, interactive and easily shareable report may be a better solution for understanding and sharing insights of the data. This is why it is so powerful to be able to utilize the same data tools and created data models in both Excel and Power BI. The Figure 10 below presents the automated query and reporting entity that can be created using these tools.

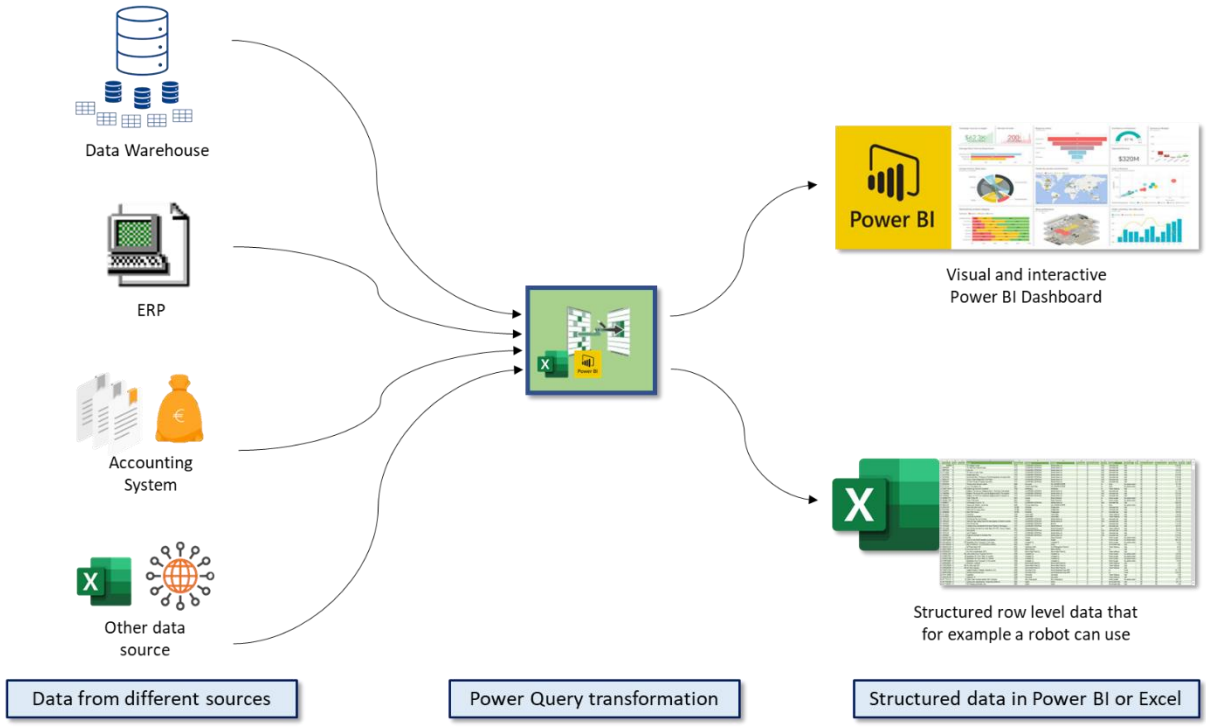

Figure 10 Query and Report Automation with Power data tools

Downloading and using the Power BI Desktop application is free but sharing reports within your organization requires you to purchase a paid license for the report distributor and report user. There are also other benefits to the license and there are different types of licenses for individual users and organizations. (Microsoft 2021) However, this work does not present licenses in more detail. The great advantage of Power BI is its versatility, since it allows one to create analyzes easily without writing a single line of code, but when needed, demanding use can take advantage of the M query language and DAX analysis language to meet the most demanding data needs. (Rad 2017, 27-34)

Combined data from several different systems in one place provides decision-makers with comprehensive information and enables them to understand the whole. In particular, the ability to take into account data outside the company's systems, i.e., the ability to monitor the operating environment, adds value to decision-making. Using a single data model that combines several different data sources also allows for easy data sharing. (Gatsheni & Khumalo 2018; Kohtamäki 2017)

Traditionally, management accounting tasks have been described rigid and have focused on describing the current situation based on historical data, producing figures and reports. This model is changing to a more proactive approach where accounting is expected to produce information to support management decision making. As a result, accounting functions have shifted to strategic decision-making, which produces value-adding information for management and other organizational use. (Appelbaum, Kogan, Vasarhelyi & Yan 2017) Knowing the key performance indicators (KPI) and figures is still, of course, an important task for accounting, but just as important, if not more important, is knowing the causalities behind these numbers. Management accounting should therefore be able to look at the factors that affect, among other things, revenue, sales, operating profit, margin, and other measures affecting these key figures. (Kohtamäki 2017)

When the role of accounting is to produce forecasts and analyzes according to management needs, the data required for this should be readily available from the systems. (Appelbaum et al. 2017) Therefore, reporting tools and their use is also a key part of management accounting work. The Power BI tool can be used to create personalized reports for different levels and roles of management so that they can be presented with the most relevant information according to their needs. Users can also create their own reports very easily with these tools, when special skills were previously required for creating this kind of reporting. Good visualization of data is also very important in reporting so that the information can be understood as well as possible, which is also a function in the Power BI tool. (Appelbaum et al. 2017)

In addition, the automation of queries and reports standardizes information and its processing, as the risk of different interpretations or processing is reduced when reports and data models are not rebuilt at every turn but are always ready to use. In other words, if the reporting is done by rebuilding the reports, for example, on a monthly basis, possibly by different people, the problem is the consistency of the reports and key figures, as when there are several report authors, problems may arise from different ways of interpreting the available data and problem.

In particular, queries for ad-hoc needs, for example for sales or shipments between different time periods, customers, or distribution channels, can vary depending on the author of the report and the potential for errors increases when retrieving data manually from multiple tables with

the need for different limiting and filtering of the data. This complex and non-standardized way of reporting is illustrated below in the Figure 11.

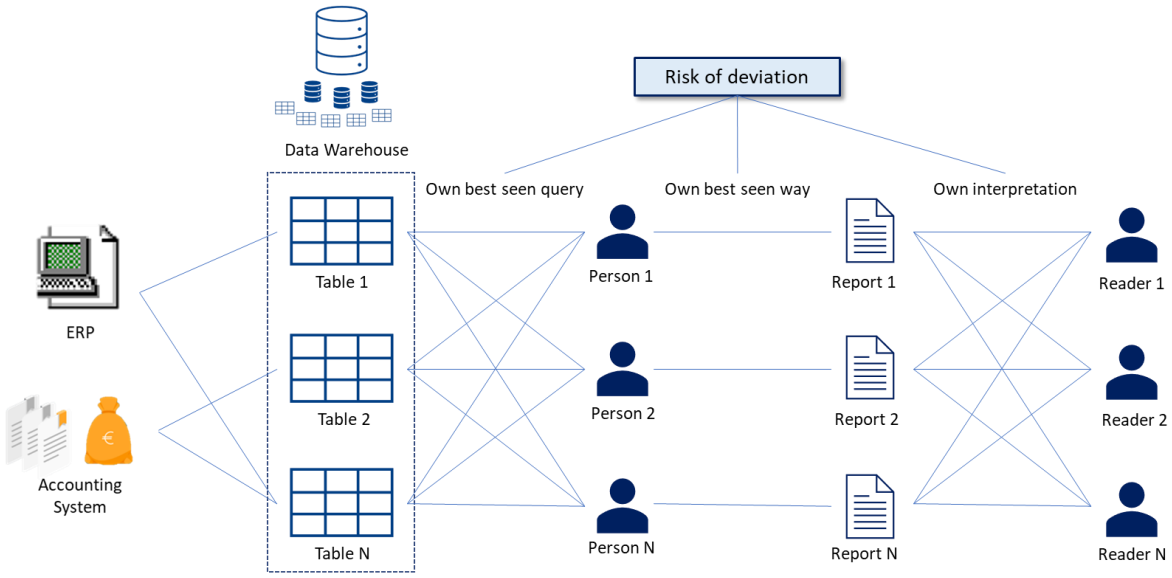

Figure 11 Manual and non-standardized reporting

Instead, the goal of reporting should be to make information and reports available in one place so that all report authors and readers have a consistent understanding of what the reports and information contain, so that reports allow stakeholders to easily draw conclusions for decision-making.

To achieve this goal, for example, the Power BI tool presented above can be used, where data can be compiled from several sources into unified, automatically updated data models, on the basis of which the data for reports are obtained. The Power BI tool also enables creating visual and interactive reporting views, which can be shared in workspaces accessible in a web browser with users own credentials, and reports shared here can be viewed anytime on a computer or mobile device. This automated and standardized way of reporting is illustrated in the Figure 12.

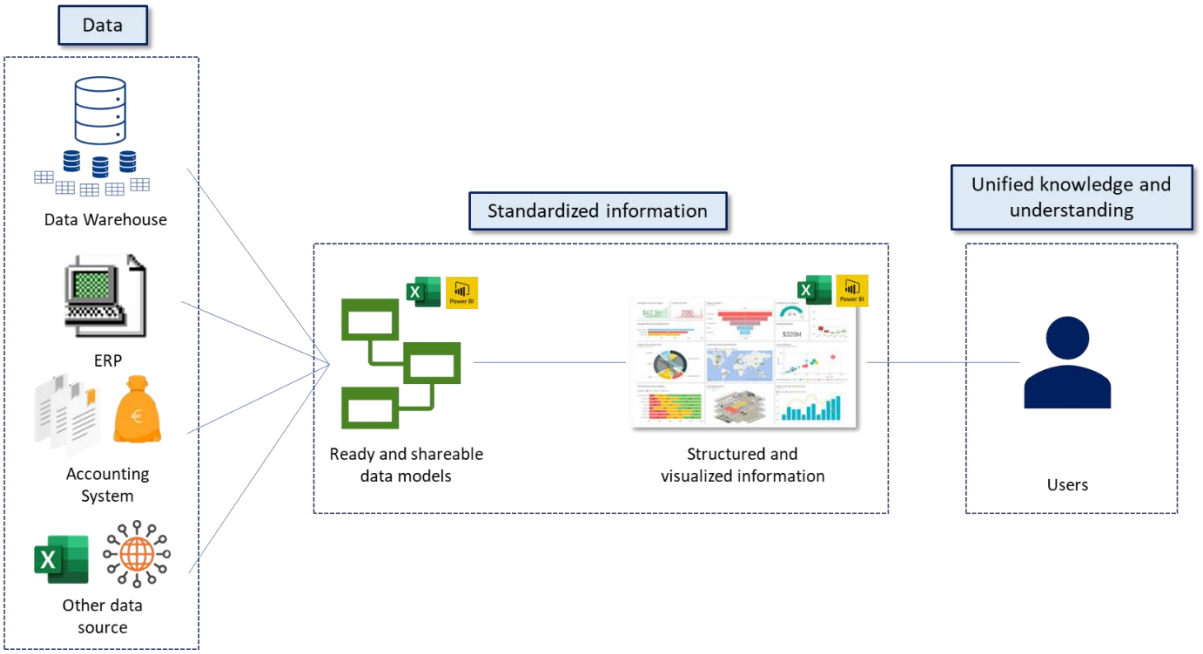

Figure 12 Automated and standardized reporting

The automated reports are consistent, visual, interactive, and easy-to-share dashboard views that make it easy to read data at a glance and categorize, drill down, and compare data across different dimensions with a few clicks. As previously discussed, consistent and ready-made data models in addition to consistent visualizations also reduce the number of manual errors, divergent interpretations, and inconsistencies, leading to more consistent knowledge and understanding within the organization.

On the other hand, the more automatically information flows through systems and software, the more important the accuracy of the information at the source of the data becomes. For example, manual entries into an ERP system without error checking are a risk, as this erroneous information easily flows through the whole automatic process leading to erroneous conclusions in the decision-making. For this reason, among others, in a data-driven process and organization, focusing on data quality and validity is the foundation of everything.

