Information systems business value: An ERP implementation viewpoint

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ABSTRACT

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Successful information system implementation can contribute to an organization's competitive advantage. In today's highly competitive and rapidly changing environment, organizations must be able to leverage the potential benefits that information system changes offer.

This master's thesis aimed to determine the benefits that industrial organizations can achieve from an information system change, specifically an enterprise resource planning system change. For that, it was necessary to understand the factors that enable the successful implementation of a new enterprise resource planning system. Recognizing the potential benefits of the change and its enablers for success could be seen as key actions that industrial organizations must take to maximize the business value of their enterprise resource planning system. The thesis includes an analysis of the case organization's information system readiness, the possible benefits recognized, and suggested actions to improve information system readiness.

The study was conducted using qualitative research methods. Six industrial organizations that had undergone a change to their enterprise resource planning system were interviewed, and the data were analyzed using theory-driven content analysis.

Research results indicate that industrial organizations need to improve readiness for changes to the enterprise resource planning system. Particularly in employee and management commitment and attitude, as well as providing resources and chances to participate in change at every organizational level. Benefits from the enterprise resource planning system changes can be achieved in areas such as reporting, customer service, individual skills, profitability, and partnerships. Case organization, however, must enhance its information system readiness to fully reap the identified benefits of an enterprise resource planning system change.

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Tietojärjestelmien onnistunut käyttöönotto voi edistää organisaatioiden kilpailuetua. Nykyisessä erittäin kilpaillussa ja nopeasti muuttuvassa ympäristössä organisaatioiden on kyettävä hyödyntämään tietojärjestelmämuutosten tarjoamat mahdolliset edut.

Tämän pro gradu -tutkielman tavoitteena oli selvittää, mitä hyötyjä teollisuusorganisaatiot voivat saavuttaa tietojärjestelmämuutoksella, tarkemmin toiminnanohjausjärjestelmän muutoksella. Tätä varten oli tarpeen ymmärtää tekijät, jotka mahdollistavat uuden järjestelmän onnistuneen käyttöönoton. Tietämällä muutoksen mahdolliset hyödyt ja onnistumisen mahdollistajat voidaan tunnistaa toimenpiteet, jotka teollisuusorganisaatioiden on toteutettava maksimoidakseen toiminnanohjausjärjestelmän liiketoiminta-arvon. Viimeisessä vaiheessa analysoitiin tapausorganisaation tietojärjestelmävalmius ja mahdolliset hyödyt sekä tehtiin ehdotuksia tietojärjestelmävalmiuden parantamiseksi.

Tutkimus toteutettiin kvalitatiivisin tutkimusmenetelmin. Haastateltiin kuutta teollisuusorganisaatiota, jotka olivat käyneet läpi toiminnanohjausjärjestelmän muutoksen, ja aineisto analysoitiin teoriaohjaavan sisällönanalyysin avulla.

Tutkimustulokset paljastavat, että teollisuusorganisaatioissa tarvitaan parannusta erityisesti työntekijöiden ja johdon sitoutumisessa ja asenteessa sekä resurssien tarjoamisessa ja mahdollisuuksissa osallistua muutokseen kaikilla organisaation tasoilla. Toiminnanohjausjärjestelmän muutoksista saatavia hyötyjä voidaan saavuttaa raportoinnissa, asiakaspalvelussa, yksilöllisissä taidoissa, kannattavuudessa ja kumppanuuksissa. Tapausorganisaation analyysi paljasti, että organisaatio voi saavuttaa useita hyötyjä, mutta sen on parannettava tietojärjestelmävalmiuttaan saadakseen toiminnanohjausjärjestelmän muutoksesta parhaat edut.

