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Master

Navigating Change: the Impact of SAP ERP

Navigating Organizational Change and Changes in Management Accounting: A Case Study on a Large Food Supplier

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The thesis has been developed in cooperation with a large organization. We sought an organization willing to contribute and provide valuable data for our thesis. Before contacting our collaborative partner, we carefully formulated our research question. The company we have collaborated with has been highly supportive and assisting us in identifying suitable participants for our interviews.

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Abstract

Adopting ERP systems has facilitated improved coordination and collaboration across various company functions. However, insufficient preparations can pose challenges during the implementation phase for companies. Even after the implementation, difficulties may arise due to integrating multiple functions into a single system, potentially impacting management accounting processes. Organizations considering ERP implementation should know the extensive preparations required during the adoption phase.

The objective of this thesis is to highlight the potential consequences, both positive and negative, of implementing an ERP system on an organization and its management accounting practices. Data for this study was gathered through semi-structured interviews conducted with a large organization. These interviews revealed several key findings, including the significant impact of the initial failed implementation, the establishment of master data as a mandatory component of the new SAP ERP system, and the integration across various functions within the organization. Their initial implementation failed due to inadequate preparations and an imprecise assessment of their progress. Furthermore, the implementation did not significantly change the role of management accounting within the company. Instead, the position of management accounting became cemented rather than altered as a result of the implementation. This is because management accounting's responsibilities remained unchanged within the company and their adoption from an outdated ERP system to a more modern one. While the company experienced both disadvantages and benefits from implementing SAP ERP, it can be concluded that overall, the implementation has proven to be highly advantageous.

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Chapter 1

Introduction

Enterprise Resource Planning (ERP) systems have attracted significant attention from practitioners and academics due to their widespread adoption across industries (Al-Mashari, 2003; Shehab et al., 2004). These systems are comprehensive business management solutions, integrating multiple modules to connect and streamline complex processes, functions, and information across various departments and functional areas within an organization (Al-Mashari, 2003). Additionally, ERP systems enable communication and integration with suppliers and customers (Shehab et al., 2004). The integration capabilities of ERP systems provide real-time access to data for all personnel within the organization, allowing for seamless information transfer between functional areas (Shehab et al., 2004). This facilitates the sharing of data and information across departments such as inventory, production, planning, finance and control, human resources, logistics management, marketing, and operations (Al-Mashari, 2003).

ERP system integration allows for better coordination and collaboration among various teams, facilitating effective management accounting and control (Scapens & Jazayeri, 2003). Management accountants can access comprehensive and up-to-date information, enabling them to make more informed decisions and respond quickly to changes in the business environment (Caglio, 2003). Moreover, ERP systems allow for the implementation of standardized processes and controls. Organizations can define and enforce consistent accounting and control procedures across different locations and business units (Heinzelmann, 2017; Quattrone & Hopper, 2005).

Additionally, ERP systems automate routine tasks like inputting data and processing transactions (Shehab et al., 2004). This automation allows management accountants more time for essential activities that bring value, such as conducting strategic analysis and collaborating with other business departments (Scapens & Jazayeri, 2003). By taking care of routine tasks, ERP systems enable management accountants to concentrate on essential activities that contribute to the organization's success.

In addition to its impact on management accounting and control, ERP systems also drive organizational changes (Quattrone & Hopper, 2005; Scapens & Jazayeri, 2003). Implementing ERP systems requires organizations to reevaluate and redefine their business processes,

workflows, and organizational structures to align with the system's functionalities or extensively customize the ERP solution to align with the organizational parameters (Dechow & Mouritsen, 2005). These changes can increase efficiency, improve coordination, and enhance collaboration across departments (Scapens & Jazayeri, 2003). However, they can also present challenges regarding employee resistance, skill gaps, and the need for training and education to ensure successful adoption and utilization of the ERP system (Heinzelmann, 2017). The implementation process can also be challenging depending on the complexity of the organization and the amount of customization required to achieve sufficient integration of processes to increase efficiency and control, as evidenced by Dechow and Mouritsen, 2005.

This thesis focuses on organizational changes resulting from ERP implementation and how the ERP system affects the management accounting function. To investigate this, we draw on previous case studies within the same domain and discuss the findings of our qualitative interviews to compare and evaluate our data.

How has the implementation of SAP affected the organization and management accounting practices?

We conducted semi-structured interviews with managers and IT staff to answer this research question. Our research question is aimed at how the ERP system has affected an organization, specifically how people's work routines and processes have changed. Within qualitative research methods, interviews are a common and important methodology (Qu & Dumay, 2011), and interviews are relevant because they give us insight into how the ERP system has affected different functions and processes. Additionally, the number of interviewees available might be limited, and gathering the most data from each interviewee is essential for the study.

Furthermore, we have chosen to investigate the management accounting processes that the company practiced before ERP and compare them to their current processes. ERP systems change the management accounting processes and functions because of the standardization of "best-practice" processes inscribed in the system, which can cause challenges for management accountants who are used to performing their tasks in their ways (Heinzelmann, 2017).

Chapter 2 reviews the current literature on ERP systems, management accounting and control, and cloud computing to provide a foundation for future analysis. Chapter 3 describes the research methodology used to investigate the research phenomenon. Chapter 4 includes a description of the case organization and a brief recollection of their ERP system's history and current status. Chapter 5 describes the results of the interviews that were conducted. Chapter 6 summarizes key insights from the interviews and compares them with existing theories.

Chapter 2

Literature Review

2.1 Management Accounting and Control

Management accounting is a business function and a process that applies accounting and financial management principles to produce and present information that guides managers to make decisions that create, protect, preserve, and increase value for stakeholders in an organization (Bhimani et al., 2019, p.3). Informational requirements within an organization drive the process and should provide the basis for operating and investment decisions (Atkinson et al., 1997, p.3).

Using management accounting information, management accountants supply managers across all organizational levels with analysis and reporting that shows the performance of each business function (Atkinson et al., 1997, p.4). This management accounting information contains financial and operational data of an organization's activities, processes, operating units, products, services, and customers (ibid.). By synthesizing this information in reports and analysis, managers and employees can gain insight into the organization's economic performance, specifically regarding the cost and profitability of products and services, the customers, and activities (ibid.). This also includes performance metrics for subsidiaries, departments, and divisions across the organization (ibid.). Management accounting information differs depending on where it is used in the organization (Atkinson et al., 1997, p.11). At a production line where raw materials are processed and turned into products, the information is used to improve operations, and the data used is based on performance metrics related to the productivity of the production, such as material utilization, manufacturing speed, and product output (ibid.). At this level, the data received is frequent to evaluate progress and productivity continuously. At a level above that, where middle managers organize resource usage, products, services, and customers, the data usage is not required to be as frequent as it is used to monitor which operational areas require additional follow-up and control (ibid.). At the highest organizational level, the accounting information is derived from transactional data from various functional, departmental, and customer levels. It is used for decisions with significant strategic importance or long-term consequences for the organization (ibid.).

Management accountants also play an important role in supporting managers in making

strategic decisions to identify market opportunities and match those opportunities with the specific capabilities within the enterprise (Bhimani et al., 2019, p.6). By analyzing the capabilities in areas such as customers, suppliers, competitors' products, and funding of strategic initiatives, they play a crucial role in building strategies that drive value (ibid.). Companies that adapt to the market and seize opportunities to build long-term shareholder value are more successful than companies that overly prioritize internal cost control and short-term shareholder value (ibid.). Therefore, management accounting information is not only used to control and solve internal problems but has been increasingly important to look outwards and evaluate strategic progress over more extended periods (Bhimani et al., 2019, p.7).

The accounting systems in an organization serve five essential purposes (Bhimani et al., 2019, p. 8):

Formulating overall strategies and long-term plans

The development of new products and investments in both tangible and intangible assets often require specialized reports. Many organizations are now actively seeking market, supplier, and customer-based information to inform their long-term strategic decision-making processes (ibid.).

Resource allocation decisions such as product and customer emphasis and pricing:

This process typically entails the preparation of reports that assess the profitability of various products or services, brand categories, customers, distribution channels, and other related factors. These reports are crucial for evaluating the financial viability of the organization's operations and making informed decisions regarding resource allocation and strategic planning (ibid.).

Cost planning and cost control of operations and activities :

This includes reports on revenues, costs, assets, and liabilities of business areas, subsidiaries, and divisions. It is important in providing data-backed information to managers for decision-making (ibid.).

Performance measurement and evaluation of people:

This function is centered around comparing actual results with planned results, and the performance evaluations can be based on financial and non-financial data (ibid.).

Meeting external regulatory and legal reporting requirements where they exist:

Regulations and legal statutes often determine which accounting methods are allowed and which must be followed. Financial reports are one example of reports that can have legal requirements, guidelines, and procedures that organizations have to adhere to (ibid.).

Two core principles in management accounting are planning and control. Bhimani et al., 2019, p.9 describes this connection between planning and control in a management control system as a feedback loop. Planning in a management accounting system represents choosing goals, predicting results, and then deciding how to reach those goals (ibid.). These require-

ments and predictions are input into the management accounting system through budgets, which provide the basis for the performance review after the controlling is finished (ibid.). The control function implements a solution based on the plan, inputs the data by recording transactions and classifying them within the management accounting system, and compares the data to the budget (ibid.). They can then extract performance reports based on how the implemented solution performed in accordance with the plan, providing valuable feedback that can then be used to plan another solution that is adjusted based on the performance report (Bhimani et al., 2019, p.10).

Over the past decade, and with the emergence of new technologies and digital tools, the business function of management accountants has changed from a monitoring and control perspective to a more business and support-oriented function (Bhimani et al., 2019, p.8). This change has also facilitated different requirements in the business knowledge from management accountants, as they have needed to understand the company's inner workings more than before (Scapens & Jazayeri, 2003). Additionally, they have been more involved with working alongside managers or as partners in cross-functional teams rather than being an independent accounting function separate from most business areas (Bhimani et al., 2019; Heinzelmann, 2019, p, 8). This change in function has caused management accountants to be more oriented toward analysis, strategy, planning, and management support, as opposed to a routine accounting function. The emphasis on the "business-partner" function results from greater automation of everyday tasks and reporting because of digital tools and software packages (Heinzelmann, 2019). Additionally, with rapid changes in technology that have significantly increased the volume of both structured and unstructured data along with new methods of gathering, consolidating, manipulating, and extracting data, management accountants are required to adapt to take advantage of opportunities and manage the challenges to aid data-backed decisions and insights (Bhimani et al., 2019, p.18). Some authors relate this to implementing ERP systems (Caglio, 2003; Scapens & Jazayeri, 2003), as they provide a standardized platform that automates accounting procedures and integrates business areas (Haddara & Zach, 2011). This has also resulted in an integration of the management accounting function, requiring increased knowledge of how the business operates on a cross-functional level while freeing up time previously spent on routine tasks to provide additional support to managers to add value to the organization (Caglio, 2003; Scapens & Jazayeri, 2003).

Several digital tools and systems that can affect management accounting are being used today. Cloud computing, Big data and analytics, and ERP systems are just a few examples. According to Sastararuji et al., 2022 cloud accounting is becoming an increasingly important business operating tool for SMEs, where cloud accounting can help SMEs become more efficient, financially organized, and flexible. Examples of cloud-based solutions can include several accounting functions like control reporting, analytics, monitoring, and data governance (Heinzelmann, 2019). Sastararuji et al., 2022 conducted an explanatory case study during the Covid-19 pandemic where they interviewed SMEs in Thailand. The authors aimed to investigate factors that influenced the SMEs that implemented cloud accounting. They discovered that internal needs triggered the adoption rather than external

information about cloud accounting. The main drivers behind the implementation were to improve efficiency, obtain real-time data, and increase mobility. The traditional accounting system made it challenging to keep track of the money flow, which meant that SMEs were unaware of who owed them money. Implementing cloud accounting made it easier for them to keep detailed track of their accounts payable, accounts receivable, expenses, revenue, and margins.

2.1.1 Management Control and Management Control Systems

Merchant and Van der Stede, 2012, p.8 describes Management control as one of three core processes that managers are responsible for, the other two being objective setting and strategy formulation. Management control can be described as the process that ensures operations are going according to the objectives and strategies set by management (ibid.). Management control plays a crucial part in the execution, as a good strategy and objectives can still fail without sufficient control, which is often the deciding factor in the results (ibid.).

Management control is separate from strategic control, primarily focused on examining the market and the organization's place within it to strengthen competitiveness (Merchant & Van der Stede, 2012, p.8). Instead, it is focused on the internal processes within an organization, mainly on how employees' behaviors can be influenced in ways that produce desired results based on the objectives and strategies set by managers (ibid.). Management control and management control systems are necessary to guard the business processes against human error by placing barriers or limiting interaction towards actions the organization does not want employees to perform (Merchant & Van der Stede, 2012, p.9).

Good management control is required for an organization to succeed with its strategies and objectives, and with good management control systems, managers can be confident that unpleasant surprises won't occur and that they can foresee the problems that eventually arise (Merchant & Van der Stede, 2012, p.12). The idea of perfect control is unrealistic, as it would require foolproof systems and processes that remove the possibility of errors (ibid.). This is unrealistic because there will always be some element of randomness due to human error, and implementing a system that provides perfect or close-to-perfect control would be so expensive that the costs greatly outweigh the benefits (ibid.). Instead, managers should prioritize gaining optimal control, which is when the costs of implementing more control are lower than the potential losses resulting from a loss of control (Merchant & Van der Stede, 2012, p.13). Failing to implement sufficient management control systems can have significant consequences; it can cause loss or impairment of assets, revenue deficiencies, excessive costs, inaccurate records and reports that impair decision-making, legal repercussions, or business disruptions (ibid.).

Management control systems improve collective decision-making in an organization (Bhimani et al., 2019, p.557). They can be defined as the method of gathering and using information that guides employee behavior and supports and coordinates the process of planning and coordinating decisions across an organization (ibid.). Well-designed management accounting and control systems should be built as a consistent, global, technical structure that allows for specific tailoring and adjusting at smaller local levels when required (Atkinson et al., 1997,

p.692). They should be flexible enough so that it is easy to make adjustments in a way that would foster learning and continuous improvement (ibid). An effective management control system at its' core is a tool that facilitates motivation for employees and managers (ibid.). In essence, they should promote goal congruence, which is the alignment of organizational goals with individual goals, and give employees the necessary drive to complete or even push past those goals (Bhimani et al., 2019, p.558). For this to succeed, a management control system should include the following:

Use of financial and non-financial data

To aid managers in making sound decisions aligned with the strategies and goals of the organization, qualitative and quantitative information should be used when needed for control, motivation, and performance evaluation (Atkinson et al., 1997, p.699-701). By using qualitative and quantitative data, organizations can adequately set up performance measurements based on the quality of the product or service and the costs of running processes (ibid.). Using non-financial performance metrics in tandem with financial metrics can improve the visibility of processes and intangible assets (ibid.). Additionally, they can be good indicators of future financial performance as the managers can view the progress of process improvement over time and improve the performance of managers by evaluating previous decisions (ibid.). They can, however, be time-consuming and expensive to implement as they require a lot of knowledge on the interdependencies within each business process and their effects on financial performance (Bhimani et al., 2019, p.586-587).