2.5 Robotic Process Automation as a Financial Management tool

Robotic Process Automation, often abbreviated RPA, refers to software technology for automating business processes in enterprises. With the help of software robots, companies have sought to automate various routine work tasks, streamlining and optimizing their processes, and thereby achieving cost savings. The operation of software robots is based on them strictly following certain rules and logic within the limits defined for them by humans. Software robots are not physical robots, but software systems that mimic the work that humans do on a computer and perform the work on behalf of them. (Zhang & Liu 2019; Boulton 2017; Willcocks, Lacity & Graig 2015a)

Software robots are able to log in to applications and systems, using credentials created for them, and perform operations independently, such as transferring data from e-mail and spreadsheets to ERP and CRM systems, while possibly further processing the data by for example calculating, filtering, or aggregating the data based on set rules. The log files of the systems used by the robots show information about the activities they have performed, which makes it easy to monitor the compliance of software robots with their operating instructions and to detect and address possible fault situations. (Madakam, Holmukhe & Jaiswal 2019; Kaarlejärvi & Salminen 2018; Hallikainen, Bekkhus & Pan 2018; Passy 2017; Willcocks, Lacity & Graig 2015a) Kaarlejärvi (2017) describes a person as the supervisor of a software robot and emphasizes their role as a setter of its rules and boundaries. The error made by the robot is not due to the robot itself but to the fact that the human originally gave the wrong command, incomplete logic, or inadequate error handling to the robot. (Ling, Gao & Wang 2020; Kaarlejärvi 2017)

Robotic Process Automation can be seen to have developed on the basis of macros and other command based languages that have been in used in automation for decades. However, RPA differs from other forms of automation in that software robots are integrated to the information systems through the user interface (UI), i.e., the front-end, while traditional automation utilizes mostly the back-end functionality of the information systems. RPA is called a lightweight IT system because it runs on top of other systems and its exploitation does not require the creation, replacement, or further development of new system platforms, as the technology is based on the automation of user interfaces. (Penttinen, Kasslin & Asatiani 2018; Bygstad 2017) Working

through the front-end means that software robots perform tasks similarly to people, meaning that the robots respond to events on a computer screen by repeating precise and rule-based steps on the user interface instead of communicating with the system through the software interface, like in traditional automation, that can be called heavyweight IT. (Moffitt, Rozario & Vasarhelyi 2018; Penttinen, Kasslin & Asatiani 2018; Bygstad 2017; Asatian & Penttinen 2016)

According to Lacity & Willcocks (2016), it is precisely because of this feature of being able to utilize the UI of multiple applications simultaneously, that the application of RPA is often easier, lighter, and less expensive to implement compared to traditional automation. Another significant difference compared to traditional automation is that implementing RPA does not require as much actual programming skills or IT knowledge as traditional automation. Instead, the utilization of RPA is seen to require mostly user knowledge of the process as well as knowledge of the user interface in addition to the traditional logical understanding associated with programming. RPA can be seen as one tool of automation that does not replace traditional automation solutions but allows them to be supplemented and makes lighter automation cases more approachable and cheaper for companies. (Willcocks, Lacity & Craig 2016; Willcocks, Lacity & Craig 2015a; Penttinen, Kasslin & Asatiani 2018)

However, it is important to understand that not all processes are suitable for automation by RPA. When considering process automation, companies need to consider various process features that favor or complicate process automation. Therefore, sufficient time must be spent on defining, analyzing, and designing the RPA automation efforts. (Fung 2014) Many key criteria and features have been identified in the literature as to which kind of processes are best suited to be automated using RPA and in general, RPA is seen as best suited to automate repetitive as well as routine processes that are sufficiently mature, highly structured, based on well-defined rules, and do not require case-by-case creative decision-making. Also, the process to be automated must be easy to define and have a clear beginning and ending. (Ostdick 2016; Lacity & Willcocks 2016; Asatiani & Penttinen 2016; Davenport & Kirby 2016; Willcocks, Lacity & Craig 2016; Fung 2014; Fersht & Slaby 2012)

According to several studies, a key criterion for automating a process using RPA is related to the number of its events. The more transactions involved in the process, the more profitable the

automation of the process can be, as more manual work is replaced by automation. Thus, processes that are performed at sufficient frequency and regular intervals, or for which a significant number of tasks or transactions are required, are suitable for RPA. Automating such processes often also yields the most significant cost savings. (Ostdick 2016; Lacity & Willcocks 2016; Asatiani & Penttinen 2016; Willcocks, Lacity & Craig 2016; Fung 2014; Fersht & Slaby 2012)

On the other hand, some studies also emphasize that it may make sense to automate business-critical processes even if they are smaller in number of transactions or events. Due to this contradiction, it is therefore important to estimate the costs of these processes as well. Utilization of RPA is profitable if the total cost of automation is estimated to be lower than the cost of doing the work manually. Companies should therefore first understand the cost structure of the current process, compare it to the estimated costs of RPA, and calculate the return on investment achieved with RPA. On the other hand, even if costs are not significantly reduced, but the quality of work is improved or a person can be freed up for a more creative and value-adding task thanks to robotics, automation can be profitable. (Ostdick 2016; Asatiani & Penttinen 2016; Fung 2014; Fersht & Slaby 2012)

Often, processes that require employees to access multiple systems simultaneously to perform work tasks are also seen as potential targets for RPA automation, as using multiple systems simultaneously can lead to increased human error, reduced performance, which can at worst lead to significant costs to the company. (Fung 2014) In addition, the automation of processes that utilize multiple systems by means of traditional automation often becomes a cumbersome and expensive project, as the systems may have to be modified. (Penttinen, Kasslin & Asatiani 2018; Fersht & Slaby 2012)

The more stable the operating environment of the process-related information systems is, the more efficient the use of RPA in process automation gets. According to Penttinen et al. (2018), in particular, the stability of the user interface is an important criterion for the utilization of RPA. In other words, the software robots can only operate in a predetermined IT environment, i.e., systems that remain unchanged when performing the tasks. In addition, the stable environment of information systems means that the information systems related to the process

will remain as unchanged as possible also in the future, as changes in information systems or workflow also require remodeling of robots. (Aalst van der, Bichler & Heinzl 2018; Penttinen, Kasslin & Asatiani 2018; Asatiani & Penttinen 2016; Fung 2014; Fersht & Slaby 2012)

It is important that the processes to be automated are sufficiently standardized and stabilized to make process automation profitable. (Moffitt, Rozario & Vasarhelyi 2018; Willcocks, Lacity & Craig 2016; Willcocks, Lacity & Craig 2015b) Automated processes should include as few exceptions as possible, because the more exceptional situations are involved in the process to be automated, the longer it will take for the process to be automated, tested, and optimized, since large number of exceptions increases the need for rulemaking as well as programming, which will impair the profitability of the process automation. (Murdoch 2018; Asatiani & Penttinen 2016; Fung 2014; Fersht & Slaby 2012) For this reason, it would be important to be able to take into account all possible exceptional situations that robots may encounter during their operation already in the planning phase of RPA deployment (Penttinen, Kasslin & Asatiani 2018). It is possible to direct exception situations to be handled by people, but when the number of exceptions is large in a process, it is not effective that a human must guide the robot at all times. As a result, processes with small amount of exceptions are seen as suitable targets for RPA automation. (Asatiani & Penttinen 2016; Fung 2014; Fersht & Slaby 2012)

In addition to the above-mentioned criteria, the easier the process to be automated can be divided into clear sub-processes, the easier it will be to set rules for the operation of the software robot. Clear and streamlined sub-processes also make it possible to set clear and streamlined rules, because the different stages of the process can be easily identified. This reduces the ambiguity associated with decisions at different stages of the process. On the other hand, a company does not need to automate the whole process at once if it gets too complex, but, for example, its sub-process or a related individual cumbersome task can be individually automated. Then, gradually increasing the degree of automation one sub-process at a time can be a good way to approach automating a complex processes. (Lacity & Willcocks 2016; Asatiani & Penttinen 2016; Fung 2014; Fersht & Slaby 2012)

2.6 Theoretical Framework

As noted previously, high-quality and standardized data and processes play a very essential role in the automation of financial management processes, supporting the need for process development efforts to ensure this quality before automation can begin to be implemented. In addition, to avoid unnecessary work, save resources, and create sustainable automation solutions, it is important that processes are as sensible and appropriate as possible before implementing automation. (Moayed 2020; Moffitt, Rozario & Vasarhelyi 2018; Lacity & Willcocks 2016)

According to Bell & Orzen (2016), the inclusion of automation and technology at too early stage in the process development leads to the development of cumbersome solutions to simple problems, where the excessive complexity of processes and the automation of non-value-adding functions feed each other. Furthermore, in many processes, in the past the goal has been to make human work easier, but when the goal is to prepare a process for automation, the optimal approach is very likely to be different, as robots and applications are scalable in a way people are not. Automation tools, in other words, are able to process huge amounts of data, compute, and utilize complex logic while performing tasks without the fear of memory problems, exhaustion, or typos. (Moayed 2020; Lomanto 2019; Bell & Orzen 2016, 5)

Many different means and tools can be utilized to achieve the desired process development goals, and one good such process development ideology is the Lean Six Sigma DMAIC problem solving model, used for continuous development and quality improvement. After the process, its problems, and their root causes are understood and addressed, remaining repetitive but value-adding work can be sought to be automated using modern automation tools such as Query and Report Automation and Robotic Process Automation. This enables automatic data flow in financial management processes and reporting, freeing people for more value-adding information analyzing and communicating as well as problem-solving tasks. Theoretical framework combining all of the above is presented below in the Figure 13.

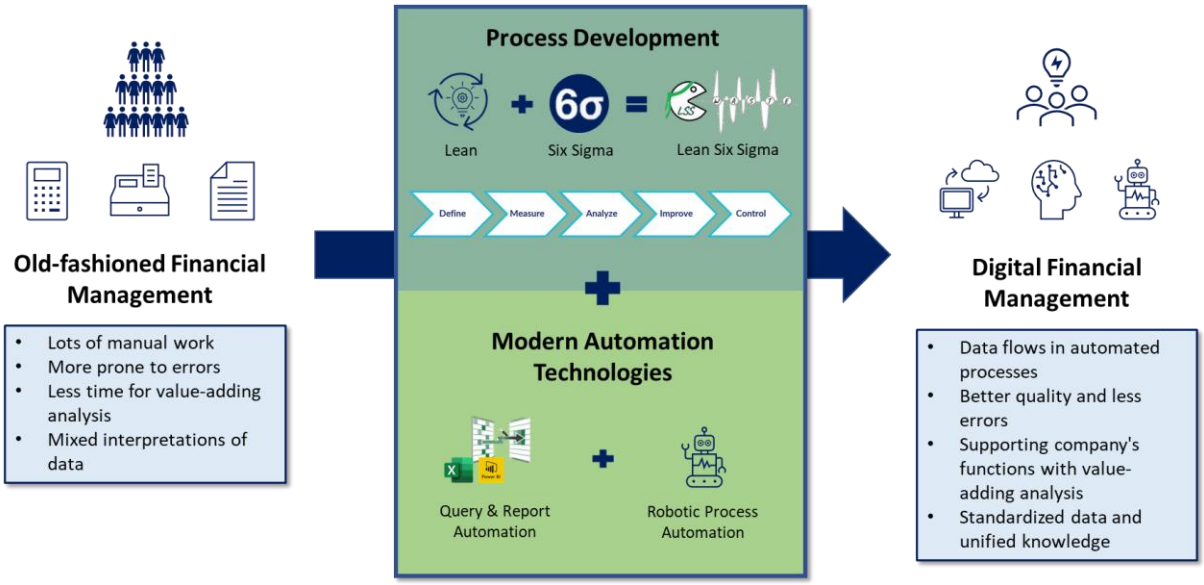

Figure 13 Theoretical Framework

3 CASE IMPLEMENTATION

This section presents the development efforts taken in the company to develop and automate a financial management process as clearly documented as possible, so that in a similar situation in another company the same efforts can be repeated, and similar results can be achieved. Correspondingly, by following these stages of the development process, the target company can proceed to the development of the next process, and thus continue to gradually increase the degree of automation in the company's financial management. At this stage of the work, various group meetings and workshops have been used to include the company's financial management experts in the development efforts, all of which will be demonstrated during this chapter.

At the beginning of the chapter, the target company is introduced, and an overview of its operating environment is created. Next, the current state of the company's financial management is presented, and understanding is created of what kind of development measures the company wants to achieve. After this, the most important processes and tasks of the company's financial management are mapped through work group work, where the company's financial management experts are guided to gather an overall picture of the key processes, their outcome, their customer, the inputs needed by the process, and the process inputs' source or supplier. This is also called a SIPOC analysis. From these processes mapped, next, the processes to be described at a more detailed level are selected using the desired criteria in order to decide which process is started to be further developed first. This is followed by the creation of an LSS DMAIC project work team consisting of a project leader (Green Belt), a financial management manager, financial management process experts, and an IT RPA expert. This group implements the LSS DMAIC cycle and automation efforts. Figure 14 below illustrates the progress of case implementation.