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1 Introduction

Information systems (IS) and their effective use are more crucial than ever in creating business value in a competitive market. The role of information systems in creating business value is central, as it impacts organizational performance at various levels. This perspective places information systems at the core of an organization's operations, strategic planning, and gaining of sustainable competitiveness. (Gellweiler, Krishnamurthi 2022; Schryen 2013) It is essential to understand how information systems can enhance organizational performance and contribute to achieving and maintaining a sustainable competitive advantage. In this master's thesis, the factors that enable the successful usage and change of information systems will be identified, as well as the potential benefits information system changes can bring to the case organization. The potential benefits of information systems must be identified so that they can be utilized (Zammuto, Terri, Griffith, Majchrzak, Dougherty, Faraj 2007). This study is conducted through the lens of industrial companies and their enterprise resource planning (ERP) systems, examining the potential benefits of ERP system change. It's essential to identify industry-specific factors that impact the success of information systems and their potential benefits, as these factors and benefits vary by industry. (Jöhnk, Weibert, Wyrtki 2020) These findings are used to analyze the current state of the case organization where an industrial organization is implementing an ERP change.

IS readiness is conceptualized with psychological factors, such as the commitment to change, as structural constituents, such as the capability to change, and contextual factors (Lokuge et al. 2018; Weiner 2009) that are subjective factors that are hard to measure. In previous literature, several factors have been identified as affecting an organization's information system readiness and value. Resource readiness, IT readiness, cognitive readiness, partnership readiness, innovation valance, cultural readiness, and strategic readiness are all affecting IS readiness and IS business value (Snyder-Halpern 2001; Weiner 2009) Still IS business value is evaluated by financial values, and non-monetary benefits are easily overlooked in research (Gellweiler et al. 2022). IS business value is complex to evaluate as there are direct and indirect benefits for organizations. In previous studies, value has been primarily evaluated through financial terms; however, it is also important to

recognize the indirect, non-monetary benefits. Impacts can be challenging to realize as they manifest at various levels and times under different environmental influences (Gellweiler, Krishnamurthi 2022; Schryen 2013) Besides indirect benefits, context-specific consideration is needed, and studies should be tailored to the related domain, i.e. a specific technology when IS readiness and value are studied (Molla, Licker 2005). Research in particular business areas and specific information systems brings the opportunity for a deeper understanding of what kind of benefits can be reached with information systems in particular business environments.

The research was done in qualitative methods. Six industrial organizations were interviewed about their journey to conducting an enterprice resource planning system change. In these semi-structured interviews, organizations were evaluating their readiness for the ERP change and the benefits gained from it. Industrial organizations' readiness for information system changes is not in a strong base, and they have to take actions to increase employee commitment, decrease resistance to change, and provide enough resources to gain the best business value from ERP system change. ERP systems bring benefits to the organizational, customer, and financial stages. Better visibility of the production and material flow enhanced production planning and customer service, and real-time accurate data ensured better decision-making and improved individual skills, strengthening the organization's knowledge and processes. To achieve these benefits and maximize information system business value from ERP system changes, industrial organizations must focus on employees and commit them to the change positively. Commitment and support from the managers and top management are needed to ensure enough resources for successful ERP implementation.

1.1 Research objectives and questions

Industrial organizations need to succeed in the information system changes to gain business value and competitive advantage. Well-managed information system change can lead to various benefits. The case organization is an industrial company that manufactures valves and pumps for the mining and metals industry. The case organization's revenue is approximately 30 million euros, and it employs around 100 staff members. ERP implementation is planned for 2025. The organization has become a part of a larger group

through acquisitions. Often, acquisitions lead to ERP changes, and this is also the case in this instance. The acquired organization will adopt the acquirer's ERP system. The importance of this study for the case organization lies in the need to succeed in integration and gain business value. The failure of information system integration has been identified as the third most crucial reason for unsuccessful organization integration. On the other hand, if information system integration capabilities are well managed, they can lead to various benefits. Previous studies have shown that approximately 45% of the overall benefits of acquisition depend directly on the effective integration of information systems. (Hedman, Sarker 2015) By determining the benefits that industrial organizations can achieve from an information system change, and specifically an ERP system change, there are better opportunities to achieve them. For that, it is necessary to understand the factors that enable the successful implementation of a new ERP system.

To find out how an organization can succeed in the face of change and gain business value from it, there are three main research questions and two supporting questions. Main research question is:

Q1: How does an organization’s information system readiness affect information system business value?

To achieve the business value of information systems, one must first recognize its potential. An understanding of the relationship between information system readiness and business value enables organizations to plan effective strategies for implementing and utilizing information systems in a manner that generates business value for the organization. By understanding how information system readiness affects the business value, it can be found how an organization's business value can be enhanced through it. Achieving the business value of information system changes can be a key factor in gaining a competitive advantage in the business.