Ethical conduct

There should be systems in place based on the organization's code of ethical conduct that motivate employees to behave in a way that aligns with the goals of the organization (Atkinson et al., 1997, p.698). Reward systems based on performance can be a strong tool to encourage employees and align the goals of individuals and the organization. They should be included when designing a management accounting and control system (ibid.). The ethical control system should consist of descriptions of the organization's values and code of ethics to make it relatable to each employee's job while clearly stating their ethical responsibilities within their function (ibid.). Training and education are also essential to ensure employees are aware of potential ethical dilemmas in the workplace (ibid.). Ethical conduct should also be measured and evaluated so that employees are aware of their ethical conduct performance during performance reviews (ibid.).

Employee participation and empowerment

Control systems should allow employees to participate in both designing the control system and making decisions that affect them (Atkinson et al., 1997, p.702). They have valuable first-hand knowledge that is much more extensive than managers, and making sure that this knowledge is utilized is essential (ibid.). Asking employees for feedback and empowering them to make decisions that affect them and their business function can also be important to build motivation (ibid.).

Reward systems

Reward systems can be effective tools to motivate employees to align their self-interest with the interest of the organization (Merchant & Van der Stede, 2012, p.368). By building reward-based systems and linking them to specific activities or metrics, an organization can make it easier for employees to understand and emphasize the importance of those activities. This can be described as effort-directing. Another benefit to reward systems is motivation, where some employees need incentives to motivate them to perform at a level that management desires (ibid.). A third benefit is attracting and retaining employees that perform well. By offering performance-based incentives superior to that organization's competitors, they can also attract new talent (Merchant & Van der Stede, 2012, p.369).

2.1.2 Control Problem Avoidance

In addition to influencing employee behavior to increase control, it is also possible to implement control measures that reduce or remove the possibility of errors (Merchant & Van der Stede, 2012, p.13). This can be done in several ways, and new technologies can provide new opportunities (ibid.). This can be described as control problem avoidance and has four prominent strategies:

Activity Elimination:

Activity elimination is characterized by avoiding control problems and risks by outsourcing a particular activity or entity to a third party through subcontracts, licensing agreements, or divestments (Merchant & Van der Stede, 2012, p.13). An example of activity elimination is cloud-computing, which eliminates the need for maintaining and running server infrastructure or software within the organization, and instead relies on a third-party provider to deliver computing hardware or software for the services the organization requires (Merchant & Van der Stede, 2012, p.14).

Automation:

Automation is the use of computers, systems, and other means of automation to reduce the amount of human input to remove or reduce the possibility of errors (Merchant & Van der Stede, 2012, p.14). Automation of routine data-inputting tasks and analysis is one of the many selling points of ERP systems (Shehab et al., 2004), and other technologies such as Artificial Intelligence can also be used for automation (Heinzelmann, 2019). However, using these is usually not enough to remove the need for human interaction; ERP systems and other IT systems, for instance, still require some form of manual data input to function. (Heinzelmann, 2019; Merchant & Van der Stede, 2012, p.14).

Centralization:

Centralization of decision-making is both a common and an essential part of MCSs within nearly every organization (Merchant & Van der Stede, 2012, p.15). By implementing control systems that move decision-making responsibility to smaller entities, often upper management or entities closer to the business processes, the organization can reduce the risk of lower-level employees making poor decisions (ibid.). Some studies have investigated how ERP systems affect the centralization of control, highlighting how different implementation

strategies have significant differences in outcomes for centralization (Quattrone & Hopper, 2005).

Risk Sharing:

Risk sharing can be described as sharing different areas of risks with outside entities that can mitigate losses that happen through unwanted employee behaviors (Merchant & Van der Stede, 2012, p.15). An example of this is insurance, which protects the organization if an event occurs that causes the organization significant losses that it could not afford (ibid.).

2.2 ERP systems and Management Accounting and Control

Enterprise Resource Planning (ERP) systems are widely used among organizations throughout several industries today and have received much attention from practitioners and academics. An ERP system is a business management system based on several modules that integrate complex business processes, functions, and information across departments and functional areas within an organization(Shehab et al., 2004). Because of how the ERP system is integrated, the data is available in real-time for all personnel in the organization and is transferable between functional areas (Al-Mashari, 2003). It can support and deliver data and information between inventory, production, planning, materials, engineering, finance and control, Human Resources, logistics management, marketing, operations, and many other departments in the organization (Shehab et al., 2004). Because of the extensiveness of an ERP system's functions, implementation is time-consuming and requires significant investments by organizations(Shehab et al., 2004). This can be a massive undertaking depending on the complexity of the business and the level of organization and process control required, and the implementation can take several years before the system has reached a level of maturity to be able to provide decent results (Heinzelmann, 2017; Scapens & Jazayeri, 2003).

Enterprise Resource Management (ERP) systems have been a widely researched subject in accounting literature, and studies have shown that the implementation of ERP can facilitate organizational change, as well as cause changes in accounting methods and practice (Dechow & Mouritsen, 2005; Heinzelmann, 2017; Quattrone & Hopper, 2005; Scapens & Jazayeri, 2003). They can be utilized to provide opportunities for process restructuring and integrate the accounting function across the entire organization (Caglio, 2003). By restructuring their processes in a cross-functional perspective, organizations can shift their operations from having distinct functional areas towards a more integrated process-controlled way of operating, facilitating cross-functional collaboration and improving communication across business areas (Caglio, 2003; Scapens & Jazayeri, 2003). ERP systems have also been shown to improve prevailing accounting practice through increased visibility, standardization of practices, and data quality (Caglio, 2003; Quattrone & Hopper, 2005).

Standardization has been shown to cause challenges in implementation and practice but also has distinct benefits. Standardizing processes across an organization with several subsidiaries can be an important way to ensure common understanding to facilitate decision-making at the upper management level (Quattrone & Hopper, 2005). A potential challenge that can arise due to standardizing accounting practices is that accountants have less control over

how they can do their work (Caglio, 2003; Heinzelmann, 2017). This caused difficulties for the organization studied by Heinzelmann, 2017, as the accountants in several subsidiaries were unfamiliar with the accounting methods, practices, and guidelines that the ERP system required them to fulfill to produce reports of high quality. A consequence of this was an initial period of poor reporting post-implementation, which had to be resolved by management by training the accountants within the subsidiaries of the organization in "Germanic accounting logic," which are the accounting methods, practices, and guidelines inscribed in the SAP system that was implemented. In the case of Caglio, 2003, the accountants perceived a loss of control in their techniques and methods (primarily data-input, extraction, and project flow) due to the standardization that the ERP system caused. However, this was not perceived negatively by the accountants as the standardization also caused increased consistency in report quality and transparency, causing them to have more accountability in their reporting.

Empirical evidence also suggests that ERP systems have changed the roles of management accountants in organizations(Caglio, 2003; Scapens & Jazayeri, 2003). The study by Caglio, 2003 describes a case where the accounting function served a vital role during the implementation process due to the CFO's prioritization of management accountants. The result of this was an increased understanding of the accounting functions across the entire business and the accountants' understanding of the different business areas, illustrating a change in role as "hybrid" accountants with increased agency in the operational and managerial aspects of the organization. The study by Scapens and Jazayeri, 2003 showed similar effects that the ERP system had on the role and practice of management accountants, both as a result of the automation of routine tasks to free up time for value-adding tasks and as a consequence of requiring cross-functional knowledge to have sufficient control. The authors argue that it was not necessarily a direct result of the ERP system itself but that it acted as a facilitator of this change.

Dechow and Mouritsen, 2005 shows using a cross-case study of two different case organizations, how ERP systems have a techno-logic inscribed within them that describes how technology alters strategic priorities and structures. In their cases, they demonstrated how the limitations of the ERP system caused issues that management accountants have to go out of their way to solve. As problems are continuously solved, the system's complexity evolves, and what was previously a solution can become a problem further down the line causing an ever-evolving system where boundaries between financial and non-financial parts of the organization continuously changed.

In the longitudinal case study by Scapens and Jazayeri, 2003 the SAP-ERP-system implemented in a large US-based manufacturer of building materials acted as a facilitator for evolutionary change, building on previous ideas and initiatives from the headquarters and providing incremental changes for existing processes and routines. The transition from legacy IT systems to a centralized and standardized ERP system forced individual functions to communicate with management accountants, causing an integration of the financial function into other business areas. The ERP system caused four key impacts on the organization. Firstly, it eliminated the need to do routine jobs as the SAP system did this automatically, making it possible to reduce the size of the accounting function without a hit in productivity.

Secondly, line managers gained accounting knowledge due to the integration of the financial functions across departments and other business areas, and they were also able to take more responsibility for the financials within their areas. Thirdly, because of the routinization and computerization for many routine tasks, management accountants had more time to further support business managers, which was required because of their additional financial responsibilities. Lastly, management accountants needed broader knowledge of business as a whole rather than specific technical accounting knowledge because of how the ERP system cuts across departments. This was solved through cross-functional meetings enabling increased cooperation and a shared understanding of the functions within the different departments. As a result, it caused the management accountants to be more involved in managing the business than in an independent role.

2.2.1 Benefits of ERP

The literature has identified several potential benefits and functions that an ERP system provides to an organization (Maditinos et al., 2011; Scapens & Jazayeri, 2003; Shehab et al., 2004);

Automating and integrating business processes across organizational functions and locations.

By consolidating all data into a single IT system through each module, ERP systems can automatically do routine tasks that would otherwise require several layers of user input (Shehab et al., 2004). An example of this can be a customer order being placed, inputting data for a single product containing all requirements for the whole process from customer input to production, invoicing, and delivery. Streamlining the entire process across departments can save great amounts of time and increase transparency in the whole process (Maditinos et al., 2011). This has also been shown empirically in the studies by Scapens and Jazayeri, 2003 and Granlund and Malmi, 2002, where management accountants could provide additional support to managers because of the ERP system's automation.

Enable implementation of all variations of best business practices to increase productivity

As the ERP systems contain modules prepared by third parties with significant experience, they can provide opportunities for organizations that implement them to restructure their processes with known solutions within their industry to increase competitiveness (Shehab et al., 2004).

Share data and standard practices among the entire organization to provide an overview of the organization.

Because the ERP system shares and consolidates data in real time across the entire organization, this data is accessible and usable by all departments. This data can include financial and non-financial data, allowing managers and management accountants to more easily evaluate non-financial performance and get a broader view of the organization (Caglio, 2003; Spathis & Constantinides, 2004). This has also allowed companies to establish new profit centers, as data related to specific processes and products are more easily visible and attainable by management accountants (Granlund & Malmi, 2002).

Produce and access information in real-time to facilitate rapid and better decisions and lower operating costs.

Because all data is available to anyone in real-time, ERP systems can make it much easier to make well-informed decisions in shorter amounts of time without having to go through layers of communication to understand the current situation (Spathis & Constantinides, 2004). Because ERP systems provide standardized processes, workflows, and reporting mechanisms, they allow managers and decision-makers to quickly and easily view the organization's performance based on previous results and make decisions accordingly (Maditinos et al., 2011).

Improve coordination across functional departments.

Because the ERP system removes boundaries between departments through data consolidation, it can facilitate increased coordination across functional business areas. As evidenced by the case study by Scapens and Jazayeri, 2003, the ERP system facilitated cross-functional cooperation, which led to managers and management accountants having a broader view of the organization.

2.2.2 Limitations and Challenges of ERP in Management Accounting

Because of the complexity of implementing an ERP system, there can be many challenges related to both implementation and ensuring the organization is aligned with the data structure and inscribed processes. The rigid processes and data requirements within the ERP package can cause challenges and change the practices of its users (Heinzelmann, 2017; Quattrone & Hopper, 2005; Scapens & Jazayeri, 2003). This can cause more significant challenges in larger organizations when adopting ERP systems, as demonstrated by Heinzelmann, 2017 and Scapens and Jazayeri, 2003. In both these cases, a larger organization adopted SAP because of a requirement for a global system that standardizes, centralizes, and integrates activities and information across the whole organization. This caused challenges because of the system's rigidity, and because each department or plant had different requirements and processes, a misalignment of the established business processes in the organization and the SAP processes subsequently caused challenges for the subsidiaries with learning and using the ERP system the intended way. This caused tensions between employees that managers had to resolve. As demonstrated by these cases, this rigidity becomes a challenge when the system is met with user resistance, whether because of changes in processes and functions or differences in the user knowledge of the systems.

As the ERP system consolidates and transfers data across the entire organization, it is essential to ensure that data usage is similar across the different business areas (Shehab et al., 2004). Having separate business functions that use the same data sets can cause difficulties in some cases, and succeeding with integration where all the functions that require data can use the same data sets for their purpose can be an ever-evolving and continuous process (Dechow & Mouritsen, 2005).

The configuration and implementation process of an ERP system can significantly affect the outcome of the final solution, and the complexity of implementing a complete system that integrates all or most organizational functions into a singular system has been shown

to cause unknown challenges post-implementation (Dechow & Mouritsen, 2005; Quattrone & Hopper, 2005). Dechow and Mouritsen, 2005 studied two organizations where the integration process was primarily run by the IT and logistics departments in the organization. Because of how the ERP system was structured, the accounting practices and methods were determined early on as a foundation, while the system's logistics and operational parts were configured afterward. This made the system difficult to configure on the accounting side, as any adjustments would have ramifications for the rest of the system and were therefore not prioritized compared to the logistics function. The consequence of this was a rigid accounting structure that required manual workarounds by the management accountants so that they were able to fulfill their responsibilities, which caused data "blind spots" where it was difficult to verify and understand where data came from, resulting in a loss of control. In a similar cross-case study by Quattrone and Hopper, 2005, the findings showed wildly different outcomes between the two organizations due to their different implementation strategies for their systems. Both organizations implemented ERP systems because of their requirements to standardize processes and centralize control towards their headquarters. One of the organizations referred to as "Think Pink" experienced that the ERP system removed functional barriers and distances, making it possible for anyone to input data, resulting in a flatter organizational structure. This caused a decentralization of control as smaller centers of control were established and disappeared without the management accountants knowing. The freedom of inputting data also caused problems for the organization studied by Scapens and Jazayeri, 2003, where smaller errors caused cascading problems due to the system being integrated and lacking control functions to prevent the errors from being moved through the system.

2.2.3 Implementation of ERP

While the ERP system is a software package that provides several benefits, it also changes how people work by imposing structural approaches to business processes. The ERP modules are based on "best practice" solutions predefined by the external providers through their experience. In many cases, the "best practice" for one organization does not necessarily translate well to every organization (Quattrone & Hopper, 2005; Shehab et al., 2004). There is no "one-size fits all" solution for IT infrastructure because even though companies can operate within the same market with similar products and structures, their processes, working methods, and culture can be completely different. This is where the need for customization of the ERP system comes in.

Deployment of ERP systems is typically done in three different ways. It can be developed and maintained on-premise by the organization, in the cloud through a third-party service provider, or by using a hybrid solution where the computational units and the ERP modules are situated in both the cloud and on-premise (Grubisic, 2014).

Adopting ERP in an organization is a significant undertaking requiring great efforts across the entire organization. Several requirements should be fulfilled to be sufficiently prepared before beginning implementation. Rao, 2000 outlines some specific areas that organizations should prepare before implementation in the following list:

1. *Infrastructure resources planning*

   To ensure that all required infrastructure to support an ERP system is ready and reliable in time for implementation. This requirement is not necessarily relevant in all cases and depends on the deployment method of the system.

2. *Human Resources planning*

   Because the ERP system can affect the entire organization across all departments, it requires a lot of teamwork to ensure everyone is involved.

3. *Education about ERP*

   To reduce resistance to the implementation, educating people about how ERP works and how it can affect them is essential. ERP education should therefore be carried out to facilitate an understanding of ERP principles and effects, help mitigate resistance, and build a sense of its effects through demonstrating previous implementation cases.