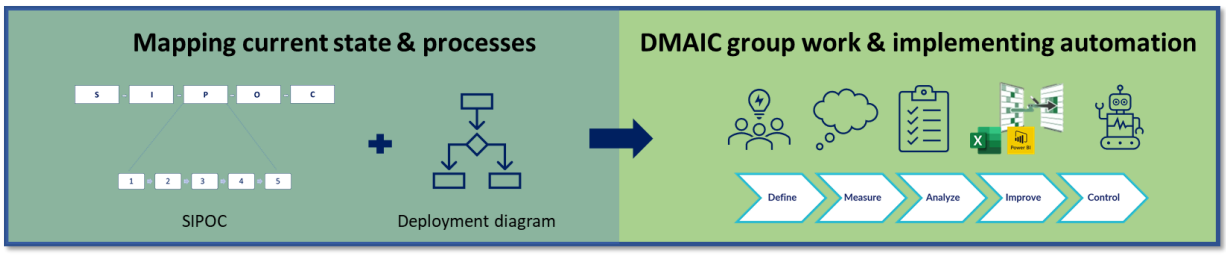

Figure 14 CASE implementation

3.1 The current state of the target company's financial management

The case company is a large logistics service company in Finland, which offers logistics services, wholesale services and digital services to, among others, book publishers, schools, libraries, and book retailers. The company has a turnover of more than 80 million euros a year and employs about 170 people. The company's business has been recently growing due to large new customers, and its operating environment is constantly changing as digitalization, among other things, shapes the book industry, and the work of financial management is increasingly important to be able to support the change. In addition, the work of financial management is complicated by the company's three different types of service business and the very different customer relationships due to the different nature of logistics, wholesale, and digital services.

In addition to the CFO, the company's financial administration employs 7 people, in addition to which one accountant is also being trained, as the chief accountant is retiring at the turn of the year. The company has gained large new customers recently, which has also increased the workload in financial administration. However, with current processes, there is so much manual work that the workload has become too large, which leads to hurry and error situations, especially during monthly shifts, and takes away all the working time from employees to cope with routine tasks instead of focusing on development efforts, root cause fixing or being able to provide valuable insights to management. However, it has been identified, that by developing processes with the help of modern technologies and thus also reducing anomaly situations, the amount of work could be handled with the same number of staff, and therefore there is no desire to cover up process inefficiencies by adding staff to the financial management.

At the same time, the entire company is strategically on the path to data-driven culture and operations, and financial management is also expected to support this knowledge management entity, meaning they are increasingly expected to be able to create value-adding data analysis in addition to producing figures and accounting. Because of these background factors, management has set the development of financial management processes as an important goal and this work will help to start this path of continuous development by documenting the development of one process and producing a roadmap that can be followed to continue increasing the degree of automation in the future.

The financial management workers use a number of different systems and applications, such as an invoice processing system, an accounting system, an ERP system, payment service system, spreadsheet software, and a data warehouse in their work, but the use of which could be significantly optimized to reduce the amount of manual work and related error situations. By focusing development resources on data quality, accessibility, automated flow, and processing with the right kind of automation tools and development efforts, people's working time can be utilized to understand and communicate information and its underlying factors. In other words, the purpose of this development is to improve working conditions, give employees the opportunity to participate in development work, improve the company's competitiveness, and do things more simply and correctly overall in the company. The Figure 15 below illustrates the development goals and the positive circle they form together.

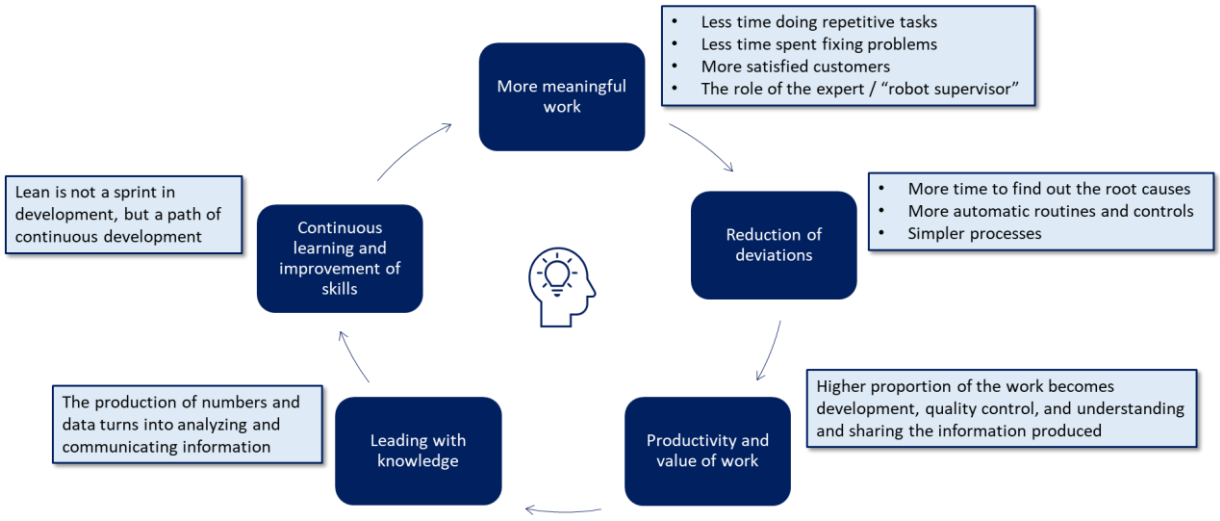

Figure 15 Goals with Lean Financial Management

As the picture shows, the goal is not a rapid development sprint, but to create a cyclic path of continuous development, where improving the quality and relevance of work by reducing manual and repetitive tasks with the help of automation creates time for more development and better understanding of underlying phenomena, leading to new learning and better knowledge management, which in turn enables quality and relevance of work to evolve further continuing the cycle. This changes the job description of financial management employees from a repetitive transaction process worker towards the role of an expert, process owner, or robot supervisor, which is why the training and development of employees in accordance with the

requirements of the new roles is a very important part of the continuous development of financial management in this company, and the planning and implementation of this will thus be focused accordingly on this work.

3.2 Prioritizing processes to be developed

In order to understand where development resources should be directed, it is important to understand the current state of operations and to be able to examine to what extent they support or do not support the desired development goals. In this case, group workshop-style meetings were used to aid in the study of the current situation. In the first meeting the topic was first introduced with a lecture-like presentation, after which financial administration employees were instructed and guided to create SIPOC process descriptions of all their key tasks.

In total, 36 different financial management tasks or processes were identified, all of which differ in importance and frequency of performing, and some of which were already decently automated or developed. Out of these, there was found to be 18 processes that are performed at least monthly and that are performed mostly manually, so SIPOC analysis was decided to be done on these 18 processes. This task of everyone creating overview on their main tasks were left as an individual assignment at the end of the first meeting, and the results were to be analyzed together in the next meeting. It was emphasized at this stage, that even if the processes contain lots of steps or even sub-processes, the purpose is to keep the illustration of the process on a high enough level, i.e., the purpose is to describe the purpose of the process steps and not their detailed execution.

Analyzing everyone’s processes in a group meeting enables everyone to get a better idea of what other people’s work includes, as well as enables better brainstorming and outside views on everyone’s work. Also, when everyone is included in the meetings, communication between people is easier and deciding which processes should be prioritized in the development is thus more transparent. Furthermore, when tools and methods for improvement are eventually found, more often than not similar steps can be taken to develop another process. In other words, people can learn new methods for developing their own work by noticing certain developments in another process.

In the second meeting, everyone presented their own SIPOC analyzes, and a discussion was held on the basis of which the analyzes were refined and the connections between the processes were sought to be understood. Based on the discussion, since all the process experts and the CFO were all in the meeting, it was easy to prioritize the five processes that needed the most development and where development could be initiated with relatively easy measures to start the learning journey by enabling everyone to have a successful experiment in developing their own process with guidance.

Responsible persons and development teams were defined for these five processes, and one of these five processes was selected for further development in this work, after which similar development measures can be followed by the other teams on the other processes. In the end of this workshop meeting, a new individual assignment was given, instructing development teams to create a Deployment diagram of the selected processes and to specify the different information systems and applications used to perform the different stages of the process. The process of prioritizing development projects is illustrated below in the Figure 16.

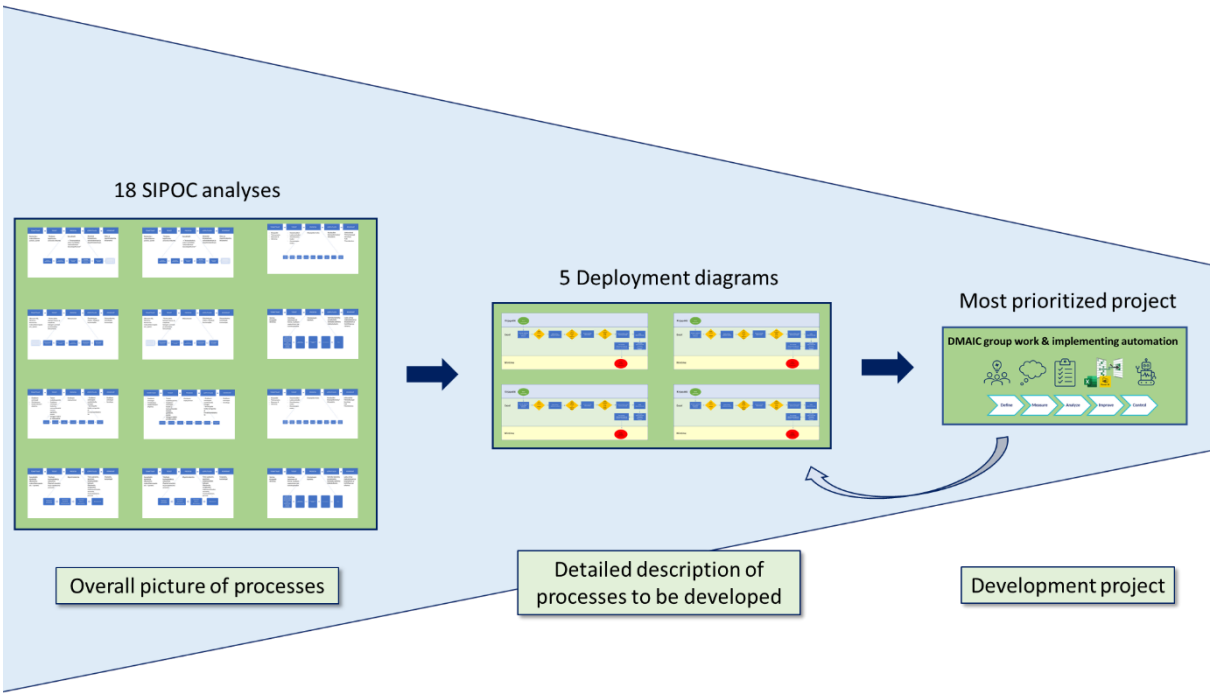

Figure 16 Development project prioritization process

On the basis of prioritization and joint reflection, the process of forming inventory levels and inventory change report for accounting on a monthly basis was selected as the process to be developed first, as the process is done completely manually and in addition to taking lots of working hours it seems to work as a good example of a financial management process where most of the manual work can actually be automated with relatively simple steps because data is obtained from the same sources every time.

3.3 Defining the problem

Due to the company's different types of service businesses and different customers, there are products with different ownerships in stock. Each month, two different inventory lists are retrieved separately describing two different warehouses. The products are physically in the same warehouse, but the warehouses are treated as their own entities in the accounting.

Processing two different inventory lists takes about 8-10 hours of working time per month. There are several different steps in processing the data to retrieve, calculate, correct, and add information. The data to be processed is obtained from different sources and the same steps are repeated every month. Corrections and additions must be made so that the listing corresponds to the actual physical situation of the inventory on the basis of which accounting and decisions in inventory management are made.

Compiling an inventory list takes up work time from other tasks at the turn of the month, which is already the busiest time in financial management and accounting. Even partial automation of creating the inventory list saves working time for other inspections and tasks at the turn of the month. In addition, with automation, the possibility of errors as well as monthly variations in the process are reduced, which further reduces the time taken to clear up possible errors.