The other two questions are to help find answers to the main research question:

Q2: What does an organization need for the successful adoption and use of information systems?

The success of an information system depends not only on its implementation but also on how well it is adapted and used by the organization. It’s essential to understand the factors necessary for successful adoption, as the failure of IS adoption has been identified as the

third most significant reason for unsuccessful organizational change. On the other hand, if information system adoption capabilities are well managed, they can lead to various benefits. (Hedman, Sarker 2015). This question helps to explore the requirements for the successful adoption of the system. By identifying the requirements and factors for successful adoption and usage of IS, organizations can develop strategies to enhance those factors affecting the implementation and utilization of IS.

Q3: How does the successful adoption and use of information systems influence information system business value?

Successful adaptation and use of IS are key to getting business value from it. Understanding this relationship helps to explain how proper adaptation and usage directly contribute to business value. This question aims to find out the practical outcomes of IS adoption, and by finding those practical actions influencing IS changes, business values organizations can adjust their strategy to achieve the best results in business value.

1.2 Research key concepts

Information system (IS)

An information system (IS) is a socio-technical system in which technology and people interact with each other (Alter, 2008) to serve an organizational purpose (Lyytinen, Newman 2006). Information systems include infrastructure, organization, personnel, and technology for the collecting, processing, storage, transmission, and display of information (Schryen 2023; Lyytinen, Newman 2006)

Information system readiness

Readiness to adapt innovations and new information systems. IS readiness has been typically conceptualized in terms of psychological factors, such as an individual's attitude toward change or an organization's capabilities to succeed in the change. (Weiner 2009; Rafferty et al. 2013; Lokuge et al. 2018)

Information system business value

Information system business value is defined as follows: “IT (business) value results from IT investments that provide benefits to customers and to the organization (i.e., firm).”

(Gellweiler et al. 2022) The information system business value is the impact of IS investment on the performance and capabilities of economic entities at various levels (Schryen 2013).

1.3 Research methodology

This study has been done by a qualitative research method to gain a deeper understanding of the factors affecting information systems and the potential benefits they bring to organizations. The qualitative research method aims to understand phenomena in depth and comprehensively by gathering specific information about them rather than relying on numeric measurements. (Puusa, Juuti, Aaltio 2020) Qualitative research can be used when studying abstract themes, where collected data can be subjective and descriptive, and there is an understanding that different factors are continually shaping situations around the theme. (Hirsjärvi, Remes, Sajavaara 2009, 161). Alasuutari (2011) describes qualitative research data to express a broader perspective, which is needed when studying complex phenomena.

Readiness to information systems and their perceived benefits are complex phenomena where various factors affect the results and experiences of information systems. According to Molla and Licker (2005), information system readiness is the feeling and experience of the organization's members. This encourages the choice of the qualitative approach as it emphasizes the subjectivity and knowledge gathered from it (Puusa et al. 2020). This context-specific consideration of ERP change benefits to industrial organizations is needed to understand case organizations' readiness for ERP change and its potential benefits.

1.4 Limitations

The study's limitations should be considered in light of the complex nature of information system business value. It is challenging to verify the direct and indirect effects of the factors that affect information system business value, as the impacts may be interdependent or result from multiple factors combined.

The second limitation relates to industry differentiation. Different industries may have varying levels of information system readiness, which affects the potential for information system business value creation. This study focuses on the industrial sector, and the

interviewees for the empirical research were selected accordingly. If a study is conducted in another industry, the results may differ. Additionally, as is well known, the environment, particularly in IT-related topics, is constantly changing and evolving. Therefore, the findings of this study may become outdated sooner than we realize.

1.5 Structure of the study

The second and third chapters include a literature review. Chapter two investigates information system business value and, through a literature review, identifies when information systems bring value to the organization and what potential benefits can be achieved from IS.

The third chapter delves into the theme of information systems readiness. The aim is to establish the foundation for information system readiness by examining change readiness, gaining insight into the IT/IS perspective, and developing a framework for information system readiness. Following the literature review, a framework for IS business value and the benefits it may bring will be presented. At the end of the third chapter, a ready theoretical frame for the empirical part of the study will be presented.