4. *Top management commitment*

   Ensuring top management understands and is committed to change is essential for successful ERP implementation.

5. *Commitment to implement a "vanilla" version*

   This ensures that the ERP system is deployed as quickly as possible, focusing on customization after its effects on the organization is better understood (Rao, 2000).

6. *Strategic decision on centralized vs. decentralized implementation*

   It is essential to have clear priorities on how centralized the system should be before implementation. The case by Quattrone and Hopper, 2005 demonstrated how a centralized system can cause decentralization of control and how the implementation strategy dramatically affects how the system interacts with the organization.

The "ERP implementation process model" in the study by Maditinos et al., 2011 is a framework developed to describe the variables that affect the ERP implementation process through three dimensions: Human input, ERP consulting process, and consequence. The human input dimension contains variables related to internal and external support of the implementation, and the ERP consulting dimension includes variables that are likely to affect the ERP consulting process. Finally, the consequence dimension describes the effectiveness of the ERP system by end-user perception. Using this framework and statistical analysis, the authors found three crucial elements of ERP implementation. The first crucial factor is the support of ERP consultants, as having the right consultants for the specific business environment and implementation context can significantly affect the result. Therefore, the organization that decides to implement ERP should focus on finding the right consultants for their specific business environment, as the technical skills and a broad understanding of business practices that the right consultants have can be of great importance for implementation success (Maditinos et al., 2011). However, this support also goes both ways, as the consultants also require the support of company personnel to fulfill their tasks in the

best way possible. This coincides with the findings of Wang and Chen, 2006 who further elaborates that the quality of the consultants influences the level of communication effectiveness and conflict resolution. The second key factor for success in ERP implementation was knowledge transfer. A key element within knowledge transfer is preparation, training, and education of the effects of ERP in the specific business context, as insufficient or lackluster training can cause conflicts and tensions post-implementation (Heinzelmann, 2017). Maditinos et al., 2011 further argues that companies adopting ERP should build structures that help facilitate knowledge transfer to aid users in working within the processes of the ERP system and learning about their new organizational responsibilities. Ram et al., 2013 also found training and education as critical success factors for organizational performance when implementing ERP and argues that the benefits of sufficient training and education are present both during and after the implementation process. The third factor that Maditinos et al., 2011 found described how top management support is essential for successful ERP implementation. However, its effects on the final solution were less than consultant support and knowledge transfer, and it was also less important than the support of the users of the ERP system. Wang and Chen, 2006 also found that top management support is essential with ERP implementation by demonstrating a positive correlation with conflict resolution.

2.3 Cloud-computing

Cloud computing has rapidly emerged in recent years, presenting new ways of deploying, developing, scaling, and maintaining IT systems. It is defined by the National Institute of Standards and Technology (NIST) as:

"Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and comprises five essential characteristics, three service models, and four deployment models."(Mell & Grance, 2011, p.2)

It allows companies to quickly implement and use complex IT systems without requiring significant investments in data infrastructure, in-house development, and maintenance, as third-party providers can cover these areas on pay-per-use and service-based payment models (Fox et al., 2009).

The three service models referred to in the definition by NIST are Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

IaaS is based on computational resources being provided by a third party. Cloud-service providers can grant consumers processing power, data storage, cloud data transfer, and networking through this service model. Within this landscape, the user can define what hardware and software should be run, which operating system hosts the software, and the hardware specifications (Mell & Grance, 2011; Ruparelia, 2016, p.12).

PaaS allows users to deploy cloud applications using programming languages, libraries, ser-

vices, and tools provided by the cloud-service provider (Mell & Grance, 2011). As a result, companies adopting this service do not manage the hardware and infrastructure. Still, they can control the applications developed in the cloud through the service platform and sometimes the configuration of the hosting environment (Mell & Grance, 2011).

SaaS is a service model that supplies users with an application through cloud infrastructure. In this case, the user has no control over the infrastructure, such as hardware, networking, operating systems, storage, or applications (Mell & Grance, 2011). It is an end-user package that allows for rapid use of pre-developed software, with the disadvantage of having less control over the application itself (Ruparelia, 2016, p.12).

Ruparelia, 2016, p.13-14 further expands on the NIST definition of cloud computing by adding two additional service abstractions: BPaaS and INaaS. BPaaS can be described as an entire business function or process that is handled by a cloud platform instead of being outsourced to another entity. INaaS can be described as a cloud service that stores data (IaaS) but also manipulates the data to produce information (Ruparelia, 2016). IT enterprise architecture contains four domains: Business Architecture, Information Architecture, Applications Architecture, and Technology Architecture (Ruparelia, 2016, p.13-14). In Figure 2.1 the different enterprise architecture domains are linked to their respective cloud service models. Technology architecture contains IT infrastructure, middleware, and operating systems. Applications architecture includes software applications and their interactions and relationships with business functions and processes. Data architecture has data assets and how the data is organized and managed, and business architecture links the business strategy to an IT strategy along with a framework for governance and the business processes within the company (Ruparelia, 2016).

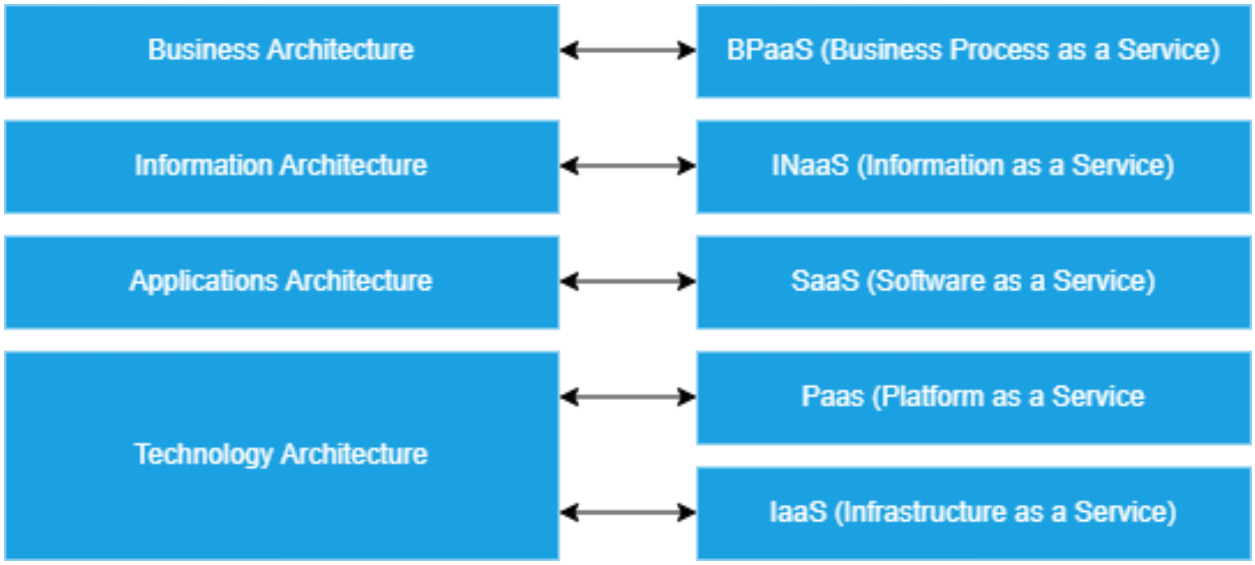

Figure 2.1: Enterprise architecture stack and cloud service models (Ruparelia, 2016, p.14)

The use of Cloud Computing enables organizations to continuously update and maintain cutting-edge technology with pre-packaged tech solutions to increase efficiency, reduce costs, integrate their IT systems, and scale their business (Marston et al., 2011; Strauss et al., 2014). By centralizing processing powers in larger data centers, the operating costs for computing

services can also be significantly reduced (Fox et al., 2009), opening up opportunities for smaller organizations to take advantage of cheap-and instant processing power. This reduces the entry cost for smaller firms to adopt business analytics tools and systems that were previously limited to larger corporations, enabling them to implement and utilize these tools effectively (Marston et al., 2011). Additionally, cloud-computing grants significantly increased accessibility of services as they are available from any location at any time (Strauss et al., 2014); however, they also come with the risk of potential outages that are not within the organization's control (Fox et al., 2009).

Data security is one of the most prominent concerns for organizations considering adopting cloud technology (Elmonem et al., 2016; Strauss et al., 2014). In the study by Strauss et al., 2014 on the effects of cloud technology on management accounting and business decision-making, 66% of respondents in a survey that chose not to adopt cloud technology did so because of data-security concerns. This can, however, be attributed to a misconception of risk because of public perception rather than factual reasoning, as large third-party providers of cloud solutions have significantly higher data security than what is possible for SMEs with their limited resources, making the data security higher than it would have otherwise been (Strauss et al., 2014).

Chapter 3

Method

In this chapter, the rationale behind the decisions made in this thesis will be presented. The research method and how the data collection was approached and analyzed will be described. Limitations will be included to highlight factors that could weaken the quality of the data collection.

3.1 Research method

The thesis started with a common interest in digitalization. Based on digitalization, we began to conduct further research by reviewing articles. The path in constructing our final research question was challenging due to the large amount of literature on digitalization. We reviewed different subtopics within digitalization, specifically cloud computing, big data, and AI. After this, we felt that cloud computing was an especially relevant topic today, and we were intrigued by the implications that it can have on organizations and decided to explore different topics within cloud computing. With the suggested themes provided by our supervisor's documents, we chose to write about ERP, specifically Cloud ERP.

As the next step, we began to summarize research articles about the implementation of ERP, case studies, critical success factors when implementing ERP, benefits and challenges of CERP, and other general information related to CERP, management accounting, and control (MAC). After an initial review, we established MAC and ERPs as our domain theory, see (Lukka & Vinnari, 2014). Much research is related to ERP systems and organizational change within this domain, specifically changes in management accounting practices and managerial control (Heinzelmann, 2017; Quattrone & Hopper, 2005; Scapens & Jazayeri, 2003). This was an area we were interested in, and it helped shape our research question:

> *How has the implementation of SAP affected the organization and management accounting practices?*

This research question was initially based on how the Cloud ERP system affected the organization, but when reviewing the data, this was changed to how the SAP system changed the organization, as the data showed that it had much more significant effects on our case organization.

To answer our research question, we decided to use a case study as our primary design. This is because case studies allow researchers to draw holistic interpretations of complex phenomenons given the specific organizational context and can be an important tool to evaluate management accounting practices (Scapens, 1990). They can also play an important part in contributing to practice while identifying new avenues for research to be investigated that can produce new theories (Cooper & Morgan, 2008). Therefore, the complexities and nuances derived from case studies can be very valuable for researchers, even though some argue that case studies are difficult to generalize due to their contextual setting, as shown by Flyvbjerg, 2006. This thesis investigates how an IT system with several interdependencies within a single organization affects the practice of management accountants and the organization itself, which we identified in the literature review as a complex, context-based problem related to practice and people. Case studies are a relevant and effective methodology for researchers investigating complex phenomena that are not easily quantifiable, details regarding practice in real-world scenarios, and context-dependent phenomena (Cooper & Morgan, 2008). They are also well suited to answer "how" and "why" research questions (Scapens, 1990). With our research question and domain theory established, answering our research question using a case study seemed highly relevant. We contacted different organizations to establish our case and selected our case based on relevance to our research question.

Authors have defined the characteristics of case studies in different ways to seek a generalized description of what they seek to achieve and how they do so. Scapens, 1990 defines these characteristic generalizations as "descriptive", "illustrative", "experimental", "exploratory" and "exploratory" case studies. Our case seems to fit into the exploratory and explanatory definitions from his descriptions. The main characteristics of an exploratory case study defined by Scapens, 1990 is that they seek to explore why accounting practices are done in a specific way given the case context and are generally used to build ideas and hypotheses to explain reasons for those practices. Explanatory case studies are similar to exploratory case studies. However, they base themselves on existing theories to explain why and how accounting practices relate to existing theories and hypotheses. Cooper and Morgan, 2008 defines the different types of case studies as; "Extreme/deviant", "Maximum variation", "Critical", and "Paradigmatic". From his definitions, the "maximum variation" type of case study also seems to fit the most into our case as they are characterized by studying a single phenomenon through a case that is different in some dimension from previous literature. The phenomenon being studied in this thesis is the impact of ERP systems on organizations and management accountants, which has been the subject of several other studies. Our case is different in its organizational context, which is unique because every business has different employees, processes, systems, and cultures. These unique factors are the main reason case studies like this one are difficult to generalize, but there are still overarching themes that can be recognized with the holistic approach of the research.

3.2 Data collection

3.2.1 Anonymization

Anonymization of the participants is a requirement to include when managing personal data. The personal data of the participants in this study is protected by The Personal Data Act. Personal data include direct and indirect data that make it possible to identify individuals. Typical personal data can be name, address, phone number, pictures, and audio recording ("Personopplysninger | Datatilsynet," 2019). Despite not using these personal data, individuals can still be recognized through enough indirect personal data. It is, therefore, essential to limit the amount of indirect data. In our study, we have therefore chosen to anonymize the company we write about, and we will keep the job title of the participants private. The Personal Data Act applies when it is not possible to identify individuals through both direct and indirect data.

Alongside anonymizing personal data, an information sheet was provided to the candidates. It was essential to specify that participating was voluntary and that they could withdraw at any time without an explanation. The candidates were entitled to get an insight into the personal data we managed, and get a copy of the personal data, correct inaccurate or misleading personal data, delete personal data, and file a complaint to Datatilsynet if they were not satisfied with the management of their personal data. The interviews could not take place unless the candidates agreed to be interviewed. To proceed with the process of the interviews, a data management plan had to be approved by Sikt.no. The data management plan and the project proposal submitted in February for this thesis were approved by Sikt.no. This ensures that personal data is managed with a certain level of quality control. Measurements taken to ensure data security included using the software tools provided by the University.

3.2.2 The Qualitative Interview

Qualitative research methods are essential in case studies, where researchers seek to understand the complex variables between systems and organizations and how they affect people and practice (Bubaker, 2016). Within qualitative research in accounting, interviews, direct observation, and document collection are widely used as data sources to investigate the research problem. They are particularly relevant when studying phenomena such as organizational change (Hoque et al., 2017, p.432-433). Qualitative interviews are described by Qu and Dumay, 2011 as a powerful tool for researchers to capture experiences and practices. The literature review gave us insight into how complex the effects of implementing an ERP system are, and to explore the impact on both the organization and management accountants, we found qualitative, semi-structured interviews to be most relevant to capture the complexities and nuances within our case organization and to answer our research question. The semi-structured interviews allowed the interviewees to share their thoughts and experiences while staying within the subject. Qu and Dumay, 2011 details the purpose and usage of semi-structured interviews: "The semi-structured interview involves prepared questioning guided by identified themes consistently and systematically interposed with probes designed

to elicit more elaborate responses" [p.9]. They allow additional freedom to the interviewers to follow up on answers that might be surprising or particularly interesting during the interview process to receive more detailed accounts. This means that the interviewers help shape the conversation during the interview, causing different interviewers to produce different data sets with the same interviewees (Qu & Dumay, 2011).