The process is a completely manual job that can be automated with modern tools. All the information exists in the systems already, so the project aims to take advantage of modern tools to collect and process it. The goal is to reduce the working time for processing the inventory to at least half from the current 8 hours per month. The aim is to be able to adapt and apply the model in other financial management processes once the model has been found to work. In addition, when the problems of the process are studied in depth and the root causes of error

situations can be identified and solved, the aim is to further reduce the working time spent on resolving errors throughout the financial administration and the whole organization.

This chapter focuses in particular on the development of this single process, but as a whole the project provides capabilities and a model for future development by following similar development measures in other processes. To develop this process, a team was formed consisting of a project leader (Green Belt), a CFO, a chief accountant, an accountant, and an IT RPA expert. In addition, the methods and tools used as the development project progressed were presented in workshops to other people in financial management so that they could learn how to use the same methods to develop their own processes. Figure 17 below illustrates the current state of the process to be developed with a SIPOC analysis.

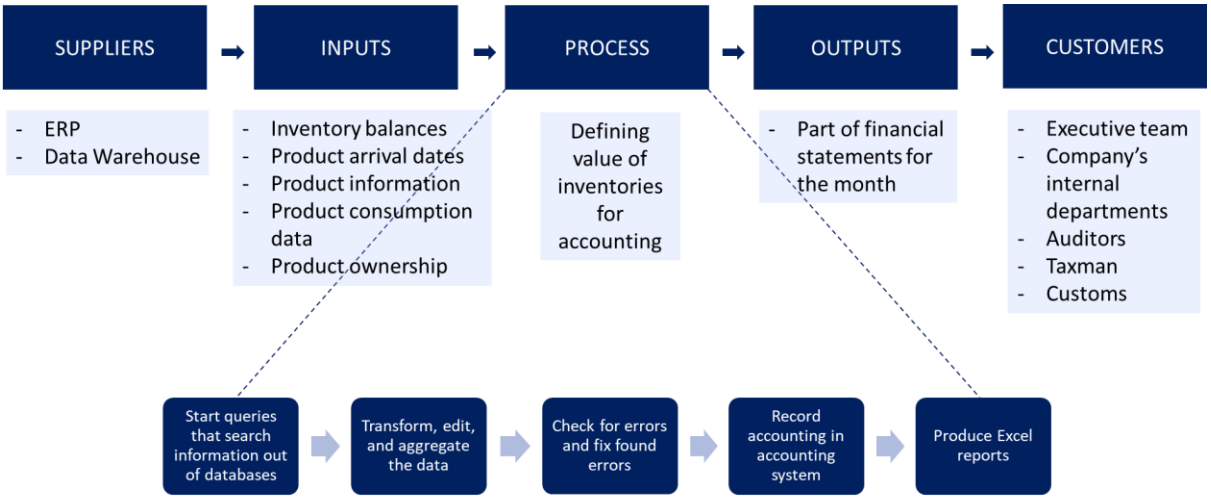

Figure 17 SIPOC on defining inventory levels for accounting

With the help of SIPOC analysis, it can be seen that although the execution of the process requires lots of different information from different tables in the data warehouse, all the information is retrieved from the data warehouse or from the ERP system. One important consideration that emerged from process inputs was knowledge of product ownership due to the company's different types of service businesses to different customers and related rules and logics in company systems. Some of the old practices were found to be redundant and working time can be saved by changing the logic in retrieving information on products with different ownership.

It can also be seen from the analysis that each part of the process is performed very manually. Even if the process steps seem simple in the above analysis, the working instructions for creating the two different inventory lists are in total 18 pages long and the process takes on average 8 hours of working time monthly, which suggests that there is a lot of waste in the process. In addition, the analysis reveals different stakeholders who take advantage of the outcome of the process, which helps to understand the different information needs and preferences of each stakeholder and thus the different forms for the outcome to be shared. On the basis of this analysis alone, new development ideas emerged for the process, which are discussed in more detail in the following sections of the work.

Next, in order to understand the process and its execution at a more detailed level, the more detailed work steps of the process and the systems in which they are performed are described as a Deployment diagram in Figure 18.

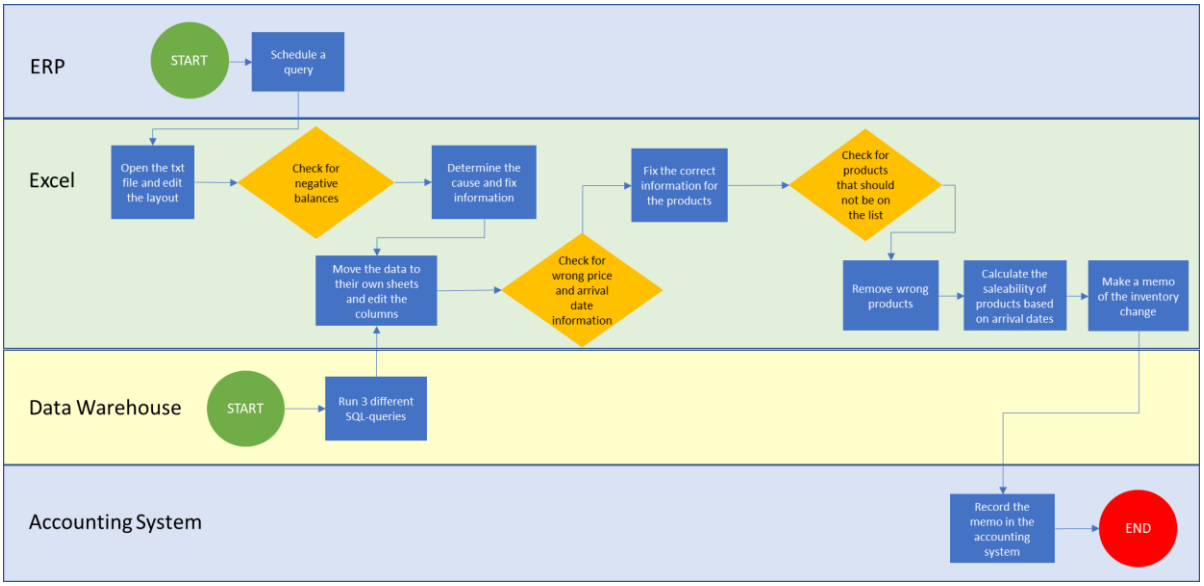

Figure 18 Deployment diagram on defining inventory levels for accounting

The above analysis helps to understand the amount of work to be done in different systems and the connections between different systems in different process steps. As can be seen from the figure, most of the work seems to be related to processing and editing the retrieved data in Excel, as well as clearing and correcting the erroneous data. In addition, as previously noted, information is retrieved separately from the ERP system and data warehouse, and the

information is combined manually. The actual recording of information into the accounting system is only a single working step and it seems that the hardest and most time consuming tasks relate to the retrieving, editing, and correcting of the data to be recorded.

3.4 Measuring the problem's key factors

When the goal is to reduce the turnaround time of the process, it is important to measure the time spent on the process at different stages of the process in order to understand at which stages of the process the most time is spent and thus the development resources can be certainly allocated to the right place. This time, it was already assumed in advance which steps would take the most time, but to ensure this, the time taken to complete the various process steps was measured. The results obtained were in line with the assumptions and thus confirmed the assumptions. The Figure 19 below illustrates the working time spent on the different process steps.

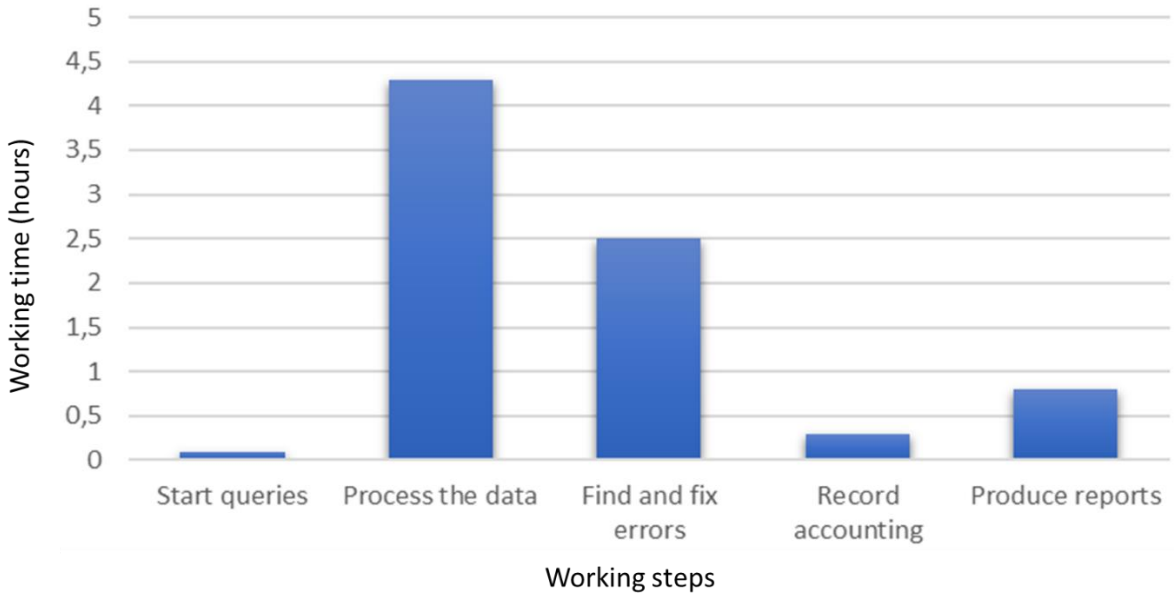

Figure 19 Working time on different process steps

It is clear from the figure that in the process the most time is taken to process and edit the data, and the second most time is spent on the correction work related to the erroneous data. For this reason, it was also decided to develop another measure that measures the number of error situations in addition to monitoring time consumption, so that also this area could be monitored

better. As previously noted from the Deployment diagram, the data is regularly checked for four different errors: incorrect balance, incorrect price information, incorrect arrival time, or incorrect products on the listing. However, only the negative balances of these four possible errors could be deduced from the historical data, so it was decided to make a separate project for measuring and reducing the erroneous data, since the most time consuming part of this process was anyway the editing and processing of the data, and development efforts for that part were also possible to be implemented immediately.

3.5 Analyzing causations for the problem

The analyzes this far have revealed two major time-consuming factors in the process, namely manual data processing and investigation work related to erroneous data. Next, the understanding of these problems was deepened by analyzing the causations and root causes behind them. Although it was decided to separate the project of correcting the erroneous data from this project and thus focus this project on eliminating manual data processing, there was a desire to start looking for root causes of erroneous data as well, as identifying them would help further define the next development projects needed. The fishbone diagram in the Figure 20 describes the various identified factors that affect the working time required to compile the inventory listing, dividing them into different categories and recognizing connections between them.

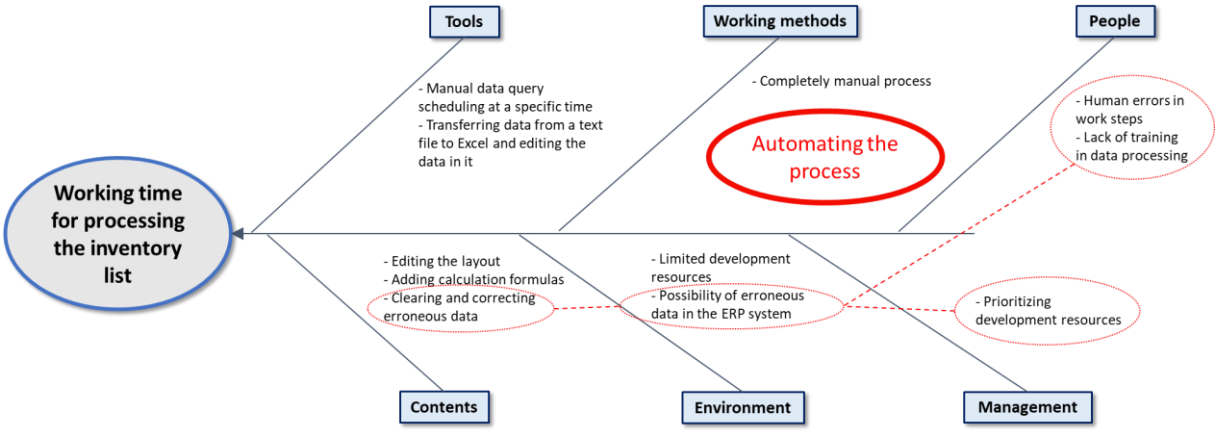

Figure 20 Fishbone diagram on different causes of long working time

It can be seen from the figure that many of the time consuming factors are due to manual processing of the data because of old-fashioned tools or practices as well as various human

errors. On the other hand, the above-mentioned correction of erroneous data was also identified as an important factor, strongly associated with the possibility of errors in the ERP system, which relates to possible errors in other processes. These factors can be seen as the cause of not prioritizing development resources to producing better quality data in other processes and human errors due to lack of training.