Chapter four presents the basis for the empirical study. This section covers the basics of qualitative research, as well as the chosen research method and methodology. Chapter five continues by presenting the analysis's results and comparing them to the previously established theoretical framework. The results are used to analyze case organization and determine the benefits it could gain from the new ERP system.

Chapter six discusses the study's results and compares them to previous research to confirm conclusions from the empirical study. Chapter seven presents the final conclusions, synthesizing the thesis results and outlining the practical implications and limitations of the study.

2 Information system business value

To understand how ERP systems can bring value to the organization, there needs to be an understanding of information systems (IS) business value. Gellweiler and Krishnamurthi (2022) suggest after their analysis that information system business value could be defined as follows: “IT (business) value results from IT investments that provide benefits to customers and the organization (i.e., firm).” Organizations must be ready to reallocate their resources (Schryen 2013) and change their strategies continuously to keep a competitive advantage through digital technologies, as IT innovations are easily replicable. (Lokuge et al. 2018) To get business value or benefits from an information system, it must be formed through intangible assets (Meso et al. 2000). In this chapter, we examine how IS business value is constructed through a literature review and forms an IT-value model.

2.1 IS value creation

In a comprehensive understanding of information systems, information systems are seen as the entire infrastructure of the organization. The organization, personnel, components, data collection, processing, storage, transfer, presentation, and dissemination and sharing of the information are all part of information systems. (Schryen 2013) This leads to that the business value of information systems is the impact of information system investments on the performance and capabilities of economic actors at different levels and by the actual significance of performance in the economic environment. (Schryen 2013; Cao, Wiengarten, Humphreys 2011; Kohli, Grover 2008) The business value of information systems can be seen to be reached from various economic (both tangible and intangible) benefits at the individual, company, industry, and macroeconomic levels (Kohli et al. 2008). Organizations' internal resources, technological and organizational adaptability, environmental demands, and stakeholder involvement all influence IS value creation.

The resource-based view (RBV) focuses on the organization’s internal factors, resources, and capabilities (Wernerfelt 1984) to find out why some organizations perform better when they are focusing on the valuable internal resources of the firm. The goal of the resource-based view is to create value through a sustainable competitive advantage. RBV’s

perspective on IS value creation is that information systems are not alone in bringing a competitive advantage; it's also about organizations' IT management and general management processes (Mata, Fuerst, Barney 1995). The supporters of this view argue that organizations should look within the company to find the sources of competitive advantage rather than examining the competitive environment. Resources are, in this manner, all tangible and intangible aspects that can be strengths or weaknesses for the company. Resources can include brand, in-house experience and knowledge of technology, employees' skills, customer relationships, and machinery available (Wernerfelt, 1984), as well as immaterial and material resources purchased for IT actions (Bharadwaj, 2000). Barney (1991) highlights four criteria for resources that can bring value to organizations: valuable, rare, imperfectly imitable, and non-substitutable. That information system can create value, these resources must be efficiently integrated and utilized within the organization (Uwizeyemungu, Raymond 2012). Valuable means that recourse has the capability to be an opportunity to exploit a market or at least decrease possible threats in the market; rare resources are unique among current and potential competitors, and competitors don't have access to these resources. Resources that are hard or impossible to imitate or create substitutes bring long-term value to the organizations. (Barney 1991) The resource-based view provides a foundation for understanding that information systems can bring a competitive advantage through the utilization of resources (Melville, Kraemer, Gurbaxani 2004).

The technology-organization-environment (TOE) framework was developed to explain how the adoption of new technology is influenced by various factors. Technology indicates the available technologies and their characteristics, the organization refers to its organizational characteristics, and the environment explores the arena in which the organization conducts its business. (Arpaci, Yardimci, Ozkan, Turetken 2012) From a technological view, an organization should have technological skills and capabilities and the ability to understand systems (Schryen 2013; Mirchandani, Motwani 2001) and enough financial resources for systems supplies such as computers, software, and internal support for employees to get the value from information systems (Kuan, Chau 2001). Organizational characteristics commonly include the size of the organization, degree of centralization and formalization, managerial structure, quality of human resources, and number of internal free resources (Arpaci et al. 2012). A positive attitude toward information systems from management will increase the capability to create business value (Schryen 2013; Mirchandani et al. 2001), as

it enhances the likelihood of having sufficient financial, technological, and human resources for implementation. The environment includes the industry, competitors, regulations, and relationships with stakeholders (Arpaci et al. 2012). Organizations need to respond to the demands set by the external environment. When implementing new information systems, involving stakeholders such as information system vendors (Kuan et al. 2001) can create business value by addressing these demands in a targeted manner.