We used an interview manual for each interview to guide the interviewees, which can be found in the appendix. These manuals were sent to each of the interviewees beforehand so that they could familiarize themselves and prepare for the questions beforehand. We had four informants from different positions in the organization to get insights from separate functions, and a total of 7 interviews were conducted. Two of the informants were managers, and two were IT staff. Each informant was interviewed individually, with specific questions or topics being addressed to the interviewees based on their background and knowledge. At the beginning of each interview, we briefed the informants by introducing ourselves and the aim of our study. This is an integral part of the interview process, as the researchers ensure that the interviewee understands the study's objective and that the interviewee still wishes to participate given the context (Brinkmann, 2022, p.63). We initially asked open-ended questions during the interview to allow the informants to discuss the different areas of interest broadly. We followed up with more focused questions when they touched on a subject of high relevance or when additional elaboration was needed. This is common when utilizing semi-structured interviews to minimize research bias and to allow the interviewees to deliver personal recounts of their experiences (Qu & Dumay, 2011). Because of the open-ended nature of the semi-structured interview, researchers have to pay attention to ensure that the interviewee stays within the scope of the study (Vaivio, 2008). We noticed this during our discussions, but this was not an issue as the interviewees mainly stayed within scope. The duration of the interviews ranged from 25m to 1h10m, and they were all recorded for transcription.

3.2.3 Data Analysis

The initial transcription process involved using language recognition software to translate the audio recordings into text. However, the software's translation was rough, so we had to adjust the unstructured data once we received it. To accomplish this, we carefully reviewed the recordings alongside the transcribed data, rectifying any mistakes and organizing the data to align with the interview questions.

To enhance the analysis process, we color-coded the interviews based on the interviewees, enabling us to identify who said what quickly. This allowed us to compare the responses to the core questions easily. Furthermore, we consolidated all the interviews into a single document to provide an overview of the entire data set. After thoroughly reviewing the initially categorized and color-coded data, we further coded the information into main sections describing the narrative of the case organization and their implementation process, along with the key areas we investigate in this thesis in organizational change and management accounting.. This gave us a complete overview of the entire case narrative, and we could quickly compare the thoughts and experiences of our interviewees to analyze our data and

compare it to previous empirical results.

3.3 Limitations, Credibility, and Validity

Credibility refers to how researchers can convincingly convey the results during the study and are based on the quality of the empirical data and how likely it is that the researchers have correctly interpreted the data according to theory (Hoque et al., 2017, p.433).

Our case study is retrospective as the data is based on changes that occurred in the past, where the central phenomenon we study began back in 2015 and has been a continuous process since then. We conducted the interviews at a singular point in time after several changes had been made, and some of our interviewees were not present during many of the organizational changes. This affected the level of detail that could be gathered from some of our interviews. Still, on the other hand, it also allowed for more reflection from the interviewees during the changes as the long-term changes in the ERP system were more visible.

Longitudinal studies are generally more credible, as data is collected during several points, often spanning many years of changes (Hoque et al., 2017, p.433). Studying the process of organizational change as it happens would give us additional insight into the different nuances as data would be comparable from one point to the other, detailing challenges, transitions, and eventual resolutions. This was impossible in our case, as the timeframe from starting and completing the study was only five months. We could only have follow-up interviews with two informants because of time and scope constraints, and our data would have had higher quality if the study duration had been increased as we would have had more time for follow-up interviews to receive more data.

In the initial discussions with our case organization, we requested reports and internal documents to verify and further increase the validity and credibility of our findings through data triangulation (Ahrens & Chapman, 2006). This was not provided, making it difficult to validate the data gathered, a potential weakness in this thesis.

The informants we interviewed joined the company at different times in the implementation process, and some could not discuss the main challenges and changes being made in depth. This has affected some of the data that we gathered. Still, we adjusted our interview guide to account for this and directed questions toward people present before and during the implementation. Additionally, we could not interview any management accountants, making receiving data on their practices challenging. The data we did receive on their practices were mainly general observations and second-hand recounts of their experiences. As our research question is directly directed toward management accountants, it is difficult to verify the credibility of the findings. Yet, the organizational change aspect was widely documented.

Scapens, 1990 discusses how the data extracted from interviews are a reflection of both the interviewees' validity and credibility, but also the interviewers researching the phenomenon. As we decided to use semi-structured interviews to gather more descript data on key insights (Alvesson, 2003), additional emphasis is placed on the interviewers to follow up on the right

questions to generate richer data quality (Scapens, 1990). Due to our limited experience as interviewers, this has potentially reduced the quality of data we were able to gather in our interviews. The main complication related to this would have been to utilize our limited time with our interviewees more efficiently, as there were some moments during the interviews where they went slightly out of scope.

Chapter 4

Case

The company we have done a case study on in this thesis is a large organization. To anonymize the organization, we named it Food Manufacturing Company (shortened to FMC).

The organizational structure consists of top management with several production sites nationwide. The production sites are responsible for their production operations, given that they meet the objectives set by the top management. Farmers from all regions of the country provide the production sites with eggs and animals. In the production sites, they decide how to slaughter and utilize the animals in the best possible way without wasting unnecessary parts of the animals. Their major production groups are beef, pork, chicken, eggs, turkey, mutton, lamb, and goat.

In addition to the production sites, the company possesses various subsidiaries specializing in processing surplus materials derived from their primary production. The excess materials that are not meant for human consumption are incorporated into their circular processing economy and become animal food, medicines, high-value protein supplements, and bio-energy.

FMC is one of the largest food producers in their country, with thousands of employees. The farmers are scattered throughout the country with various production and climate conditions. They function as the foundation for the company, where tasks such as cultivating the soil, sowing, reaping, and managing the sheep movement. The owners of the farms are quite occupied with managing the farms, which is why they have established a cooperative. There was a need for an entity to manage the transport, slaughtering, and further distribution and sales.

The company is a major supplier to the grocery market, and its products are sold in all of the country's grocery chains. Additionally to the grocery stores, their products can be found in hotels, commercial kitchens, petrol stations, restaurants, and raw materials for other meat industries. Still, their three main customers are three large wholesalers. Their ability to distribute their goods in several markets has given FMC a strong market position.

The company has adapted to expectations and requirements to foster future-orientated food

production and maintain its market position. Their sustainability strategy has been established through extensive consultations consisting of stakeholders from agriculture, authorities, academia, customers, and civil society, and analyses of research reports examining the environmental effects of agriculture. Their sustainability strategy is described in six dimensions: safe and healthy food, food on nature's premises, contributing to viable agriculture, responsible production, care for people and animals, and collaboration with stakeholders. The strategy is created by utilizing the UN's ten principles for responsible business and engaging FMC to future growth and competitiveness by the UN's goals for sustainable development. They must collaborate closely with companies, authorities, research, and civil society to achieve their objective.

Alongside the company's sustainability commitment, FMC places equal focus on animal welfare. The company adheres to national frameworks and standard procedures for managing the well-being of the animals. However, farmers have the primary responsibility to ensure that animal welfare requirements are followed. The company requires that farmers monitor and document animal welfare through the animal welfare programs and the Quality System in Agriculture (KSL). The company's advisers and vets provide advice and guidance on how the farmers can develop and improve the operation and animal welfare. In addition to guiding the farmers, they contribute to industry-wide training courses, trade meetings, and organized training activities. For instance, the advisers participate in the company school, where digital training for pig producers related to Food Safety is provided.

The animal welfare program is a framework for systematically documenting and improving animal welfare. This program demands regular veterinary visits and requires a follow-up on any deviations. For FMC, these programs are essential tools for farmers that enable them to secure animal welfare in their production. If they fail to follow the KSL and the animal welfare program, the farmers will encounter financial penalties and exclusion from commodity flows.

Moreover, the Quality System in Agriculture is a standard and internal tool designed by public regulatory requirements. KSL is an approved device by the food safety authorities as a national industry standard. Farmers must conduct self-audits every year to assess their production practices. Additionally, their production may be inspected physically to ensure they align with regulations and industry standards.

In addition, FMC has established its procedures for identifying poor animal welfare. The procedures are derived from data and information obtained from the value chain, such as slaughterhouse observations. If the company discovers issues regarding animal welfare through these procedures, they will be addressed. They aim to detect welfare problems before they develop. The procedures are, therefore, to assist the farmer in preventing challenges with animal welfare and to correct any weaknesses in animal welfare. FMC offers advice to improve animal welfare or by contributing to resolving any problems before they worsen. If farmers do not resolve the issues, the consequences may be financial sanctions or exclusion from commodity flows.

Further control measurements adopted by FMC are mandatory training for all employees

handling live animals to slaughter. After completing the necessary training, the employees receive a certificate of competence from the Food Safety Authority. All personnel at the production plant are responsible for animal welfare. Still, they have additionally designated an animal welfare officer who is responsible for ensuring that all the requirements and rules for animal welfare are followed.

The drivers of the animal transport vehicles in FMC must also possess a certificate of competence. This is because FMC is responsible for ensuring that all the employees in the company who handle animals are updated. Therefore, FMC drivers must complete a refresher course every three years.

FMC is a complex organization which has required comprehensive control systems. In addition, their numerous production sites have different production lines, different types of sensors, control sheets, differences within each location, and differences in the employee's needs and history, requiring a reasonably extensive infrastructure to manage the complexity. Their organizational structure has brought on some challenges during the implementation of SAP, which will be elaborated on later in this chapter. Figure 4.1 shows a simple timeline of their organizational journey from 2015 to 2023.

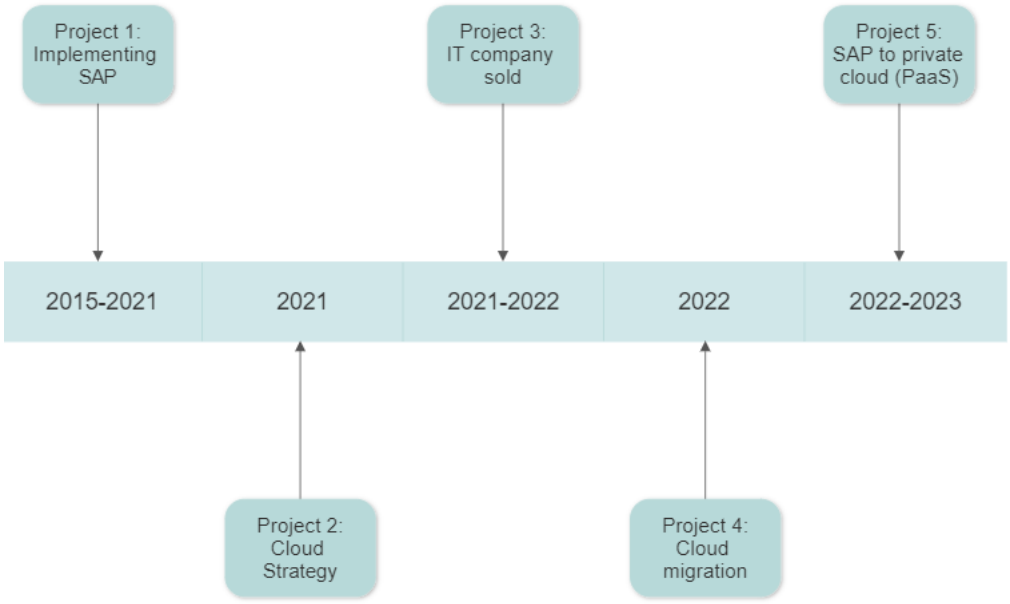

Figure 4.1: Timeline of the organizational journey

They transitioned from the old Axapta system to SAP in the first project. Axapta handled the processes within production and logistics, while several other support systems, which are now incorporated in SAP, were utilized. Additionally, FMC had all of its financial operations in a system called Formula. Axapta was an outdated ERP system that needed to be upgraded. The implementation of SAP lasted from 2015-2021. During this period, they phased out several applications and established integration into all shop floor systems. The production sites use the shop floor system for their operations. After implementing SAP, the second project occurred in 2021, where the top management created a strategy and high-level road map toward the cloud. A system was needed to adapt to changes and efficiently

satisfy the hardware capacity for rapid changes that occurred in the business. Further, in 2021-2022 the company decided to sell its IT company to a consulting and business company, resulting in a new IT service provider. In the fourth project, which took place in 2022, they prepared for an improved ERP version called S/4HANA and cloud migration. Lastly, in the fifth project from 2022-2023, they moved their ERP system from on-premise to private cloud (PaaS) and finished the project in February 2023.

Before the first project, the company had a pre-project before implementing SAP. The pre-project started in 2014 and consisted of two phases where they decided on the choice of technology in the first phase and which implementation partner they wanted to use in phase two. After the pre-project, project one was planned to start in 2015 and be completed in 2018. As seen in the Figure 4.1, the first project lasted three more years due to several delays. One of the factors that caused delays where due to several change orders to maintain the wholeness.

Chapter 5

Results

The SAP project replaced the old Axapta system and Formula. FMC intended to deliver the first project in four phases, from phase 0 to phase 4, where phase 0 was the finished design.

The implementation plan for the SAP system involved a sequential approach, where support processes were prioritized and implemented first, followed by the main production processes. Human resources (HR) functionality was scheduled for phase 3 of the implementation after the initial phases. Phase 4 of the implementation plan focused on improvement activities, particularly related to planning and the effectiveness of finding solutions. This phase aimed to enhance the system's capabilities and optimize its performance.

In reality, the phases were more extensive and required the establishment of additional phases. One reason for the delays was the lack of timely readiness of the solutions, which hindered thorough testing with sufficient and high-quality data. They had to establish phase 1,5 during the initial phase to implement all the necessary support processes. Further, phase two was also divided into 2a, 2b, and 2c. Consequently, the original plan of dividing the implementation into four waves had to be modified. In practice, the roll-out was expanded to eight waves, each comprising additional deliveries. This adjustment was made to accommodate the challenges faced during the implementation process.

> "There is a good lesson in that it is difficult to move and take too large parts of the process. It can be sensible to focus early in the project on the implementation strategy where a project contract is submitted, regardless of the format." (Manager 1)

FMC learned quickly that they could not expedite the implementation phase. One key issue related to the implementation was the significant emphasis on determining the choice of functionality rather than developing a comprehensive implementation strategy. This tendency was common for larger ERP projects, where the main focus was often on the solution. Consequently, the company needed to divide the initial phases into multiple parts to complete the testing and commence the operations.

FMC has undergone several significant changes in its enterprise IT architecture since 2015.

The changes began with adopting SAP because of requirements for a more standardized system that properly integrated the different functions across departments and subsidiaries. As mentioned, This implementation lasted six years, with project completion in 2021.

5.1 From Axapta to SAP

Before implementing SAP ERP, FMC used a variety of fragmented systems that were not integrated across all business functions. They used separate systems for long-term forecasts, short-term forecasts, production and logistics, finance, and reporting. This made it difficult for management to get an accurate overview of the entire organization. Before the SAP ERP system, they used a self-developed ERP system tailor-made to their business processes, with the primary user interface being based on Axapta.

At that time, the ERP system was divided into production and logistics, several support systems, and financial accounting. The financial aspect was referred to as "Formula." An adoption was made from both "Formula" and Axapta to SAP, which integrated production, animal control, and finance into a single system instead of having them as separate entities.

FMC's processes and organizational structure are complex, and because of this, they had an extensive pre-project review of requirements for their ERP system. These requirements were then advertised to different ERP providers. The company had to be selective in choosing their ERP system due to its production processes. FMC has aging and cooling processes that must be incorporated into one system. Additionally, they have numerous subsidiaries responsible for processing animal skins, and converting waste into valuable products. FMC manages multiple specialized processes within its production system, each dedicated to handling specific aspects of the overall production process. The choice of SAP was therefore not a random occurrence, but a result of an extensive consideration process due to the complexities in the company.