It was decided to solve the working time related to manual processing with the help of automation tools, so further analyzing of that problem was not necessary. It was thus wanted to focus the deeper root cause analysis especially on the problems related to data quality. The next workshop therefore went through a systematic analysis of the potential problems in the data formation, which examined the nature, probable causes, frequency, severity and preventive measures of possible errors. During the workshop, several different sources and possible causes for erroneous data were identified, and the root causes of these errors in the data source were identified. The results of the workshop are summarized in the Figure 21 below.

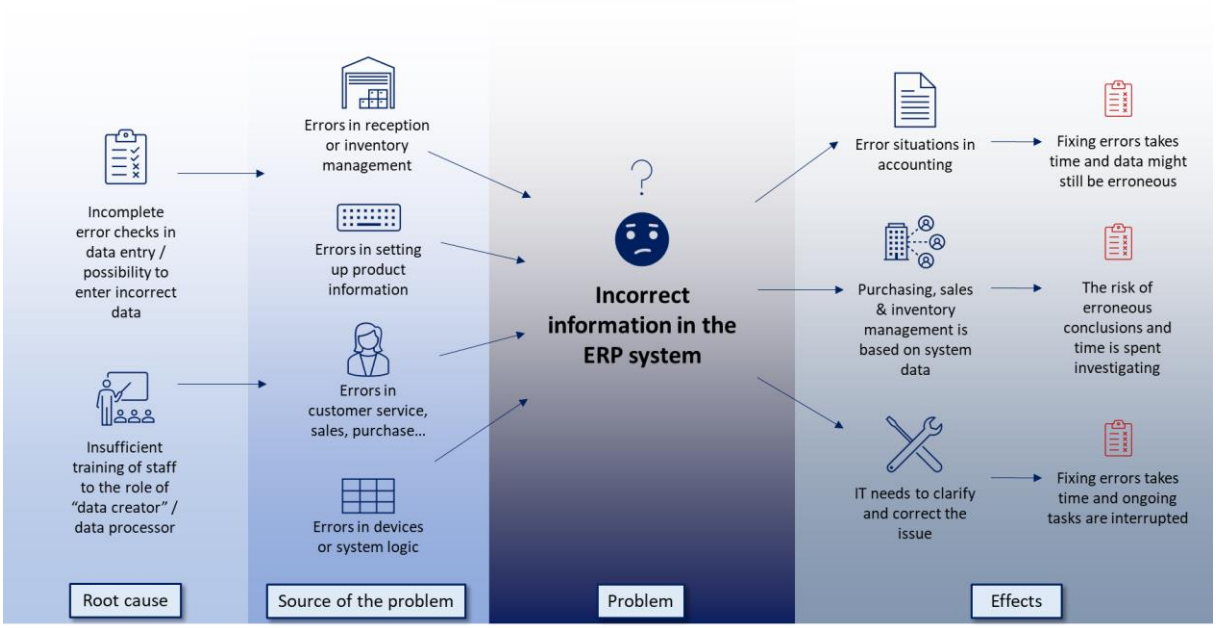

Figure 21 The root causes and effects of incorrect ERP data

It can be seen from the figure that although the analysis was started to achieve time reduction in inventory reporting, errors in ERP data can be seen to affect several other areas throughout the organization. In addition to the occurrence of errors and wasted time in accounting,

purchases, sales and inventory management, among others, are based on the information in the system, and thus the work of these departments runs the risk of erroneous conclusions and actions from erroneous data. In addition, when these errors occur, IT also always has to find out the causes of the errors and correct the data in the systems, which also consumes their time, and interrupts other ongoing tasks. Furthermore, for example in the event of erroneous inventory balances, only the negative balances are discovered, and there is no certainty that other balance errors do not go unnoticed. Therefore, it can be stated that the correction of this problem is very important for the development of data-drivenness and the operation of many departments in the organization, and also for this reason it is good to set aside a completely separate development project for this issue.

Incorrect data is generated systematically, as it has to be corrected in the accounting every month. When the different types of errors were examined further, it became clear that the errors already occur earlier in the processes of, for example, inventory management, product data maintenance, sales, purchasing or customer service. The root cause of these errors was thus identified as insufficient error checks in the data input, as well as insufficient training of staff in the role of the data producer. Thus, training data producers to do the data correctly and to check their own work would significantly reduce the inaccuracy of the data. In addition, indicators of data quality could be developed to be monitored by supervisors to ensure that data quality becomes a regularly monitored issue. On the other hand, rules and restrictions can also be built into the systems, which can prevent incorrect data from being entered into the system in the first place.

3.6 Improving the process and implementing automation

During the Define, Measure, and Analyze phases, problems and their root causes were identified from the process, and waste in process steps was found that can be eliminated by changing procedures. In addition, value-adding and required working steps related to data collection and processing was identified, which, however, are repetitive and manual in nature, which is why it was decided to automate the steps using Microsoft Power data tools.

Using SIPOC and Deployment diagram analyzes, it was identified that some of the data was retrieved from the ERP system and the data warehouse separately, and the data was later

manually combined into a whole. The data in the ERP system is, however, always also run into the data warehouse, which means that all the data can be retrieved from only the data warehouse instead of scheduling a query to produce some of the information from the ERP system and supplementing it with data from data warehouse manually. Furthermore, the data for the two separate inventory listings were acquired and processed separately, which doubled the amount of work required, which could be avoided by creating a better query for the data acquiring, where the ownerships of the products are on a separate column and therefore both listings can be collected and processed at the same time. In addition, with the help of Power Query, the data collecting and processing steps were automated, reducing the cumbersome manual work from this process. The Figure 22 below presents the automatic data model created with Power Query and Power Pivot, that contains all the needed information and processing of the data for the inventory lists.

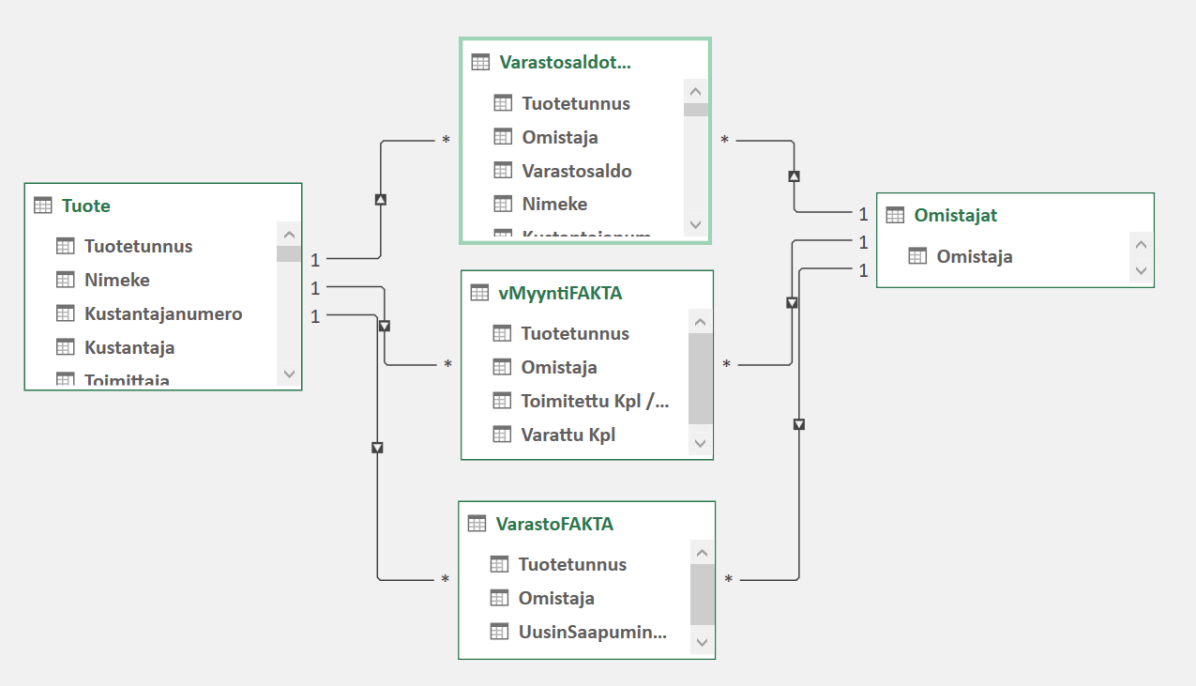

Figure 22 Data model for inventory data collecting

When the data is collected and processed into a structured form in an Excel report, a robot can easily use this information and transform it into the accounting system. The robot implementation, however, is optional, and because of problems discovered in the earlier stages of the data flow, it was decided to implement the robot into the process only after the data is

more reliable. Also, the recording of information into accounting system step is the easiest and least time consuming part of the process, so it was wanted to keep as a manual working step for now, since it also allows for additional check for errors before the earlier discussed problems at the data source have been addressed properly. The Figure 23 below illustrates the changes in the process steps.

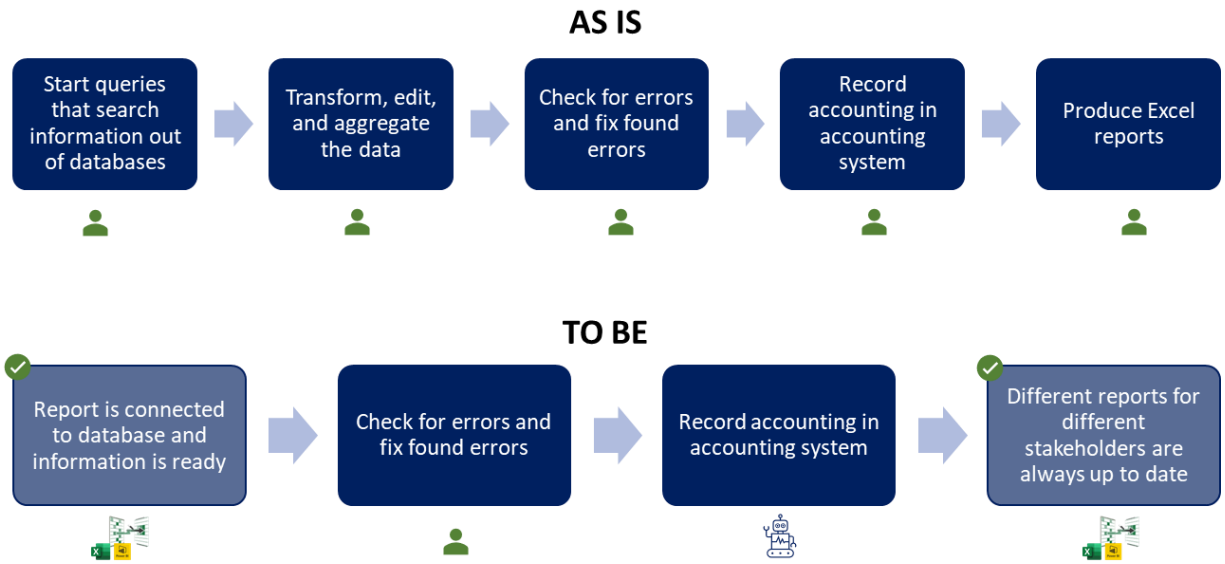

Figure 23 Changes in the process

In addition, when previously an up-to-date overview of inventory status was produced only once a month as a by-product of accounting, the created automatic data model also made it possible to create a daily updating report about inventory status in the form of a visual dashboard that can be shared within the company. In the past, when the company's various departments needed information on stock balances or value within a month, and the end-of-month information was not sufficiently up-to-date for their need, a new query had to be built to the data warehouse each time. In addition to manual work, this led to variations in the content of the queries depending on the report builder and thus to possible ambiguities and differing interpretations within the company.