An information system alone does not create value; it requires actors around it (Kohli et al. 2008). Schryen (2013) synthesized the information system business value model (Figure 1), where business performance and value are formed through information system investments that are influenced by resources and capabilities, as well as the internal and external environments in which the organization operates. The information system business value model also takes into account the possibility of other non-IS investments that may affect performance, as well as the challenge of evaluating the timeline when the benefits of the information system investment can be actually achieved and recognized.

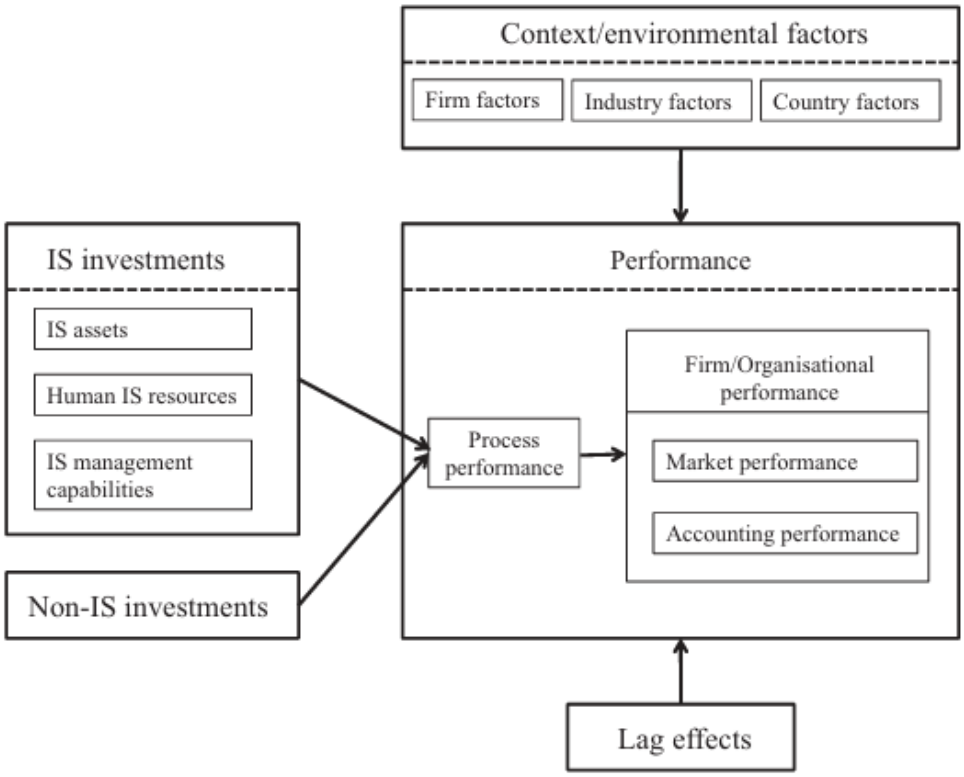

Figure 1. Synthesized IS business value model. (Schryen 2013)

It should be noted that it is not possible to determine whether information systems are generating significant business value, as measurable performance is often highly context-dependent (Mitra, Sambamurthy, Westerman 2011). Although performance and value are strongly connected, this does not mean that in every situation, value automatically leads to increased performance or vice versa. Therefore, evaluating the relationship between value and performance is a challenging task.