> "We started by looking at what we need a new system for. What should the new system do? We made a list of specifications with about 3000 requirements. We made a giant contract with about 2,500 pages, and went to the market and asked who would deliver this. We ended up evaluating different systems, and found that SAP was closest to what we could use within our industry." (Manager 2)

The implementation phase could commence once the company chose SAP as their system. The following section will present our findings regarding the implementation phase.

5.2 Implementation

FMC had a core team on every implementation to deliver training to the factories preparing to implement the SAP ERP system. They received training before they adopted SAP. The presence of good consultants and advisors was critical to a smooth implementation, and their understanding of the core business was essential to give precise and accurate training. When customizing the SAP system, the company experienced differences between proactive and more reserved consultants and advisors. The proactive consultants and advisors implemented

SAP as it should be, continuously making decisions regarding the progress. In contrast, the reserved ones followed a more cautious approach, often relying on checkpoints and taking less initiative. The reserved consultants relied more on guidelines for implementing SAP than allowing for more customization.

Their factory implementation phase lasted for two and a half years, which served as a learning process moving from factory to factory. The practical execution was compared to a checklist created in advance where actual processes related to the implementation and necessary re-adjustments to the previous system were made to point in the intended direction. The most significant learning was discovering how to extract these processes and adopt SAP while replacing the old system. Initially, they began with small factories to gain proficiency in adoption.

> "For new animals, it's new data problems or new solution problems that need to be solved. It's related to the functionality of the expedition and making sure that the storage functionality and storage management, and different sub-processes specific to the different factories, were handled." (Manager 1)

They started to target the easier factories to gain control and familiarize themselves with the standard solutions. Once they gained sufficient knowledge, they initiated more complex and challenging solutions at the larger factories. This approach contributed to an increasingly rapid implementation phase even with the higher demand of heavy processes in the more complex production facilities.

They had to adapt the SAP system to align with the physical slaughter line, starting from the disposal line. However, an essential factor for the company was to adjust its processes to fit the SAP functionality rather than the other way around. Before implementing SAP in each plant, they conducted two or three factory visits. The first visit was done to teach employees working in the factories about SAP, while the other visits involved key personnel that knew the solution and were dispatched to analyze the factory's operations. The key personnel analyzed and performed a detailed examination before the ERP supplier visited the factories. By employing this approach, they managed to get further discussion regarding the solutions. The processes were designed in a manner that revealed fewer and fewer challenges as you moved further. They conducted a fit-gap analysis, creating a list with 30 bullet points to gain insight into the details. They also encouraged factories to modify their approach to solve these process aspects. After going through the points, they discovered there were only 7 points that needed to be developed. However, this approach was an example one of the participants brought up and not a standardized form they used.

There were divergent views from the different leaders related to the implementation of new processes. The company created leadership courses that some leaders prioritized while others held a more reserved attitude. Contrary to the employees that had to start practicing these processes and were more curious, the leaders were more concerned about reporting and reports.

> "They don't work operationally in the system, and they don't think that the processes are very important. They have to understand the changes in the processes,

and how they affect the reports, and so on. Or the tasks, the work tasks, the work distribution." (IT Staff 1)

Despite the diverse areas of focus, the company was still determined to implement SAP. In the following section, we will outline our findings regarding the drivers for the SAP implementation.

5.3 Drivers for the SAP ERP implementation

FMC had several drivers to adopt SAP from their previous ERP system and IT infrastructure. The complex organizational structure of FMC made it necessary to simplify the operating situation to maintain administrative control. In the ever-evolving realm of information technology, the potential implications of using outdated systems became evident as they faced the possibility of overlooking emerging paradigms and integrations.

> "The constantly changing field of IT meant that we risked missing out on newer paradigms and integrations if they spent too much time on old systems. Perhaps, especially on integrations, which is something we saw as a big challenge." (IT Staff 2)

Another main driver was that the previous self-developed system was used outside of other IT applications causing the processes and data to be fragmented, making it difficult for managers to understand the organization. The need for a single system across the entire value chain was crucial to getting a better view of the different processes to plan production more accurately than before. The centralization would allow FMC to restructure their production planning from a purely production-based perspective to a more sales-oriented one.

In the past, their primary focus was on production. However, the main motive behind implementing a new ERP system was to redirect their focus toward having sales signals that primarily govern their processes. When farmers bring their animals, they are obligated to accept them and try to align the reception of animals with the corresponding sales signals. So the balance between matching production with demand and ensuring optimal utilization of the animals received from the farmers was very important as FMC does not have direct control over the raw materials they use for production.

> "We want to optimize the use of raw materials, but it's a significant challenge to balance what we receive from farmers with what we want to achieve with the products. And to also have an optimal utilization of the raw materials we receive." (Manager 2)

Today, their primary measurement revolves around their ability to adhere to the production plan. The plan is formulated based on the demand for their products and the intake of animals. The focus is on balancing input and output rather than solely emphasizing the production with a metric like kilos per hour. However, they face a significant challenge in ensuring that people comprehend this aspect. Many individuals are apprehensive about losing the information they relied on in the past to control the processes and adapt to the

new metrics. **Figure 5.1** below is a revised version of the internal documents we received from FMC that illustrate the difference in focus areas from production to a sales-orientated perspective.

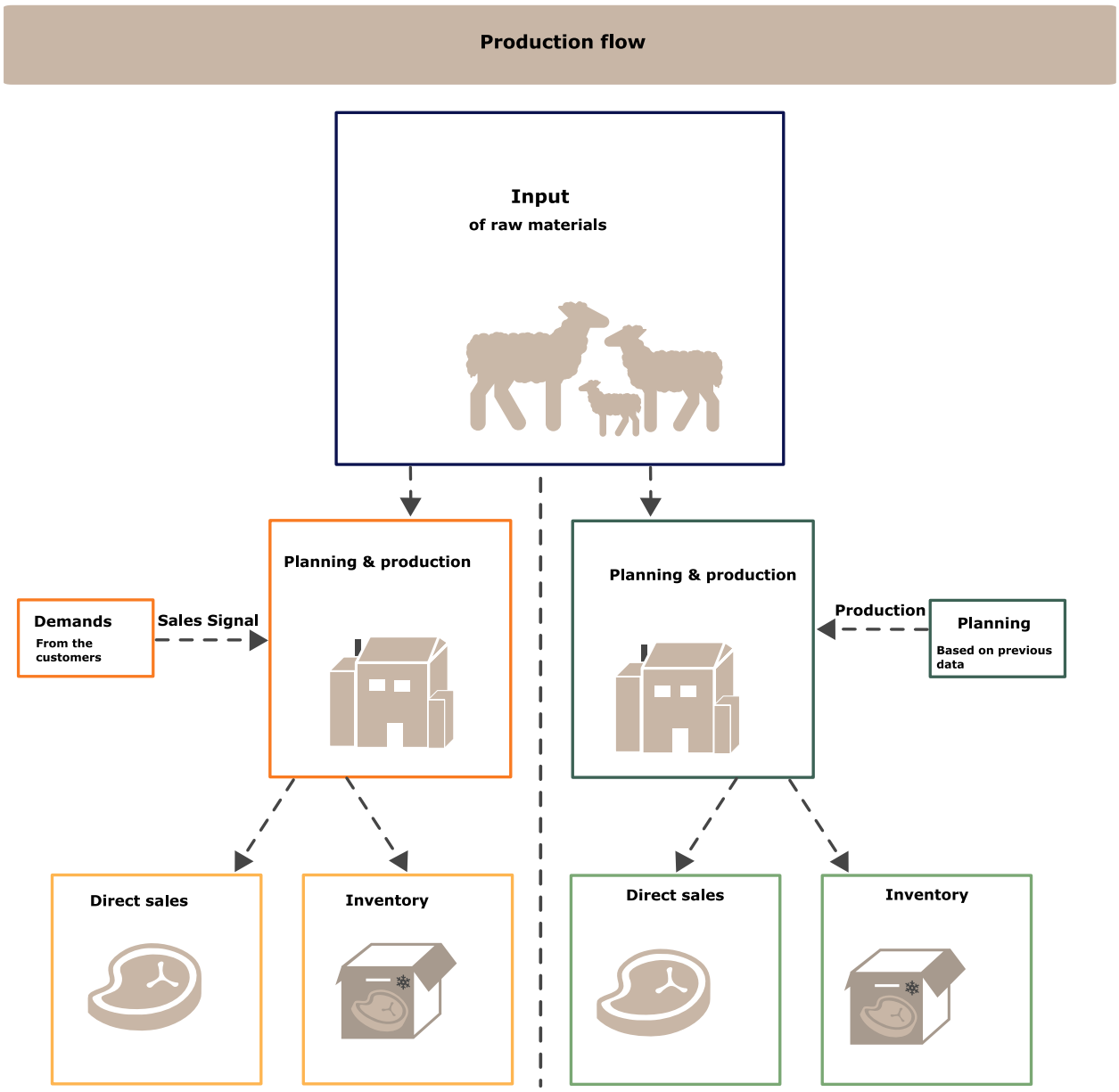

Figure 5.1: Simplified production line graphic

They intended to start using new KPIs and methods to improve the results for FMC. The practice of the new KPIs would ensure more accurate production at the right time despite a possibly slower production. Generating a more precise mix of products would be more profitable than producing goods in large quantities without being able to sell all of the products. However, practicing the new KPIs is still challenging due to the desire to keep the old ones. As a result, there is no consensus on all the new KPIs.

> "The organization is so complex that it's not just a technical project, it's also a business project, requiring a completely different way of thinking than someone used to previously. Not everyone understands this or is willing to accept the consequences. When describing what you would want in a new system, you tend to describe the old one as realistically and as accurately as possible; even if you try to be open to other solutions you tend to automatically describe the functions of the old system when discussing requirements." (Manager 2)

Several people preferred the Axapta system, but it was challenging to update because of its complexity. It was understanding the different system components before making changes that posed challenges. The customized processes before SAP had to be re-adjusted and formalized to fit the SAP system. Understanding the documentation of these customized solutions was a significant challenge. There was abundant documentation that contained unwritten details from developers because they assumed they were apparent. This caused confusion for others that were not familiar with the customized processes. Consequently, subsequent individuals who attempted to make changes or understand the situation could not grasp the complete picture. Over time, their knowledge of the operational situation decreased as more customized solutions were made. This caused significant delays when modifying changes in the previous system, as understanding the documentation was time-consuming.

> "The drivers were both a gain in new technology, but also to secure operation through an updated technology under usage. To eliminate the old technical debt in the system, which was completely self-developed. It was a value in itself to get similar processes in FMC across all facilities. FMC has been built up through many fusions, from different single slaughterhouses that have merged to regional slaughterhouses that have become a cooperative. There have been different processes, solutions, and systems, which have been the basis for how the different factories have handled their problems." (Manager 1)

Standardizing the design and describing the processes for functions, in addition to better technical documentation with SAP, has therefore been a huge advantage. In the following section, we will present the organizational changes resulting from the SAP implementation.

5.4 Organizational changes as a consequence of the SAP ERP implementation

As a part of implementing SAP, FMC has made several organizational changes. They have established a master data department, new sales and operations management department, profit centers, and process owners. A master data department was established due to the SAP system's higher demand for master-data quality. It was a requirement that the master data needed to be uniform across the entire organization, which was not the case with the Axapta-based system.

In the SAP system they currently use, the requirements for master data are entirely different.

The level of precision required is much higher. If the data is not within the system's tolerance, progress is halted until the data has been corrected. Accurate master data is emphasized because it enables precise reporting, storage, and complete control over their systems. In contrast, in the old system, they believed their master data was satisfactory. However, it became apparent that the new system did not accept certain elements that the old system had allowed.

Before FMC implemented SAP, they had increased flexibility in how their master data was handled due to fewer inter-dependencies across departments and the business. Each person in their respective factory was able to input their master data. With SAP, the data used in each process is now company-wide, and a new department had to be established to ensure the quality of data inputs and a consensus on the data that should be used for the goods produced.

> "Once you begin implementing master data company-wide, rules must be established and agreed upon within the company. What should the data for certain goods include? How should it be done? What values are acceptable, and what are not? It's a lot of work. Additionally, when you calculate an item, there are several separate steps. So, we have two different systems with distinct methods of calculating product costs. How do you match those systems, and match them in the middle of a process?" (Manager 2)

A challenge related to master data was the implementation from Axapta to SAP. While one factory calculates their production cost at a specific price, a factory in a different geographic location can calculate the same good at a different price. There is another cost calculus on the identical product based on the geographic location, which causes difficulties when adopting a new system like SAP. Their challenge has therefore been to solve this without affecting the customers.

Furthermore, a new sales and operations department was established. The new department is in charge of planning. There were planners before the existing department, but their focus was narrowed to deciding the quantity to produce and planning according to that. In contrast to the previous planners, the current department makes decisions regarding the specific goods that should be created. The new department monitors sales signals and takes action when needed. Based on the sales signals, planners need to determine the demand and how they can meet it using the available supply of goods.

In addition to establishing a new sales and operations department, new profit centers were founded. The new profit centers distinguish three different business areas: red meat, white meat, and slaughter that produces red and white meat. However, establishing the business areas is not a direct consequence of implementing ERP due to the process developing every year regardless of SAP.

Another establishment done by the company is creating process owners. As part of being a process owner, they participate in the process owner forum, where they collaborate to make processes flow seamlessly. The implementation of SAP has mainly impacted the establishment of processes to flow undisturbed.

> "Before, you had people who had responsibility for a part of a process, but now we have an official person who has a responsibility for each process." (Manager 2)

The organizational changes that have been made regarding the adoption of SAP have affected the company significantly. A common factor mentioned among the participants is the dependencies the SAP system entails.

> "We see that they are much more dependent on each other. You could not decide something on the sales department and think the general office team would handle it. You have to sort the process and agree on how the changes should be made. And when a change is made, for example, on the master data side, you must agree with those who use the same master data. So, there's a much more integrated, larger collaboration. " (IT Staff 2)

The SAP system makes the collaboration more integrated, whereas if an employee wishes to change the master data, they need consensus from everyone using the same master data. A further contributing factor the SAP system brings is the change of processes related to raw materials. Unlike before the adoption, where there was a department responsible for raw material delivery, the SAP system has allowed the company to let that department cooperate alongside the sales and operations department. As a result of this cooperation, the two departments plan the supply together. This has also resulted in increased visibility of where the cross-functional dependencies within each process lie.

> "Cooperation across the departments is much better, and there is a much greater predictability because you have higher quality data across the departments." (Manager 2)

As mentioned earlier, the established master data department has secured a certain level of data quality, whereas the data requirements in the old system were less strict. In practice, a department can not commence a task until the previous department has completed the primary task correctly. The interaction between the different functions has become crucial in the SAP system.

> "The interaction has been significant because you must get everything to flow seamlessly." (Manager 1)

Before the SAP system, departments made individual decisions within their functions regarding the goods to be produced. Contrary to before the adoption, they are now required to ensure that all aspects of the production, including the work plan, bill of material list, and requirements list, are properly registered and in place. If these aspects are not in order, they won't be able to start production.

As a cause of going from a self-developed ERP system like Axapta to a standardized SAP system, an individual's choice of picking preferred data is limited. The old system allowed more agility in extracting selected data, while finance and management largely set the data influence in the SAP system.

To summarize, the company has undergone significant organizational structure changes when implementing SAP in the last years, like the establishment of master data, new sales and operations management departments, profit centers, process owners, and a change towards a standardized system. In the next section, we will present the challenges FMC has posed during the implementation and the post-implementation phase.