When up-to-date information is presented on a visual report using an automated query, variations within the queries can be eliminated and, in addition, information sharing and interpretation is easy and fast every day of the month, which allows time to be used for

analyzing the information instead of producing it and wondering whether the information is correct or not. The generated report on inventory levels is presented below in the Figure 24, but the numerical amounts describing the stock have been hidden from the report in this work because they were not intended to be shared publicly.

Figure 24 Automatically updating report of inventory levels

The visuality and interactivity of the reporting view makes it easy to read the data and understand the differences and insights in the data. In particular, the interactive ability to break down the data and drill into it, for example, from product group level to product level, with a few clicks allows one to quickly interpret insights. In addition to the total inventory balance, for example, its distribution by different publishers, ownerships, product groups and salability categories can be easily seen from the report.

3.7 Controlling the process to maintain performance

Once the immediately feasible developments in the process have been completed, it is particularly important to ensure their sustainability in the future. At this stage, the training of staff in data processing and automation tools, in this case the training of financial management

staff in Power Query and Power BI tools, will become an important step. This is important so that, for example, in the case of changed needs in the queries, staff can independently modify automated queries and there is no need to call on outside help to correct the processes created. This training was started in the second to last common workshop meeting, but its continuation will be described in more detail in the next road map phase of the work.

On the other hand, it is also very important to ensure that the major problems identified are resolved in the future and that new development projects are carried out to address the problems identified. Thus, project teams, project managers and schedules for improving the quality of ERP data were developed, and these plans are also presented in more detail in the context of the road map. As the quality of ERP data evolves, its monitoring is an integral part of change management, and the same metrics planned during the measure phase are used here, i.e., the number of erroneous data cases identified and the estimated time spent on investigations and corrections. Deliberate monitoring of these figures brings attention to the issue, which may in itself help to reduce errors, and in addition, as figures evolve, it is known whether the solutions developed produce the desired results or not.

4 ROAD MAP FOR FURTHER DEVELOPMENT

This chapter reflects the results and lessons learned in the development of the case process and combines them with the information learned in the literature review and the information learned about the current state and problems of company's financial management and data utilization. This information will be used to create a road map-style step-by-step strategy to increase the degree of data utilization and automation in the company's financial management in the future. The goal of the strategy is ultimately to steer the company's operations and decision-making in a more data-driven direction by first ensuring data quality, usability, and availability; and then eliminating manual and unnecessary work from processes, allowing employees' time to be used to interpret and share information instead of producing and processing it. A better understanding of the key figures and the factors behind them will lead to better decisions overall in the company, which will make the company more competitive.

4.1 Results and learnings of developing the case process

The data collecting and processing steps were automated in the inventory value reporting process and an automatically updating data model was built, from which the data can easily be used for accounting purposes. This reduced manual work and risk of errors from accounting, and about 4 hours of work per month was saved by implementing this automation alone, in addition to eliminating the possibility of human error from this stage of the process. Furthermore, a visual, automatically updating, and interactive dashboard view was built from the data model, so that comprehensive information on inventory balances and value is always available. Thus, in addition to saving working time from possible queries built on monthly ad-hoc needs, easier-to-interpret, up-to-date, and consistent information is available at any time and can be shared with anyone in the organization.

When financial management processes were analyzed for automation and development, it was found that also in many other processes data is retrieved manually from the same sources each time and data retrieval, processing and recording steps of the processes can be automated quite easily with similar efforts. However, the biggest problem with automation was found to be data reliability and related correcting work of the data due to errors at the source of the data. This was also the reason why a robot was not yet wanted to record the automatically produced

information into the accounting system, since the data was not of sufficient quality to be recorded automatically before addressing the issues at the source of the data first. In the current way of operating, resolving and correcting of these errors becomes the responsibility of the financial management, and when errors are only revealed at the turn of the month, it is much more difficult to correct them compared to if they had already been corrected, for example, during the process where the erroneous data was originally produced into the systems.

4.2 Road map for better data utilization and increasing automation

Data, its utilization, and systematic management have become an increasingly important success factor for companies. In order to harness all its power as a fuel for business and automation, a data strategy, or in other words a road map of steps for better data utilization in a company, is needed. When data and its utilization are to be moved ever closer to business functions, directly where information is used to support operational decision-making, the continuous development of data understanding throughout the organization, from the source of data to senior management, is very important and should be taken into account. Also, with the use of new, easy-to-use, and constantly evolving technologies, information processing becomes more commonplace, and in more and more work tasks, information is processed and utilized as part of one's own work and decision-making.

This is also the case in financial management, and although the utilization of data is becoming more accessible with the help of new technologies, technological development is not slowing down, which is why learning to use modern tools and adopting a climate of continuous development in an organization is an important part of a functioning data strategy to be able to stay competitive and provide customers with relevant services as a company. However, creating a data strategy is not a question of where the technology will evolve in the future, but of what development measures should be taken to make better use of the data to support future activities and decision-making. In other words, the first essential thing is to describe how to make the data to be utilized as efficient, timely, secure and of good quality as possible, so that it can be used in supporting operations and decision making.

In this work, data strategy means a plan to achieve the desired goal of being able to keep increasing automation in financial management to support the desire of more data-driven

operations and decision making. The data strategy answers to the research question of “how to increase the utilization of data and degree of automation in financial management step by step?”. It describes at a sufficient level what needs to be done to achieve the commonly agreed goals and visions, in addition to ensuring a common understanding and commitment of top management to the goals. It also agrees on first steps and a preliminary roadmap on how to take the development forward.

In all the company's operations, data is used to help provide services. It is important that the data in operating systems is of high quality: up-to-date, truthful, internally consistent, human and machine readable, and connectable to other data. The data should also be easily accessible and upgradeable. The aim is that the user interfaces, interfaces, and automation that support the processes can process the data required for the work steps automatically, so that employees do not have to spend time searching for and compiling data from several different systems.

In this work, the company's financial management processes have been studied and problems have been found, the root cause of which has been revealed to be shortcomings in data quality, management, and sharing. There is big quantities of data and much of it is stored in the operational systems of the functions. In many cases, the data of the systems meets the quality requirements of the original use, but there are shortcomings, among other things, in the functionality and quality of the use cases that differ from the original use. There is little data in common use and there is room for improvement in data management and data sharing processes. The development of application programming interfaces (API) is still in its infancy and there is not much common harmonization and distribution of data.

Also, it was identified with the help of root cause analysis that the processes of the company’s other operations systematically produce erroneous data to the systems, making it difficult to utilize the data in automated processes due to uncertainty about the quality of the data. The data obtained from the systems is not seriously dared to be trusted as such, and data users spend a lot of time to ensure the accuracy of the data. In recent years, the focus has been on functions and applications, i.e., what is wanted to be done more automatically. However, it has not been understood to think about what data is needed to perform those functions, what data is generated in any function, and for whom.

For this reason, it is very important to systematically analyze these processes from the perspective of data production and thus organize development projects to improve the quality of output data of these processes. Critical processes for accounting are reception, inventory management, and the creation of product information, but other functions should also be reviewed. The LSS methods presented earlier in the work can be used to support process development, and it is important to take into account that the right people are involved in the development when defining project groups. The key is to bring together all relevant stakeholders at an early stage in the development process, share an understanding of the problem to be solved, identify the data needed and its quality, and work together to develop an innovative solution. As part of this process development, systems and supervisors should also be utilized by building error checks to support data input and instructing supervisors to monitor the quality of the data produced as part of other regularly monitored metrics.

Another very important area for increasing data usability is organization-wide engagement and training in data utilization. Data management is not yet taught comprehensively in universities or secondary schools as part of, for example, accounting training, and there are not many ready-made business-oriented data experts on the market. Therefore, investing in the development of the skills of the company's own staff from top management to the level of the individual employee is important. Different roles in the organization require a common understanding of data-related issues, but also different types of training depending on the employee’s duties. For example, a person working in a data-producing process should be trained to produce high-quality data, data processors and users like accountants should be trained in the use of modern tools, and supervisors and management should be trained so that the topic can be managed correctly. To create a common understanding in the company, for example, common data vocabularies and descriptions of a company's information systems showing where any data is available can be used. In addition, in the case of financial management, learning the Power data tools presented earlier in the work and providing related training is key to increasing the usage of data and automation.

At the same time as data quality and staff competence start increasing to a better level thanks to the above-mentioned development measures, internal data processes can be automated process by process according to the model presented in the work by utilizing a combination of

LSS process development and automation tools. As previously stated, the more processes covered by automation, the more employee time can be spent on value-adding development work and data analysis. In addition, when more time is left for training and understanding of processes and business, less and less manual work can lead to better and better results making the company able to provide increasingly valuable services to their customers.

Once the above areas have been made to work better and financial management is able to make effective use of data and automation to support day-to-day work and decision-making, to take data utilization to the next level, the need to recruit new data professionals should be considered, as well as developing the sharing of different data in the company both internally and externally. When unified data can be utilized across the entire organization and new data on the operation of entire value chains can be combined between stakeholders, new opportunities are created to create value from the data. In addition to having access to new data, at this stage, new value can be achieved by hiring data professionals in different subject areas, such as data scientists, data engineers and data architects as needed. The Figure 25 below summarizes this data strategy and its main components.

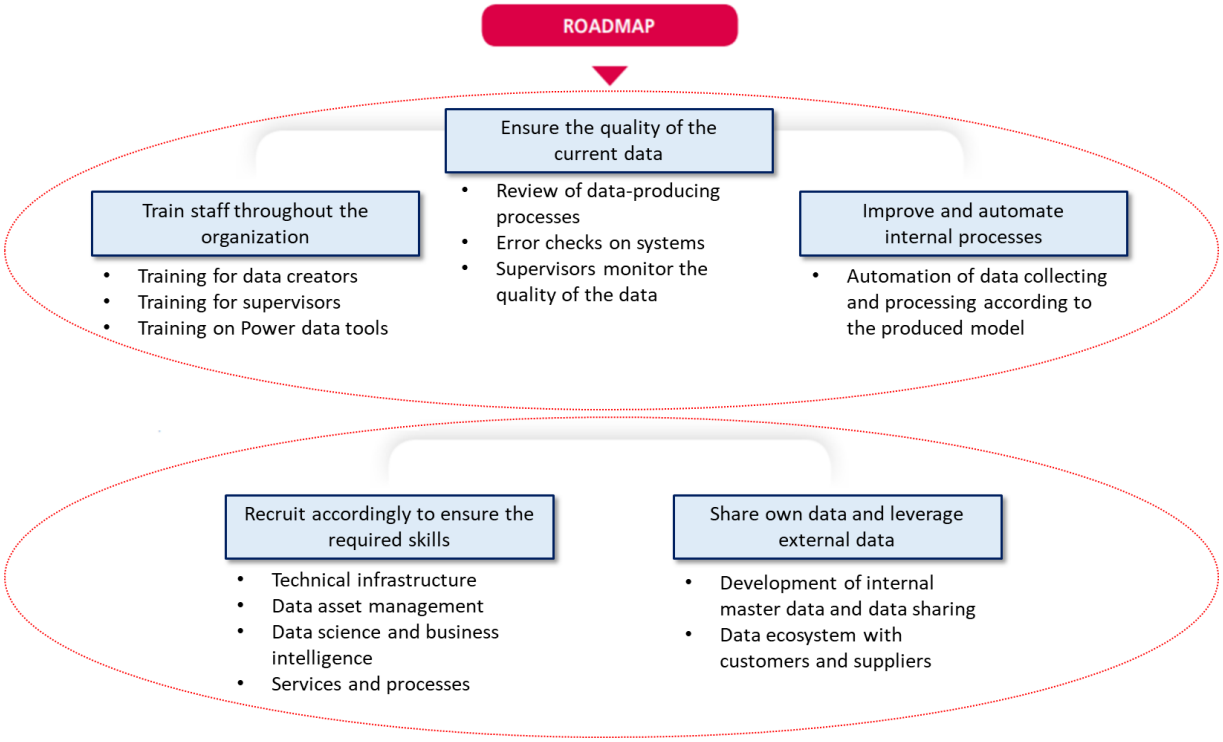

Figure 25 Road map for increasing data utilization and automation

The two ovals in the figure illustrate two different steps in the strategy, the second of which is initiated only after the first has reached a good stage, as mentioned earlier in the text. In conclusion, the company has considerable potential to improve data utilization. There are shortcomings in enterprise processes, information systems, staff training, and internal data management that prevent effective data utilization and sharing between people and processes. In addition, data sharing and aggregation between the company's stakeholders, such as customers and suppliers, is currently limited compared to the possibilities. This is due to the current culture of operation, little encouragement to co-operate, and a lack of common ground. The road map defines the initial steps by which development can be started to harness the true benefits of data in the company.