2.2 IT value model

The IT-value model is a result of Gellweilers and Krishnamurthis's (2022) study, where they expanded the understanding of IT value by adding a customer-based view (CBV) to previous findings about the resource-based view (RBV). Meso et al. (2000) used RBV when studying the value of IS to the organization. From a technical perspective, information systems are not valuable strategic assets because information system technology lacks the characteristics of being rare, imperfectly imitable, valuable, and non-substitutable, as defined for strategic assets. Anyone can acquire the same technology, imitate it, or find a substitute. Tangible assets in IS are not considered strategically valuable. (Meso et al. 2000; Oh, Pinsonneault 2007) The socio-technical perspective suggests that when technology is surrounded by a complex environment of organizational infrastructure, corporate culture, knowledge, and people, the information system will turn out to be a strategic asset. (Meso et al 2000) Intangible features are hard to copy, and they always create a specific environment at that very moment.

According to Gellweiler and Krishnamurthi (2022), the customer-based view complements the resource-based view. As RBV considers the internal aspects of an organization, CBV focuses more on the external view. IT-value model (Figure 2) includes organizational value, customer value, and firm performance. Customer value needs RBV's organizational value as its grounding, but in the end, customer value is the place where the firm performance comes to organizations. (Gellweiler, Krishnamurthi 2022).

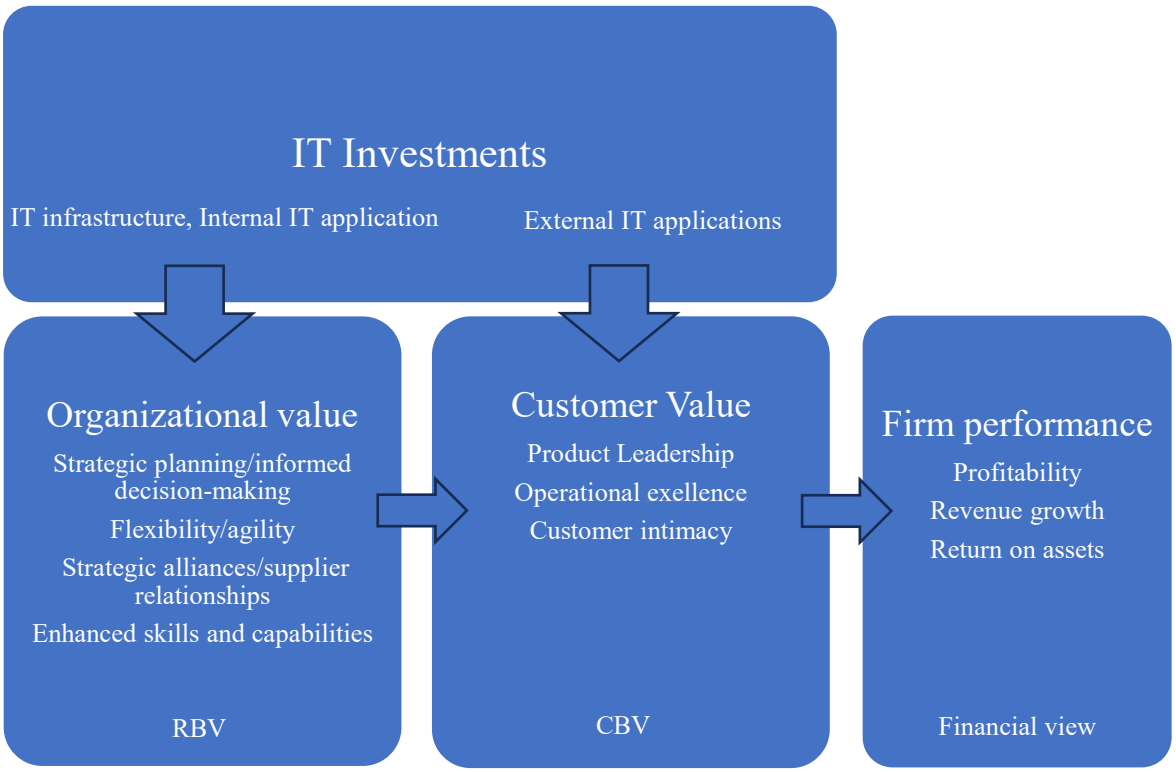

Figure 2. IT value model adapted Gellweiler Krishnamurthi (2022)

Schryen (2013) confirmed that investing in information systems offers opportunities to enhance processes and performance. IS business value can be seen through better process performances (Melville et al. 2004), which leads to better business performance. Gelleweiler and Krishnamurthi (2022) confirm in their study that IS can increase efficiency and productivity. Once information systems are well-planned and creating business value, they can lead to a sustainable competitive advantage. Besides providing a competitive advantage, information systems can also help organizations manage risk by identifying and mitigating potential threats.