5.5 Challenges in the implementation and post-implementation phase

FMC experienced a certain degree of resistance when implementing the SAP system and post-implementation. The resistance reached a point where employees gently sabotaged their contribution to prevent a seamless adoption. A few employees strongly desired to keep the old Axapta system and continued to cause obstacles during the implementation period. These obstacles consumed a lot of time and energy. These people in the organization were firmly against the SAP system and were not convinced that the SAP system was better than the old system. As a result of the resistance, a few people from the company decided to quit.

A significant contributing factor to this resistance was that many employees in FMC have been working there for 20-30 years, and they have made several decisions throughout the years. This caused them to have a lot of authority within the company, and they would rigorously defend the decisions they had previously championed. It became a cultural challenge to revisit long-standing choices due to them being heavily supported and deeply ingrained in the company culture. As a result, experienced personnel were resistant to changes in operational decision-making processes.

The power balance within an organization was disrupted by changing the ERP system, which affected both competence requirements and decision-making processes. This change introduced something new and unfamiliar, resulting in the loss of control for those who previously held authority over their work. Consequently, resistance became evident, as is typically observed when new systems are implemented.

The upper management took measures to address this and minimize the resistance. Corporate leadership, including the CEO, discussed this and forced the implementation despite the resistance. Key personnel who got on board contributed to the adoption in the factories. Out of fear of both the resistance and the lack of progress, the management made decisions despite not having everything ready in some cases. The existing resistance had the potential to exert power and hinder progress, resulting in challenges due to the lack of full employee engagement and alignment.

The first implementation at the first factory failed for several reasons; the main issues that caused the implementation to fail were:

- The lack of data from the old system was converted to the new system
- The solution was insufficiently tested
- Hidden data errors that would not be discovered even with an additional three months of testing.

The unsuccessful implementation of the project can be attributed to several factors, including inadequate project management methodologies, poor risk management and assessment practices, limited self-evaluation, and organizational psychology issues. The management team inaccurately evaluated their progress and overestimated their accomplishments, leading to a false sense of achievement.

> "It was also related to organizational psychology; you often come into a theoretical state where it was a collective thought towards "we can, we know, we want." This, together with the fact that the solutions were not finished, did not finish the testing, making you take action when you shouldn't. There had already been several postponements. It was a fear that you would not reach your goals if you could not do anything and did not take action." (Manager 1)

They had to re-establish the implementation. One of the informants described this as driving at full speed without complete control. They encountered several challenges during the project that they could not cope with. However, the challenges were not significant enough barriers to stop the project in practice. Nevertheless, the first implementation had partly affected the view of SAP. Eventually, the company managed to get control of the implementation, but the introduction of SAP made it clear that the adoption required a certain amount of competencies and other requirements. The failed adoption clarified the need for a common understanding of how the data model should be used and the data flow across functions. Despite a failed initial implementation, the adoption positively affected the learning and experiences gained from the incident.

> "An implementation plan was put in place. A structure was put together for decision-making in advance of all factory rollouts. As a result, SAP was rolled out on all of our facilities. We had to postpone some rollouts." (Manager 1)

> "We had to control some processes we did not have in place in the aftermath of the first delays. The implementation in the other factories was not problem-free, but we had successful implementations with ongoing production in mind." (Manager 1)

The initial failed implementation of the SAP system influenced the decision-making process, as the organization felt a sense of urgency to proceed. Risk assessments were conducted, assuming that non-critical components could be overlooked if they did not yield the desired outcomes. However, this mindset proved ineffective in practice, as decision-making was driven by a strong desire for successful implementations, as expressed by one of the participants. Gradually, the company transitioned from incomplete control to gaining control over the implementations. Efforts were made to address potential delays in the implementation, and the project management continuously adjusted the plan accordingly. The project management team comprised selected corporate directors, such as the chief of production, head of logistics, and economy manager, along with a representative from the supplier and a factory manager. By involving the factory manager in the project management, the company was able to gain valuable perspectives on the challenges faced from a factory standpoint.

> "It was probably to some extent, the project management had no insight into the

> details of the project. And the project management had a lot of control over how we ran the project. And I often think that is something that works. Because it is simply if you are going to detail everything and explain everything to someone who sits on a corporate management level, you will never get there." (Manager 1)

One of the participants highlighted the significance of formal support, decision-making, and maintaining control in the project to achieve success. Furthermore, fostering a seamless collaboration between the customer and the supplier was identified as another crucial success factor.

The implementation of SAP has had a significant impact on the organization. Employees in the organization were required to learn the new system and processes, which entailed new competencies that did not initially exist internally. An essential aspect for FMC has been training and developing existing employees to practice the new system parallel with maintaining business processes seamlessly. However, new processes, new staff, and changing the working method have brought challenges to the company. The challenging part has been securing sufficient training and their work in organizational changes.

Shortly summarized, the main challenges during the implementation period were training new processes, how new processes should work, and changing the data model and data quality. Additionally to these factors was the understanding of the complexity of an integrated system which was said to be a challenge in the long run. Likewise, understanding how changes and how they worked on the production line directly affected the economy. If the company had the resources as intended with the created implementation plan, they could utilize their resources and the suppliers better.

The initial plan for FMC was to have three independent implementation teams without the need to share resources across teams. However, this plan was not possible as there were only enough resources available for one and a half teams. With additional resources, time, and expertise within the teams, FMC could have achieved more significant benefits and utilized their suppliers more effectively. Unfortunately, the required expertise and resources were not available. The following section will present how SAP has affected the company's IT infrastructure.

5.6 IT Infrastructure

Before implementing SAP, they ran their old Axapta system on-premise. They utilized the user interface of Axapta with their custom-made back-end system. The old Axapta system was specifically developed to meet the company's needs. After the sale of the IT company, the organization established Corporate IT, which is a smaller group of people with specialized knowledge. At the same time, their new IT provider supplies all the primary services.

> "FMC's new role in this is to be a premise setter. To have architectural knowledge and knowledge of supplier management, which is my responsibility, knowledge of FMC, knowledge of where we want to be, business architecture in different areas,

project management, that remains in FMC." (Manager 2)

In addition to their new role as a premise setter, they have specialists who follow through on who can program and operate. Alongside their new IT infrastructure, the SAP system FMC uses today is crucial as it manages all aspects of animals, production processes, results, invoices, and delivery notices.

For FMC, the SAP system needed to fit their operational processes regarding the production and distribution of products to the stores. The SAP system has played a pivotal role in this process, extending beyond the scope of an ERP system. With thousands of employees, FMC has had numerous processes that require efficient management to rid themselves of the technical debt that accumulated before SAP.

After the implementation of the SAP system, there was a need for modernization and updating functions that were neglected during the adoption. A vast cleaning process related to cloud deployment started after the implementation. They wanted to modernize the entire IT platform, and it wouldn't be logical for the company to integrate only certain parts. The logical move was therefore to migrate everything to the cloud.

The migration of all data systems to the cloud was essential to ensure seamless integration, enhance the flexibility in their IT requirements, and provide them with easily accessible ways to scale their informational needs. The second factor contributing to the migration of the data systems was the enhanced operational privileges supplied by SAP, which turned out to be a significant advantage for FMC. It enabled the company to focus primarily on their business processes, which were the aspects that concerned them the most. These factors were the primary driving forces behind the company's decision to migrate to the cloud.

The cloud migration allowed the company to outsource the operational tasks of running their servers to Microsoft, as they are using Azure as their platform. Additionally, Microsoft offers many of their applications as software as a service, which means that FMC is responsible for the data and the usage of these applications while Microsoft maintains the applications, the database, updating and patching the engines, and other necessary tasks to ensure that the applications function properly to deliver the services they require. A common issue related to IT systems is the increased complexity, which can get out of control if it is not managed carefully. With their numerous production sites with different procedures and differences within each location, the employee's needs and history require an extensive infrastructure to manage the complexity. Therefore, FMC decided to simplify their operating situation to maintain control.

They desired to shift from maintaining the servers themselves and gaining more flexibility in using their computational needs, where servers are automatically spun up and shut down when needed. Their goal was to let the consulting and business company who bought their IT company elevate the SAP system to the cloud.

All operational and programming tasks must be completed in the public cloud through a web browser. Their current IT practice uses the Azure platform, which displays their operations' status and allows them to create instantly available applications across the entire

organization. The use of Azure has allowed the company to utilize the resources that they need more efficiently. With the help of programmers, FMC can create small programs that predict the weather, which affects their strategy for sales of certain goods. For instance, if the program predicts several sunny days in a period, they can decide on increasing products where the demand will be significantly higher with good weather. A similar approach can be transferred to forecasting and planning for upcoming seasons throughout the year.

> "One of the things that is important to us is the prognosis. For example, predict what will happen when the barbecue season will come. To plan, if you are going to eat pork for Christmas, they have to start planning that in January. Otherwise, they don't have enough pork ribs available. You have to start planning it at an early stage, because you have to use the whole animal." (Manager 2)

The company has always had planning mechanisms, but they are more efficient now because of increased data accuracy and additional capabilities as a result of SAP. Their focus is to develop improved solutions for data-driven decision-making. The company wants to be an established data-driven company and have that as their primary objective. A data-driven company includes the opportunity to have access to the correct data available at every stage of the decision-making process.

When the company decided to move their SAP system to the public cloud from the data center, they didn't have sufficient time to utilize the functionalities provided by Azure properly.

> "We had to just copy the content from our servers to Azure and specified the virtual environment we needed with certain specifications. Of course, SAP has created new systems that take advantage of cloud-resource allocation and service packages, but it's a longer path to take. So when we decided to move our systems up to the cloud, SAP told us that we have a step-by-step model that organizations that want to utilize the cloud-computing resources can follow." (IT Staff 2)

The process was a logical approach toward a cloud solution, which was determined early on to be economically feasible. Through further discussions, they agreed with the ERP consulting firm and the IT service provider that the company wanted to initiate the cloud migration. Their chosen ERP consultancy firm is responsible for the ERP system, while Microsoft handles their databases and IT platform through Azure.

Overall, the company's system has remained unchanged or segmented as before, but the difference is the transfer of the operational aspect to SAP and its move into the cloud platform. This transition enables a smoother process if there is a decision to replace a component with a more cloud-compatible alternative. As a result, the company can start rebuilding its infrastructure into a more cloud-based operation. **Figure 5.2** below shows a simplified illustration of their cloud-platform migration based on internal documents that were obtained from FMC.

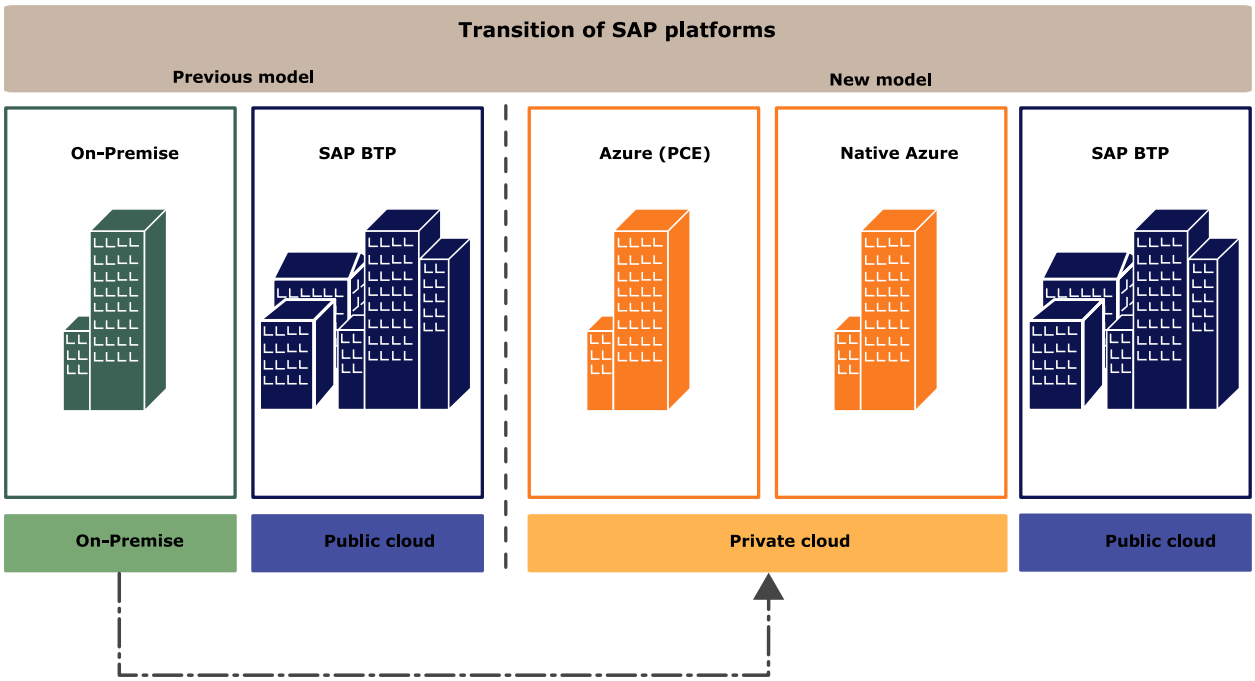

Figure 5.2: SAP platform shift

5.7 Changes in Management Accounting

Before implementing SAP, FMC used several separate control and accounting systems. Financial accounting used their own system, long-term forecasting and short-term forecasting had their systems and production and logistics used their previous ERP system for their operations. Most of these systems were self-developed or developed in response to requests from the company. Standard systems were difficult to find during the time these systems were established. As a consequence of the lack of standard systems, the systems they used were based on the processes and procedures and had been developed and updated for years.

The informants found it difficult to answer whether implementing SAP as the new technology platform caused a significant change in management accountants' roles and required competencies. This is primarily due to a minor change of responsibility for management accounting and the FMC's intended plan to change or adjust several principles within economy management throughout the project.

> "Those who worked with management accounting before the SAP are the same people as after. They have learned a new system, and they use it differently. And get to have additional functions and other information types gathered. But on a base level, the SAP system has not caused a revolution in practice, but perhaps an evolution." (Manager 1)

However, the implementation of SAP brought significant changes related to processes. The primary difference from the first project was the introduction of joint processes throughout the whole company and its facilities. Regarding the financial aspect and the financial follow-up, the SAP implementation has not considerably changed the role of management accountants.

Management accounting has a very clear controller function in the organization, reporting to the Chief Financial Officer (CFO), and is supported by a network of resources from the different departments within FMC. They are organized in a matrix structure and function as a heavy support function in all corporate areas. Management accountants in FMC work closely with corporate management and various corporate locations. For instance, if the controllers are mainly responsible for controlling the production, they are a part of the production management team within that subsidiary or department. Management accountants are responsible for different control areas as part of corporate management and have played a key role when implementing the SAP system.

Nevertheless, the controllers preferred the old systems during the adoption of SAP, and it was a desire to keep and control the old systems through the old processes. The controllers didn't hold a negative attitude toward introducing new processes and the change of processes in the organization, but instead, they did not fully understand what was happening. In practice, as a cause of the new processes, the role of management accounting in the company has been cemented rather than changed.

A significant difference with SAP in contrast with their previous ERP system has been integrating the accounting systems into the shop floor system. The shop floor gathers data on the quality of the animals, meat, fat, percentage of damage, and other parameters. These parameters are used to provide farmers with a calculation basis. FMC evaluates the animals by following fixed rules for the valuation of the animals and sends the calculation basis back to the farmers. This reverse-invoicing method is pretty unique to this industry.