In order to ensure that the objectives are taken forward as desired, the necessary internal working groups will be set up to help ensure the implementation, monitoring and specification of the data strategy. A data strategy sponsor is selected from the management team, a person responsible for development projects is selected from the financial administration, and a working group of information managers is established, which includes one information manager from each business function. The role of the information manager includes promoting data quality, interoperability and master data management both at the company level and by data area. The group together maintains the common data models in the company, making sure that data is available for everyone that can utilize it in their work. In addition, new data professionals capable of creating more complex statistical models, algorithms and forecasts using the data, can be recruited according to new needs. Also, if necessary, the company's project-specific needs can be supported by external consultants.

However, since building data capabilities is based on skilled people, it is also important to train the company's current staff in data and analytics skills. The balance between new recruitment and training of existing employees should be carefully considered, however, so that experts in the necessary areas are available at the right stages of the data strategy. At the moment, the company does not have experts in hard data science whose expertise is in advanced analytics, data mining and machine learning (ML) methods. On the other hand, the need for such expertise only arises as the data strategy goes further. In addition, currently the maintenance of data resources is largely dependent on IT staff, and the company would thus need its own data

engineer, whose expertise is in the management and development of modern cloud, analytics and data lake environments. The Figure 26 below illustrates the areas of expertise relevant to the strategy.

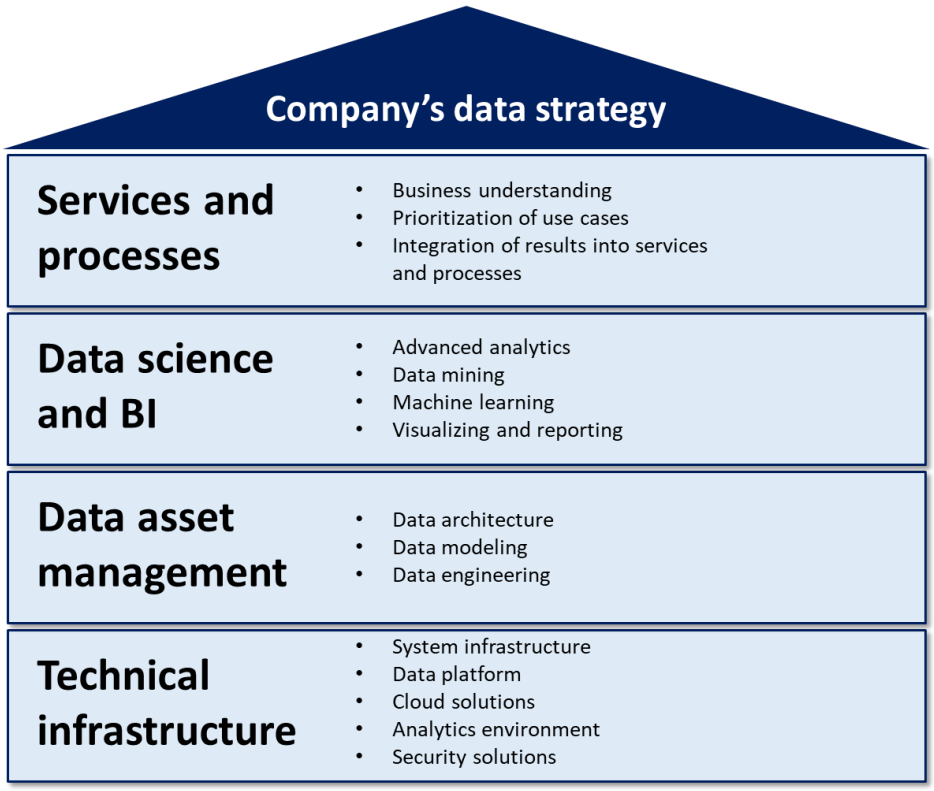

Figure 26 Areas of expertise relevant to data strategy

The company's services and processes guide the goals of data utilization, while Data Science and Business Intelligence generate value from data through reporting and advanced analytics, such as machine learning methods. Data asset management includes all data in operating systems and data platforms, such as data quality, integrations, data modeling, standards, and metadata. Technical infrastructure is related to the development and maintenance of technical data warehouses and data pools. It is essential to understand at what stage the data strategy is going and to anticipate the competence needs in advance, so as not to drift into a situation where the required competence is lacking at a critical moment. However, in the midst of everything new, it is important to remember that data and related skills and technologies only generate business benefits when the focus is on solving people's problems. By combining data expertise with service design thinking and placing the development of customer understanding at the heart of everything, impressive results can be achieved.

5 CONCLUSIONS AND FURTHER RESEARCH

5.1 Research result

In a data-driven organization, for financial management, in addition to producing the key figures and accounting, analyzing and understanding the causalities behind these figures, i.e., information produced by operations and processes, becomes an important task. This means helping the company deepen the knowledge behind the achieved performance figures and to, for example, produce recommendations and forecasts for the management team based on this information. With supporting data-analysis companies can make smarter, data-driven decisions, such as identifying ways to increase profits, analyze customer behavior, compare performance to competitors, track own performance, optimize operations, predict success, identify market trends, or find and solve various challenges and problems.

However, with limited resources, this means that previously time-consuming, error-prone, and manual data collecting, processing, and recording processes should occur as automatically and reliably as possible in the background so that people's working time can be used to interpret and share the information produced. To help achieving these goals, there are powerful automation technologies such as Query and Report Automation and Robotic Process Automation, the effective utilization of which, however, often requires high-quality process development groundwork to understand and correct process problems and their root causes before automation. Poussa (2020) also emphasizes in the results of his master's thesis that understanding and developing processes before automation is necessary to enable sustainable and scalable automation solutions. This enables the creation of reliable and sustainable automation solutions, and these process development needs can be aided by, for example, Lean Six Sigma problem-solving methods. These actions and tools aim for continuous, planned, targeted, and systematic action to enhance existing practices, with the goal of improving the performance of the organization. The research question *"how Lean Six Sigma DMAIC practices can be combined with modern automation tools to improve and automate financial management processes?"* was thus answered by documenting the development efforts done to a process to create a model of automating similar processes.

In order to be able to target development projects correctly, it was important to define the current state of the company's financial management and prioritize the processes that require the most development before starting process development. During the work, several workshop-style group meetings were held with financial management staff, where, among other things, processes were described and prioritized, process problems and their root causes and solutions were identified, and employees were trained by lecturing on the topic. The contents of these workshops are summarized in the Appendix 1. The research question *"how to identify financial management processes to be developed and prioritize them?"* was thus answered by doing group work with the help of LSS process describing tools in the first workshop meetings.

In addition to automating the production of information, good visualizing of the information can significantly improve the readability and comprehensibility of the data. As the amount of data sources and data keeps growing, interpreting it without good visualization becomes very difficult, if not impossible. Good data visualization allows for quick and versatile interpretation of data, providing the reader with a good picture of the differences, evolution, and significance of the data and phenomena behind it. Using interactive, auto-updating reporting views to display data, entire topics can be condensed into an easy-to-interpret page that allows one to drill down to specific topics and compare data and metrics effortlessly. In addition to reading the data quickly, this facilitates the accuracy and versatility of the data by allowing multiple perspectives to be viewed from the same page. Moreover, once such reporting views have been created, there is no need to spend working time re-creating them, for example, every month, leaving more time for discussion and decision-making. Furthermore, when all users of reports have consistent data, metrics, and entities behind the visuals, things are more likely to be discussed from the same perspective, reducing inconsistencies and contributing to a common, data-driven, and conversational atmosphere around decision-making. This is also supported by Litmanen (2019) in the results of her master's thesis, where she concludes that with the help of good visualization of data, patterns and connections between different indicators can be noticed from complex financial data and early signs of trend changes can be seen more easily. She also explains that visualization can be used to communicate financial information in an easy-to-assimilate way, helping other employees in the organization understand financial concepts and goals. The credibility of financial information is thus enhanced when more people have an understanding of the financial situation and the related cause-and-effect relationships.

However, the more automatic the data collecting, processing, recording, visualizing, and communicating processes become, the more important it is to make sure that erroneous data is not produced into the systems at the source of the data. With automation, human errors disappear during the execution of the process, but on the other hand, it increases the importance of the source material, in the formation of which human errors may still arise. The accessibility to flawless data is therefore an absolute basis for automatic data-driven operations and decision-making, on which development resources and measures must be intentionally focused. Lenni-Taattola (2019) also states in the results of his master's thesis that one of the major risks in processes automated with Robotic Process Automation is the correctness of the input data, as robots may not be able to identify erroneous data like humans but work directly with the values assigned to them. This can go unnoticed in automated data processes and when erroneous data is critical, major risks for decision-making are caused.

The study answered the research question *"how to increase the utilization of data and degree of automation in financial management step by step?"* by creating a data strategy with the main focus on staff training throughout the organization and process development focusing on key problem areas, such as data reliability. When data and its importance to business are understood throughout the organization and staff is continuously trained in the use of modern technologies and methods related to their own tasks, a unified culture of data utilization can begin to be built in the company and the real benefits of data for operations, automation, and decision-making can be realized. For this reason, nominating responsibilities as well as training and involving all staff in the change became important issues in the data strategy. These ideas are also supported by Korhola (2019) in the results of her master's thesis, where she says it is important to appoint a person in charge to take forward automation projects, but also to involve the whole staff in projects and communication already at the beginning of the projects to increase the chance of successful development efforts. Säntti (2021) also states in her report, in which the data executives of Finland's largest companies were interviewed, that a unified understanding of data and a culture of data utilization throughout the organization is the basis of a functioning data strategy.

5.2 Further research

An interesting subject for further research would be the use of different automation means and artificial intelligence (AI) in ensuring the source data quality and correctness, as risks of human error regarding the source data, which is critical for other automation, could also possibly be eliminated with the help of right intelligent solutions. Solving this problem would eventually make it possible to automate all data flow in processes and operations, leaving less if any manual work to people.

REFERENCES

Aalst van der, W. M. P., Bichler, M. & Heinzl, A. (2018). Robotic Process Automation. Business & Information Systems Engineering, 60(4), 269-272.

Aartsengel, K. & Kurtoglu, S. (2013). Handbook on continuous improvement transformation: The lean six sigma framework and systematic methodology for implementation. Berlin. Springer Berlin Heidelberg. 643.

Alhola, K. (2010) Taloushallinnon kiehtova ja vaativa maailma. Tilisanomat 17.8.2010, [WWW-article]. [referred 27.2.2021]. Available: https://tilisanomat.fi/talousohjaus/taloushallinnon-kiehtova-ja-vaativa-maailma

Appelbaum, D., Kogan, A., Vasarhelyi, M., & Yan, Z. (2017). Impact of business analytics and enterprise systems on managerial accounting. International Journal of Accounting Information Systems, 25, 29-44.

Asatiani, A., & Penttinen, E. (2016). Turning robotic process automation into commercial success–Case OpusCapita. Journal of Information Technology Teaching Cases, 6(2), 67-74.

Ballé, M., Chartier, N., Coignet, P., Olivencia, S., Powell, D., & Reke, E. (2019). The Lean Sensei. Lean Enterprise Institute Inc. 172.

Barraza, M. F. S., Smith, T., & Dahlgaard-Park, S. M. (2009). Lean-kaizen public service: an empirical approach in Spanish local governments. The TQM Journal, 2(2), 143-167.

Bell, S. C., & Orzen, M. A. (2016). Lean IT: Enabling and sustaining your lean transformation. CRC Press. 370.

Bhimani, A., Willcocks, L. (2014). Digitisation, 'Big Data', and the transformation of accounting information. Accounting and Business Research, 44(4), 469-490.

Boulton, C. (2017). What is RPA? A revolution in business process automation. Computerworld Hong Kong, Newton.

Burgess, N., & Radnor, Z. (2013). Evaluating Lean in healthcare. International journal of health care quality assurance, 26(3), 220-235.