> "We get the animals first, then we evaluate the quality, and then we send out a calculation basis that the farmer gets, which is their invoice documentation." (Manager 2)

The SAP system in their domain is complex and includes more than controlling financial information. In addition to financial data, the management accounting function holds animal and production information. For instance, the machine time spent on producing a specific product, packing time, and quantity of materials. Target parameters are then established on the factory level and collected in the SAP system.

Information integration improved the established control systems related to tracking at FMC. To produce meat or food products, it is essential to maintain full tracking and control because of regulatory requirements. This means knowing the specific farms where the animals came from. During the butchering process, it is essential to maintain control over every part of the animal throughout the entire production process. In the event of any issues, such as bacterial contamination, it is essential to identify the batches involved, as the government will force a complete recall of all products unless the specific contaminated batches are identified and recalled. The level of process visibility and handling of data they have with SAP has been helpful in this regard.

An additional impact the SAP system had on management accounting is related to the relationship between the organization's controllers and production management. SAP has increased the efficiency of communication related to reporting and the flow of information

from the shop floor system to management. However, the introduction of SAP has affected the control function and made them rethink how they operate in some areas, which has been a challenge for FMC. The production managers can control their factories and make decisions based on the production. Still, the control function does not always agree with the proposed methods and sometimes has to intervene and list their requirements to retain control.

> "One of the challenges has been, how do you go from the old system to the new system while managing to keep a way of calculating it that makes the cost of goods as correct as possible" (Manager 2)

There are 70 controllers in the company, making it challenging to have a consensus on whether a solution works, as several differences must be addressed before deciding on a specific answer. The scale and complexity of the SAP system make it challenging to take care of these aspects. The problem has not been solved yet in FMC, and it is not likely to be solved within the next few years because of the time it takes. Despite not having all the problems solved yet, the company has reached several goals and is changing towards a positive direction with better economic control and processes.

The decision to slaughter animals in one location and transport the animal groups to another location for further processing is an important point to consider. The centralization of information, improved information gathering, and enhanced connectivity of these objects are vital for the organization. It is not merely based on accounting reporting principles but focuses on effectively managing the value chain and overall business operations.

Regarding data entry, the SAP system is much more rigid than before, and the level of precision by employees is higher. If mistakes in data entry are made, correcting them can be a time-consuming process. An eventual error will cause a chain reaction that affects the processes further down the line that rely on the same data. Having an awareness of this is therefore essential throughout the whole organization. Still, less reliance is placed on each employee as mistakes that were not caught in the previous system are now being seen by machines. When the data entries are performed correctly, management accountants can extract more precise and higher-quality reports. The factory managers possess greater control now due to more time spent on data. The new system compels FMC to operate more rationally, actively seeking out and identifying opportunities for improvement within the value chain. This includes addressing issues such as overcapacity and waste and identifying obvious errors in existing processes. This ability to identify and address areas of improvement is perhaps the most significant advantage SAP provides.

The most significant advantage related to management accounting is the possibility of getting better and more details in cost monitoring. The system also provides more accurate cost monitoring, and several standard procedures exist to perform this. However, the challenge for FMC is to link the management accounting information to how it works in real life with the value chain. The company operates within two primary market segments, which are the grocery chain market and three large wholesalers.

> "We sell to industrial customers, we sell to the big grocery chains, and everyone

> has their own requirements, and everyone has their own agreements. It is therefore important to control what we should pay back and give discounts to the big daily goods chains or wholesalers, to minimize losses. And especially the production part where we have reporting and integration based on the daily production." (IT Staff 1)

They are pressured to deliver low prices to the customers. The SAP system allows the company to gather information directly from the production and the planned production cost to analyze. Data gathering was possible before, but the SAP system has connected the economy with the individual side elements and components. Everything can be visualized with one recipe and one bill of materials used. The system doesn't allow the controllers to adjust the cost unreasonably without considering production and effort factors associated with quantity or cost.

> "You can't adjust the cost of a product just to adjust the cost, but you have to adjust which production factors are included and what the effort factors with quantity or cost. That's the big advantage of SAP, that it is connected to the actual production so you can take out the information. You have had the information before, but not connected as one object used across." (Manager 1)

Additionally, several controllers in the organization track the business as their primary responsibility. They are responsible for making decisions regarding accounting numbers and evaluating them. FMC does not solely rely on accounting numbers for decision-making purposes but rather uses them as a basis for recalculating the economic implications of production. Instead of utilizing the accounting module postings in SAP, FMC employs a calculation method that considers the actual meat consumption. This approach allows FMC to better understand the financial implications associated with their production processes. This information can pinpoint whether adjustments to the budget are needed.

Chapter 6

Discussion

In this chapter, we seek to compare and discuss our empirical results with the theoretical framework provided. The findings employed in this chapter are essential to answer our research question alongside the corresponding theory. The chapter is structured into four sections: ERP, challenges, IT infrastructure, and management accounting. Each section aims to explore SAP's effects regarding these four aspects.

6.1 Implementing SAP ERP

Our interviews confirm the broad claim made by SAP ERP vendors to be a real-time and integrated solution. This feature has been crucial for fostering the collaboration between the shop floor system and the top management as it enhanced the production planning process. The benefit of the ERP system aligns with the study by Quattrone and Hopper, 2005, who revealed shared real-time data across the entire organization, increasing the organizational visibility for the companies.

Additionally, data centralization has led to heightened integration between the different departments. This adjustment has required a thorough understanding of how changes impact the organization. For instance, they discovered that the work performed on the production line directly affected the economic function. The close collaboration across the different departments has fostered greater predictability due to improve data quality. SAP enabled the company to gather information directly from the production and the planned production cost to analyze. Another outcome of the integration is the cooperation between raw material delivery and the sales operation department. Unlike before SAP, where the two functions operated separately, they now cooperate in planning the supply to meet the demand.

The case of FMC sheds light on how ERP systems can be drivers for organizational and process change, as studied in Scapens and Jazayeri, 2003. During the past seven years, FMC has undergone several significant changes in its IT infrastructure and operations, with the most notable differences being the transition from an on-premise, self-developed ERP system to a standardized ERP system on a cloud platform by SAP which is the focus of this thesis.

The transition has facilitated several changes in the organization. Most notably, the estab-

lishment of two new operational units in the Sales and Operations department and a master data department. The re-established sales and operations department aimed to utilize data to control production more efficiently as the ERP system allowed for increased product visibility. Because FMC has no control over its raw material reception for producing its products, this has been an essential part of utilizing the capabilities of the new ERP system. Additionally, the data integration across subsidiaries allowed FMC to shift its focus from a production-based perspective towards a sales-orientated outlook where measurements are taken based on sales signals. The sales signals provide the basis for production planning, allowing the company to make more accurate decisions regarding product demand. Instead of focusing on high-volume production, which may result in a surplus of goods, they can now produce a more precise mix of goods that reduces inventory and increase the outflow of their products that provide the highest profit.

Implementing SAP has increased visibility throughout the company by clarifying where the connections and the dependencies are. If an employee wishes to change the master data, they need consensus from everyone utilizing the identical master data. The enhanced visibility in the ERP system was also shown to have benefits regarding identifying and controlling production batches. FMC operates in a market with strict laws and guidelines regarding its product quality because of regulatory requirements in the food industry; this has been a crucial aspect of its success.

Besides the improved visibility, the production and work process has also been influenced by SAP adoption. To initiate the production practice now, the company needs to have all the necessary aspects of the production in place before commencing manufacturing. This includes the work plan, the bill of materials, and the requirements list. The same approach applies to the master data, a department can not commence a task before the previous department has completed the preceding task correctly and the inputted data is within the tolerance levels of the system.

It can be argued that the ERP system allowed FMC more control over its entire production process. This is primarily due to all the necessary data inputs that must be verified and agreed upon during every step of the production process as a cause of the standardized SAP system compared to the self-developed system they previously used. The previous system allowed individuals more freedom when inputting data into the system. Still, it lacked standardization and uniformity across the entire organization, which reduced the control for each process. Standardization and uniformity were, therefore, one of the main rationales behind the establishment of the master data department. Their old Axapta system was less strict regarding individuals extracting preferred data, while the SAP system makes it difficult for employees to make errors when treating data. In addition to the standardization, the implementation of SAP has caused the company to establish process owners. In contrast, in the previous practice, where individuals in the company were responsible for a specific function, FMC now has designated owners for each process to ensure that processes flow seamlessly.

According to Haddara and Zach, 2011, Scapens and Jazayeri, 2003, and Shehab et al., 2004 there is an agreement that an ERP system integrates complex business processes. The ERP

system obtains real-time data for all the functions in an organization and is transferable between functional areas. Further presented in Chapter 2.3 is the comprehensive implementation an ERP system can require. Adoption of SAP is time-consuming and requires significant investments (Shehab et al., 2004). As noted by Heinzelmann, 2017, implementing an ERP system can take several years, depending on the complexity of the business. This aligns with our observation in FMC, which successfully integrated the different functions into one singular system. The process of implementing SAP throughout FMC occurred over six years. SAP enables the company to extract real-time data and utilize it to improve decision-making, particularly in their production-planning processes. However, it is crucial to consider that the company implemented SAP in all their factories, including the corporate management, and not limited to one workplace. Undoubtedly, the implementation of SAP in FMC has been time-consuming due to their complex organizational structure with their subsidiaries which corresponds with the study case done by Heinzelmann, 2017.

The previous Axapta system was heavily customized to the company's processes and procedures developed throughout the years. Updating the system was difficult due to all their customized processes. However, the standardized nature of SAP has improved the company's understanding of processes significantly compared to Axapta, where the lack of knowledge of the processes caused massive delays. Scapens and Jazayeri, 2003 and Heinzelmann, 2017 provided empirical evidence in their case studies that the global ERP system posed challenges due to standardizing, centralizing, and integrating activities and information across the organization. However, FMC experienced better solutions related to the processes as a cause of the standardization.

Our case presents less drastic organizational changes than previous research in this field, as presented in Quattrone and Hopper, 2005 and Dechow and Mouritsen, 2005. The primary reason for this is caused of the circumstances related to the implementation of ERP, as our case organization previously had an ERP system that was tailor-made and customized by the organization itself. The main organizational changes were driven by the standardization and data quality requirements that came along with the more standard SAP package. In contrast, the case by Quattrone and Hopper, 2005 illustrated drastic changes in organizational structure and control in one organization that previously did not have an ERP system; our case is more similar to the other case in the same study, where the functions and processes were cemented and prevailing practices were improved. Our findings are also similar to the study by Caglio, 2003, where prevailing practices were improved, and the management accounting function was cemented in the organization rather than drastically changed.

Adopting SAP as an integrated system at FMC has brought several benefits and facilitated organizational and process changes. Participants recognized SAP's real-time information capabilities, enhancing collaboration between shop floor systems and top management and improving production planning. Data centralization has increased integration between departments, allowing for better control of production batches and regulatory compliance. The transition to SAP has also led to establishment of new operational units, improved visibility, and greater control over the production process. The standardization and uniformity of SAP have reduced data discrepancies and allowed for the designation of process owners to ensure

seamless processes. Implementing SAP has been time-consuming and investment-intensive, enabling FMC to make more informed decisions and optimize production planning. The standardization of SAP has improved the understanding of processes compared to the previous customized system. While the organizational changes at FMC have been less drastic than other studies, implementing SAP has driven improvements and cemented existing practices. The enhanced process visibility has also allowed FMC to establish profit centers, similar to the findings of Caglio, 2003.

6.2 Challenges of ERP implementation

FMC has faced challenges in both the implementation and post-implementation phases. The decision to adopt SAP at FMC caused some resistance, with employees vehemently opposed to the new system, and some even quit. This friction between top management and those who preferred the old system created obstacles and hindered cooperation. By implementing ERP, the organization's power balance encountered disruption, impacting the competence requirements and decision-making processes. Introducing something new and unfamiliar resulted in a loss of control for those who previously had authority over their work. Consequently, resistance emerged, a common occurrence during implementation of new systems. The resistance was primarily passive, mirroring findings from Caglio, 2003 regarding the lack of cooperation in similar situations. Experienced employees, who held considerable authority within the company, were at the forefront of this resistance due to their deep-rooted attachment to the established practices at FMC.

Following the implementation, employees had to learn new processes and acquire competencies not readily available internally. This posed challenges for the organization, including sufficient training and supporting employees during organizational changes. While Heinzelmann, 2017 has previously highlighted similar post-implementation training challenges, direct comparison is difficult without specific information on the core training and learning obstacles in our data.

Despite the resistance, the strong commitment of top management to adopt SAP played a significant role in the implementation process. Educational training provided to employees and factories resulted in divergent attitudes toward SAP, with managers focused on reporting aspects and employees adopting a more curious stance. FMC's emphasis on seamless implementations necessitated extensive post-implementation cleanup processes. Overall, adopting SAP at FMC brought about resistance and challenges but highlighted the importance of management commitment and careful planning to ensure successful implementation.

The new adjustments for the company as a result of SAP were perceived as obstacles. The understanding of the complexity of an integrated system and how changes and work practices on the production line directly affected the economy manager. Maditinos et al., 2011 argues that organizations adopting an ERP system should learn about their new organizational responsibilities. In FMC, they quickly noticed that the new SAP system was highly dependent on the other departments and had to adjust their working method accordingly. For instance, if they wanted to make changes regarding the master data, they needed consensus

among everyone using the same data. They could no longer make decisions within their separate function and had to consider the other departments considerably more. Similar implications were discussed by Scapens and Jazayeri, 2003, where issues had to be resolved at the cross-functional level, and a consensus between the different business functions was required before moving on.

The initial implementation of SAP was unsuccessful due to inadequate preparation and an overestimation of progress. This highlights the importance of a well-prepared implementation plan for successfully adopting SAP. The organization's failure to understand the complexities of the SAP system and the lack of universal buy-in from employees contributed to a challenging implementation process. The impact of human input, including internal and external support, on the implementation process is discussed by Maditinos et al., 2011. It can be argued that a smoother implementation could have been achieved if all employees had been fully onboarded from the beginning.

However, the primary reasons for the failed implementation were poor preparations and the absence of effective project management in advance. The commitment of top management to implement SAP was evident through leader courses and the establishment of core implementation teams in each factory. The consequences of the failed adoption had a lasting impact on the company. Eventually, the organization gained control over the situation and developed new routines for subsequent implementations. One of the benefits of this working method was the production of high-quality reports from the SAP system, thanks to strict requirements for data quality. However, rectifying mistakes in the system proved to be a slow and challenging process due to the interdependencies involved (Maditinos et al., 2011).

According to Maditinos et al., 2011 mention, the right consultants are essential for implementation success. Our case demonstrates the importance of this; our results showed a clear difference between good consultants and more reserved ones. The good consultants were more proactive and made decisions regarding the progress in the post-implementation, while the reserved ones held a more forced attitude towards the educational training. Knowledge transfer is as crucial as good consultants. Heinzelmann, 2017 mentions preparation, training, and education of the effects of ERP in the specific business context as critical elements for knowledge transfer. As the consequences of poor training and education, especially when new processes and practices are required, can cause conflicts and tensions post-implementation. An introduction of SAP and training was provided to the factories before the implementation to teach the employees about the new ERP system and provide reasons for its implementation. Ram et al., 2013 found training and education as critical success factors for organizational performance. FMC wished to have more resources available during the implementation phase. This could have affected their implementations alongside not having sufficient training. The implementation was successful in a way where they managed to run the production, but they were not problem free. Further, Maditinos et al., 2011 expresses that management support is essential for a successful implementation. The company experienced some leaders who did not prioritize introducing new processes, which could also contribute to challenges in the post-implementation phase as they were more concerned about the reporting aspect.