Bygstad, B. (2017). Generative innovation: a comparison of lightweight and heavyweight IT. Journal of Information Technology, 32(2), 180-193.

Chiarini, A. (2013). Lean organization: from the tools of the Toyota Production System to lean office. Springer Science & Business Media. 168.

Cunningham, J., & Fiume, O. (2003). Real numbers: management accounting in lean organization. Managing Times Press. 194.

Cunningham, J. & Jones, D. (2007). Easier, simpler, faster. Systems strategy for Lean IT. New York: Productivity Press. 192.

Dahlgaard, J. J., & Dahlgaard-Park, S. M. (2006). Lean production, six sigma quality, TQM and company culture. The TQM magazine, 18(3), 263-281.

Davenport, T. H., & Kirby, J. (2016). Just how smart are smart machines?. MIT Sloan Management Review, 57(3), 21.

Fersht, P., & Slaby, J. R. (2012). Robotic automation emerges as a threat to traditional low-cost outsourcing. HfS Research. Retrieved August, 16, 2019.

Florea, B. (2017). 6σ, Lean and RPA. UiPath blog 16.3.2017, [WWW-article]. [referred 13.7.2021]. Available: https://www.uipath.com/solutions/whitepapers-old-feb2020/6%CF%83-lean-and-rpa-an-open-conversation

Fung, H. P. (2014). Criteria, use cases and effects of information technology process automation (ITPA). Advances in Robotics & Automation, 3.

García-Alcaraz, J. L., Oropesa-Vento, M., & Maldonado-Macías, A. A. (2017). Kaizen planning, implementing, and controlling. Springer International Publishing. 314.

Gatsheni, B. N., & Khumalo, S. (2018). A framework for understanding the impact of Business intelligent systems in optimized decision making and organization performance. In Proceedings on the International Conference on Artificial Intelligence (ICAI) (pp. 329-335). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp).

Gupta, S., & Sharma, M. (2016). Lean services: a systematic review. International Journal of Productivity and Performance Management, 44(8), 1025-1056.

Hallikainen, P., Bekkhus, R., & Pan, S. L. (2018). How OpusCapita Used Internal RPA Capabilities to Offer Services to Clients. MIS Quarterly Executive, 17(1), 41-52.

Hämäläinen, V., Maula, H., & Suominen, K. (2016). Digiajan strategia. Helsinki: Alma Talent. 240.

Ilmarinen, V., & Koskela, K. (2015). Digitalisaatio: yritysjohdon käsikirja. Helsinki: Talentum. 250.

John, A., Meran, R., Roenpage, O., & Staudter, C. (2008). Six Sigma+ Lean Toolset: Executing Improvement Projects Successfully. Springer Science & Business Media. 316.

Jones, D. T., & Womack, J. P. (2016). The evolution of lean thinking and practice. The Routledge companion to lean management. Routledge. 500.

Kaarlejärvi, S. (2020) Analytiikka syö raportoinnin aamiaiseksi. Efima blogi 12.8.2020, [WWW-article]. [referred 27.2.2021]. Available: https://www.efima.com/blogi/analytiikka-syo-raportoinnin-aamiaiseksi/

Kaarlejärvi, S. (2017). RPA – robotiikalla parempaan arkeen. Efima blogi 7.9.2017, [WWW-article]. [referred 10.5.2021]. Available: https://www.efima.com/blogi/rpa-robotiikalla-parempaan-arkeen/

Kaarlejärvi, S. & Salminen, T. (2018) Älykäs taloushallinto: automaation aika. Helsinki, Alma Talent Oy. 270.

Katko, N. S. (2013). The Lean CFO: Architect of the Lean Management System. CRC Press. 151.

Kohtamäki, Marko. (2017). Real-Time Strategy and Business Intelligence Digitizing Practices and Systems. Cham: Springer International Publishing. 227.

Korhola, J. (2019). Utilization of robotic process automation at the organization offering inspection, testing and certification. Master's Thesis. Lappeenranta-Lahti University of Technology, Industrial Engineering and Management.

Kumar, U. D., Crocker, J., Chitra, T., & Saranga, H. (2006). Reliability and six sigma. Springer Science & Business Media. 386.

Kurki, M., Lahtinen, M. & Lindfors, H. (2011) Verkkolasku käyttöön! Hämeenlinna. Kariston Kirjapaino Oy. 100.

Lahti, S. & Salminen, T. (2014). Digitaalinen taloushallinto. Helsinki, Sanoma Pro Oy. 240.

Lacity, M. C., & Willcocks, L. P. (2016). A new approach to automating services. MIT Sloan Management Review, 58(1), 41-49.

Lenni-Taattola, L. (2019). Effects on risks leading from utilizing robotic process automation in banking and finance industry. Master's Thesis. Lappeenranta-Lahti University of Technology, Industrial Engineering and Management.

Ling, X., Gao, M., & Wang, D. (2020). Intelligent document processing based on RPA and machine learning. In 2020 Chinese Automation Congress (CAC) IEEE. 1349-1353.

Litmanen, R. (2019). Visualizing financial reporting in a service company. Master's Thesis. Lappeenranta-Lahti University of Technology, Industrial Engineering and Management.

Lomanto, D. (2019). What does it Mean to Think with an Automation First Mindset?. UiPath blog 19.9.2019, [WWW-article]. [referred 6.5.2021]. Available: https://www.uipath.com/blog/automation-first-mindset

Madakam, S., Holmukhe, R. M., & Jaiswal, D. K. (2019). The future digital work force: robotic process automation (RPA). JISTEM-Journal of Information Systems and Technology Management, 16.

Martin, J.M. (2008). Lean Six Sigma for the Office. CRC Press Taylor & Francis Group. 348.

Microsoft. (2021). What is Power BI?. Microsoft Power Platform Documentation 29.03.2021, [WWW-article]. [referred 19.7.2021]. Available: https://docs.microsoft.com/fi-fi/power-bi/fundamentals/power-bi-overview

Moayed, V. (2020). The RPA Opportunity for Lean Six Sigme Practitioners. UiPath blog 31.8.2020, [WWW-article]. [referred 4.5.2021]. Available: https://www.uipath.com/blog/rpa-opportunity-for-lean-six-sigma-practitioners

Modig, N., Åhlström, P. (2018). Tätä on Lean. Ratkaisu tehokkuusparadoksiin. 7. painos. Tukholma: Rheologica Publishing. 167.

Moffitt, K., Rozario, A. & Vasarhelyi, M. (2018). Robotic process automation for auditing. Journal of Emerging Technologies in Accounting, 15(1), 1-10.

Murdoch, R. (2018). Robotic process automation. Guide to building software robots, automate repetitive tasks & become an RPA Consultant. Eigenverlag. 77.

Ostdick, N. (2016) 5 Factors in Choosing Which Processes to Automate. UiPath blog 29.9.2016, [WWW-article]. [referred 9.3.2021]. Available: https://www.uipath.com/blog/5-factors-in-choosing-which-processes-to-automate

Passy, J. (2017): Robotic Process Automation. National Mortgage News, 41(9), 18.

Penttinen, E., Kasslin, H., & Asatiani, A. (2018). How to choose between robotic process automation and back-end system automation?. European Conference on Information Systems. Portsmouth, United Kingdom.

Poussa, H. (2020). Challenges of scaling robotic process automation. Master's Thesis. Lappeenranta-Lahti University of Technology, Industrial Engineering and Management.

Puusa, A., & Reijonen, H. (2011). Aineeton pääoma organisaation voimavarana. UNIpress. 432.

Pyzdek, T., & Keller, P. A. (2003). The Six Sigma Handbook: A complete guide for green belts, black belts, and managers at all levels. 848.

Rad, R. (2017). Power BI from Rookie to Rock Star. RADACAD Systems Limited, Auckland, New Zealand. 1700.

Rother, M. (2011). Toyota Kata: Ihmisten johtamista kohti parantamista, mukautumista ja parempia tuloksia. Helsinki: Readme. fi. 160.

Shalloway A., Baver G. & Trott J. R. (2009). Lean-Agile Software development Achieving Enterprise Agility. Boston: Addison-Wesley. 304.

Shokri, A., & Li, G. (2020). Green implementation of Lean Six Sigma projects in the manufacturing sector. International Journal of Lean Six Sigma.

Strutner, S. (2020). Financial Management Explained: Scope, Objectives and Importance. Oracle Netsuite Educational Resources 2.10.2020, [WWW-article]. [referred 3.5.2021]. Available: https://www.netsuite.com/portal/resource/articles/financial-management/financial-management.shtml

Säntti, R. (2021). Data X Bisnes - Millaisia dataan liittyviä kehityshankkeita suomalaisissa organisaatioissa on juuri nyt meneillään?. TietoEVRY data insiders report 13.4.2021, [WWW-report]. [referred 29.7.2021]. Available: https://www.tietoevry.com/fi/kampanjat/2021/data-insiders/#Data-X-Bisnes-2021-96157

Taghizadegan, S. (2006). Essentials of lean six sigma. England. Elsevier inc. 304.

Torkkola S. (2015). Lean asiantuntijatyön johtamisessa. Helsinki: Alma Talent. 274.

Vivekananthamoorthy, N., & Sankar, S. (2011). Lean Six Sigma. In Six Sigma Projects and Personal Experiences. IntechOpen.

Weill, P. & Woerner, S. L. (2015). Thriving in an Increasingly Digital Ecosystem. MIT Sloan Management Review, 56(4), 27.

Willcocks, L., Lacity, M. & Craig, A. (2015a). The IT Function and Robotic Process Automation. The Outsourcing Unit Working Research Paper Series, paper 15/05. London, United Kingdom, London School of Economics and Political Science.

Willcocks, L., Lacity, M. & Craig, A. (2015b). Robotic Process Automation at Xchanging. The Outsourcing Unit Working Research Paper Series 15/03. London, United Kingdom, London School of Economics and Political Science.

Willcocks, L., Lacity, M., & Craig, A. (2016). Robotic process automation at Telefonica O2. MIS Q Exec, 15(1), 21-35.

Womack, J. P., & Jones, D. T. (1997). Lean thinking—banish waste and create wealth in your corporation. Journal of the Operational Research Society, 48(11), 1148-1148.

Zhang, N. & Liu, B. (2019). Alignment of business in robotic process automation. International Journal of Crowd Science, 3(1), 26-35.

APPENDICES

Appendix 1 Summary of workshop meetings

Meeting	Purpose	Contents	Outputs	Participants	Duration
Workshop 1	Defining goals for the project	Discussion on the current state and needs of financial management	Preliminary goal and plan for the project	CDO, CFO	1 hour
Workshop 2	Starting the project and identifying key processes	Lecture on lean and digital financial management, presentation of goals, identification of processes	SIPOC analyses on identified key processes	Whole financial management department, CFO, CDO, IT RPA expert, HR expert	2 hours
Workshop 3	Analyzing and prioritizing key processes	Presentations of SIPOC analyses, discussion, and prioritization work	Prioritization decisions and Deployment diagrams on chosen processes	Whole financial management department, CFO, CDO, IT RPA expert, HR expert	3 hours
Workshop 4	Define, Measure and Analysis on problem of process	Lecture on LSS DMAIC tools and automation	Project charters and fishbone diagrams on chosen processes	Whole financial management department, CFO, CDO, HR expert	1 h 30 min
Workshop 5	Understanding problem's root causes and effects	Potential Problem Analysis, Root cause Analysis	Potential Problem Analysis, Root cause Analysis	LSS project team of inventory reporting process	1 h 30 min

Workshop 6	Reflecting on learnings and brainstorming ideas	A review of what has been done so far and discussion	Ideas for inventory reporting process	CFO, Accountant	1 hour
Workshop 7	Training staff	Lecture on lean and automation in financial management and reflecting on learnings	-	Whole financial management department, HR expert	1 h 30 min
Workshop 8	Training project leader for future projects	Defining responsibilities and reflecting on what has been done	-	CDO, future project leader	1 h 30 min
Workshop 9	Training staff	Introductory training to Power data tools	-	Whole financial management department, CFO	1 h 30 min
Workshop 10	Situation report	Presentations on the progress of development projects and ensuring the formation of project groups	Project groups and timelines for found development needs	Whole financial management department, CFO, CDO, HR expert	1 h 30 min
Workshop 11	Final meeting	Finishing first project with reflection and starting continuous development by presenting road map	-	Whole financial management department, CFO, CDO, HR expert	1 h 30 min