They encountered challenges in the implementation and post-implementation phases of adopting SAP. Resistance from employees against the new system created obstacles and hindered cooperation, particularly among experienced employees who had a deep-rooted attachment to established practices. Understanding the complex SAP system and the need for cross-functional consensus in decision-making posed further challenges. Inadequate preparation and overestimating progress led to an unsuccessful initial implementation, highlighting the importance of a well-prepared plan. The commitment of top management and the involvement of knowledgeable consultants played critical roles in the progress of the implementations. The need for sufficient training and education, support from corporate personnel, and effective knowledge transfer were emphasized as essential success factors. However, some leaders focused more on reporting aspects than introducing new processes, which could have contributed to challenges in the post-implementation phase. Overall, successful SAP implementation required management support, comprehensive preparation, training, and a focus on integrating new processes within the organization.

6.3 IT Infrastructure

The implementation of SAP has partly prompted FMC to adjust their IT infrastructure. The most significant change was the sale of their IT company to the consulting and business company that serves as their SAP application provider. Following the sale, the company established their internal Corporate IT, which consisted of a smaller group of people with specialized knowledge. FMC's new function in the IT structure was designated to be a premise setter, encompassing architectural knowledge, knowledge of supplier management, their strategic goal, business architecture in different areas, and project management.

The primary drivers for cloud migration were to increase agility, standardization, and futureproofing the IT systems of the whole organization. By transitioning to a cloud platform, it would be much easier to make changes in the future, as the technical debt was removed.

Further findings in our case align with Fox et al., 2009. The authors present how companies can implement complex IT systems without significant data infrastructure and maintenance investments, as a third party covers these aspects. As a result of the sale, the services in FMC are now provided by their SAP applicator. Their new IT structure corresponds with a PaaS infrastructure like Mell and Grance, 2011 has described. FMC is in control of the data and usage of the applications. At the same time, Microsoft maintains the applications and computational infrastructure and ensures that they work correctly alongside the database and updates.

All operational tasks and programming must be completed through a web browser in their public cloud Microsoft Azure. Their current practice uses the web browser, which displays the status and allows them to issue operational activities. With the help of Azure, they can utilize the resources needed. The new IT infrastructure will enable programmers to create small programs. The programs can, for instance, predict the weather, which affects their production strategies. The planning of these occurrences has always been there, but the difference is the possibility of predicting at an early stage. The decision to move the

operational aspect into Azure makes the process of swapping a component with a more cloud-friendly component more accessible. It enables the company to rebuild into a more cloud-based operation.

6.4 Management Accounting

Management accounting serves as a controller function in the company, generating reports to the CFO while being supported by a network of resources from the different departments within FMC. Their role is being a heavy support function in all corporate areas. As part of corporate management, they are responsible for different control areas and have played an essential key role when implementing the SAP system.

During the transition to SAP, the company encountered controllers preferring the old Axapta system. Their primary concerns were not directly related to new processes and organizational changes but rather the lack of complete understanding of the ongoing transition. As a consequence of new processes in practice, the role of management accounting became cemented rather than changed.

The controllers in the organization track the business as their primary task. They are accountable for making decisions regarding the accounting numbers and evaluating them. However, the accounting numbers are not directly used to make decisions but serve as a foundation to re-calculate the economic consequences. Reports are utilized alongside the re-calculated numbers to overview the corporate situation comprehensively. The information can indicate whether adjustments regarding the budget are needed. The function of management accounting in FMC aligns with the explanation of management accounting in theory (Atkinson et al., 1997; Bhimani et al., 2019, p. 3).

Furthermore, Caglio, 2003 and Scapens and Jazayeri, 2003 discovered in their study that adopting ERP caused changes in the role of management accounting. However, our case study reveals no significant changes in the role and competencies of management accounting after the implementation of SAP. This can be attributed to the fact that the responsibility of those in charge of management accounting is nearly unchanged. The company intended to modify or adjust several principles within the economy manager throughout the project, making it challenging for the participants to answer whether the change was a direct consequence of adopting SAP. The employees who worked with management accounting remained the same people as before the SAP system. They have acquired a new system and adapted to its operational requirements, but SAP has not caused a revolution. Their transition from their old ERP system to SAP caused fewer changes than companies compared to companies implementing ERP from a non-ERP system. However, management accounting has played an essential role during the implementation phase, corresponding with the case study by Caglio, 2003. It was revealed that management accountants held a hybrid function, including the operational and management aspects of the organization. This corresponds with our case study, where the empirical results demonstrated that management accounting functioned as heavy support in all corporate areas.

An additional impact of the SAP system is the improved integration between the shop

floor systems and the top management. The integration has facilitated closer collaboration between these two functions. Management accounting controls the information on animals and production, such as machine time on producing a product, packing time, and quantity of materials. This information establishes target parameters based on the factory level and is collected in the SAP system. The SAP system allows most of this information to be integrated.

The integrated system has influenced the relationship between management accounting and production management. It has integrated the two functions by establishing a rapid communication flow of reports between the shop floor system and the top management. SAP has given a higher degree of awareness related to timing.

An additional advantage of the integrated information is the enhanced established control systems related to tracking in the company. Control systems have ensured complete control of all processes, from when the animal is slaughtered to its distribution to the stores. The control system practiced in FMC makes it possible for the company to have total control of critical aspects such as which farm the animal came from and the control of each part of the animal throughout the production process.

SAP has enabled the company to enhance its control systems. Still, the most significant advantage the SAP system brings regarding management accounting is a better and higher degree of detail in cost monitoring. SAP has allowed the company to provide more accurate cost monitoring using several standard procedures. However, the challenge is linking management accounting information to practical operations. The company is pressured to deliver low prices to its customers. SAP has allowed the company to gather direct information from the production and the planned production cost for analysis.

As a consequence of SAP, it has become significantly difficult for individuals within the company to adjust the cost of a product unreasonably without considering production factors and the effort factors with the associated cost and quantity. SAP has connected the elements to the actual production. The information existed before SAP but was not united as one object.

The implementation of SAP has secured visibility in the organization and ensured better connection between the different data. Decisions regarding when, where, and how to optimize the whole operation have improved significantly due to SAP. The centralization of information, collection, and better connection of these objects have been crucial for the organization. FMC has gained an overview of managing the value chain and the business effectively. However, there are specific challenges regarding SAP. The system is relatively rigid, which can cause difficulties if employees do not perform their work correctly. If they fail to perform their work precisely, causing them to re-do their work, correcting the mistakes is slow and difficult. The process causes a chain reaction where subsequent managers involved in the same data are affected.

The awareness of the impacts that the rigid system holds throughout the whole company is crucial. Centralization of information possesses both its benefits and downfalls. The respective studies by Caglio, 2003 and Quattrone and Hopper, 2005 discovered a significant

improvement in accounting practice through visibility, standardization, and data quality. In our case, we did not observe significant improvement in accounting practice through these three aspects, but rather an enhancement control across functions throughout the company. SAP has facilitated the management to get a comprehensive overview of their value chain. The visibility provided by the integrated system has enabled the company to gain total control of all the necessary data for making operational decisions.

Despite managing to implement SAP in all of their factories, they find it challenging to get consensus among all the controllers in the company due to varied opinions. Incorporating a system as extensive as SAP while considering the views of all the controllers has proven to be quite challenging. The issue has not been solved yet, and will not be solved within the next years due to the necessary maturity. This aspect aligns with Heinzelmann, 2017 where he expresses that implementing an ERP system can take several years before the system reaches sufficient maturity to get decent results.

Both Heinzelmann, 2017 and Scapens and Jazayeri, 2003 demonstrated the challenge posed by SAP as a rigid system in their case studies. Different plants have different requirements and processes, which can cause misalignment of the business processes in using the ERP system the intended way. This misalignment can result in conflicts between managers and employees. In the case of FMC, this can be observed between the production managers and the management accounting. SAP has caused a need to change the way these two functions cooperate. Production managers can make decisions and control the production sites but then encounter the requirements and expectations from management accounting towards a good management accounting and control practice. The challenge during the transition concerned how the company could adopt SAP while managing to calculate the cost of the goods as correctly as possible.

Heinzelmann, 2017 and Caglio, 2003 illustrate challenges regarding standardization, such as accountants having less control over their work and accountants within FMC experienced their role becoming more cemented rather than changed. Challenges related to implementing SAP in Heinzelmann, 2017 differ from our case. The new requirements for master data have compelled the functions to be more precise in extracting reports and fostering cross-functional awareness. Integrating management accounting and the master data has caused increased consistency of high-quality and accurate reports. These findings correspond with Caglio, 2003. These two aspects are interconnected, as the establishment of a master data department would not have been as necessary without the new ERP system, thereby acting as a facilitator of change to enhance prevailing practice (Scapens & Jazayeri, 2003). However, a significant obstacle arises if the work is not performed precisely, and correcting the mistakes becomes slow and difficult.

The new requirements can be viewed as a form of control that secure data quality. In relation to management control, adopting new technology can facilitate control avoidance Merchant and Van der Stede, 2012, p. 13. FMC aligns with the example illustrated by Merchant and Van der Stede, 2012, pp. 13–14 of outsourcing a particular entity or activities to a third party. By outsourcing the operational tasks to Microsoft Azure, FMC has moved towards control avoidance.

Overall, the implementation of SAP did not significantly change the role of management accounting but rather solidified its position as a support function in all corporate areas. Controllers in the organization track the business and make decisions based on accounting numbers, using them as a foundation for evaluating the economic consequences. Integrating the SAP system improved collaboration between management accounting and production management, enabling a closer flow of communication and enhancing control systems related to tracking within the company. SAP has also provided better and more detailed cost monitoring, allowing for analysis based on production data. The implementation of SAP has improved visibility, standardization, and data quality, but the rigidity of the system and varied opinions among controllers pose ongoing challenges. The standardization and requirements of SAP have affected the cooperation between production managers and management accounting, requiring adjustments in their working relationship. The implementation of SAP has brought benefits and challenges, and the company continues to work towards consensus and aligning processes within the system.

Chapter 7

Conclusion

In our case study, we researched how the implementation of SAP affects an organization and its management accounting. We have gained extensive data material through interviews with FMC, allowing us to gather valuable insights. The data material has then been analyzed and compared to the relevant literature provided in this thesis.

The adoption of SAP has significantly impacted several vital areas, namely the initial failed implementation, the establishment of the master data department, and the integration across different departments. The failure of the first implementation can be attributed to poor preparations and project management. When adopting SAP, FMC estimated their progress inaccurately and lacked the necessary testing. Consequently, this initial failure partially affected the introduction of SAP in the organization.

Following the failed implementation, FMC realized the need to revise their implementation plan. They recognized the importance of taking a more measured and conscious approach rather than rushing the process, which demanded extensive competencies. This realization derived from the need to overcome resistance and ensure a successful implementation.

We also show how adopting SAP can cause stricter requirements for data quality and the extensive process of establishing uniform data usage. In our case, a dedicated master data department was established to meet these requirements. The introduction of SAP necessitated higher accuracy and consistency in data management. By establishing a specialized department, the organization focused on ensuring its data quality, integrity, and consistency, leading to improved data management practices.

The establishment of the master data department has caused a required consensus among all employees regarding how they utilize the same data to make changes. As a result, the output consists of precise reports of higher quality. The increased precision and data flows have shifted FMC's operations to more accurately balance their product output with the demand in the market rather than only emphasizing high-volume production. This shift has enabled the company to generate a more accurate blend of products being produced, leading to increased profitability. Moreover, the implementation of SAP affected the organization by enforcing a sequential workflow, where one department cannot proceed until the previous department has completed their work correctly. While this practice improves accuracy, it

can potentially result in a chain reaction causing subsequent functions massive delays, and where correcting these delays can be slow and difficult.

Additionally, integrating the departments and subsidiaries brought on by SAP is a significant benefit for the organization, enabling rapid communication flow of reports between the top management and the shop floor systems. FMC has acknowledged the dependencies between different departments, where activities performed on the production line directly impact economic management. However, the company has not fully integrated all aspects, requiring further development and maturity.

In summary, adopting SAP has both been a driver and a result of a change process for FMC. It has allowed them to have a future-focused perspective instead of being hindered by an outdated system. Companies planning to implement SAP should know the extensive preparations required beforehand, and they can secure adequate training and support in the post-implementation phase, which has been proven crucial. If FMC had more resources available, it would have enhanced FMC's utilization of their resources and suppliers. However, it is essential to emphasize that FMC's experience is specific to their large organization with a complex structure, and not all companies may face the same circumstances.

Appendix A

Interview Guide

Question	Category
Can you tell us a bit about the SAP project?	SAP
What were the main drivers/rationales behind adopting SAP?	SAP
Which modules and tools are included in the SAP-system, and which provider is being used?	SAP
What IT-systems were previously used?	SAP
How were they different?	SAP
How did the implementation of SAP affect the organization?	SAP
What are your thoughts on SAP, was the implementation a success?	SAP
What were the main challenges after implementing the SAP-system?	SAP
Has the SAP-system changed the way roles function in the organization?	SAP
How has the SAP-system affected the cooperation across different departments and functions within the organization?	SAP
What are the main responsibilities of the IT department, and have they changed since the implementation of SAP?	SAP
If so, how? How does the IT department interact with the MA?	SAP
Have there been challenges related to the customization of the SAP-system?	SAP
How was the learning process post-implementation?	SAP
Was it required to readjust and relearn processes within business functions because of the processes ingrained in the SAP system?	SAP

How was the motivation for learning the new processes for managers and employees?	SAP
How would you assess the implementation process?	SAP
Should more time and resources have been allocated for a better integrated system?	SAP
Have some critical components to the system been left out?	SAP
Was there any resistance against the new system? Why?	SAP
Do you consider the implementation of SAP as an efficient process, or did you have some delays? Why?	SAP
What are the measures that have been done from the upper management to support the post-implementation?	SAP
How is management accounting right now?	Management Accounting
What are the main systems, practices, and IT systems?	Management Accounting
How well are the systems integrated?	Management Accounting
What role does management accounting have in the organization?	Management Accounting
What were the control systems before and after SAP implementation?	Management Accounting
How does the SAP system affect the relationship between management accountants and other departments/roles in the organization?	Management Accounting
How has the SAP-system affected the accounting practices and processes?	Management Accounting
Has the potential centralization of information brought on by the SAP-system affected management accounting processes?	Management Accounting
How has the SAP-system affected the role and the required competencies of management accountants?	Management Accounting
Are there separate systems and tools that are being used by management accountants?	Management Accounting
How do these systems interact with the ERP-system?	Management Accounting
What are the benefits of the new systems/process?	Management Accounting
What are the challenges related to the new systems/processes?	Management Accounting
How are the current decision-making processes in the company,	Decision Making
and which functions and people are included within these processes?	Decision Making
What is the link between MA and the new SAP?	Decision Making

How has the centralization of information affected the decision-making and control processes in the organization? Has the SAP-system helped managers get better visibility over the organization and departments to make faster/better decisions?	Decision Making
Has the implementation of the SAP-system affected the organizational structure in practice?	Decision Making
Which factors are considered when making strategic decisions? Has the system affected strategic priorities when making decisions?	Decision Making

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