2.3 IT investment value impact

IT investment change can add information system business value at various levels. By examining organizational value, customer value, and firm performance, we can gain insight into how IT investments contribute to overall business value. The following subsections

will discuss the potential added values that organizations may achieve through IT investments.

2.3.1 Organizational value

Organizational value is needed, although it does not generate direct revenues for the organization. IT infrastructure has been recognized as an organizational capability that creates value. IT infrastructures are shared resources that form the base for IT systems. Synergies can be generated by sharing these resources across an organization, which brings financial advantages and can be regarded as organizational value. It has been found that good IT capabilities significantly impact an organization's performance.

Strategic planning and informed decision-making ensure that data, process flow, and decision-making support the organization's business strategy, leading to improved performance. (Gellweiler, Krishnamurthi 2022) IT managers should understand how technologies can be utilized and how to motivate and manage information system change (Wade, Hulland, 2004) to enable informed decisions. Delays in decision-making may also lead to delays in profitability if important business development actions, such as growth opportunities or IT business alignment, remain unused. (Gellweiler, Krishnamurthi 2022)

Flexibility and agility refer to the ability to quickly adapt resources and capabilities in response to changes in the product or service offering, such as environmental shifts (flexibility) and/or shifts in competitive position (agility). (Gellweiler, Krishnamurthi 2022) Flexible IT infrastructures support innovations that consider the whole organization, and by introducing new products and innovations, it may be possible to reach financial efficiencies. (Wade et al. 2004) In addition, flexible structures within and between organizations (e.g., suppliers, human resources) can potentially accelerate product or service delivery, allocate resources more effectively, and improve firm performance. (Gellweiler, Krishnamurthi 2022). Felipe, Leidner, Roldan, and Leal-Rodriguez (2020) argue in their study that flexibility and agility are wrongly used as synonyms. Agility should be seen as the next level of flexibility. Agility enables organizations to identify the need for change, both internally and externally, and implement the necessary changes within organizations. Organizational environments are complex, dynamic, and turbulent these days, and agility answers a need to

reconfigure resources quickly in a way that enables them to create sustainable value. (Felipe et al.2020)

Strategic alliances and supplier relationships are part of organizational value. Business linkages to other firms that are part of the value chain should be managed efficiently (Melville et al. 2004; Wade et al.2004). These relationships may help to develop a stable infrastructure and system for the organization or create better services for customers (Wade et al. 2004)

Enhanced skills and capabilities can create value. Increased skills among human resources mean that employees are able to utilize and manage all the knowledge they have (Wade et al. 2004), and to achieve that state, employees need to be encouraged to learn. Melville et al. (2004) agree that IT management skills may bring a competitive advantage.

2.3.2 Customer value

Gellweiler and Krishnamurthi (2022) added a customer-based view into the IT value model as they thought that information systems could improve customer experience, which would increase IS business value. Customer value generates direct income for the organization and has a direct impact on its performance. Customer value can be achieved by providing more value to customers through IT systems, or IT can be used to enhance operational effectiveness, which pursues value for customers. (Gellweiler, Krishnamurthi 2022)

Customer value can be added in three different ways. Product leadership is described as a state where an organization delivers new products with new outstanding features or innovations. The operational excellence goal is to provide cost advantages through process efficiency or economies of scale. Customer intimacy refers to customer relationships in which the organization's primary goal is to solve complex problems for customers and deliver the highest level of service. (Gellweiler, Krishnamurthi 2022) There is a suggestion from a different point of view on how customers could bring value. By involving the customer in an information system investment that considers the customer, the customer could create more value for the IS and the organization. (Smedberg 2015)

2.3.3 Firm performance

Firm performance can be measured by financial terms such as profitability and return on sales (Gellweiler et al. 2022), or stock market value, as suggested by Schryen (2013). There is no clear evidence that some measurements would be better than others so there are many ways to evaluate the economic outcomes of IT investments (Schryen 2013) Even though it's commonly accepted that IS business value is built to its effects on an organization's performance (Cao et al. 2011) it must keep in a mind, that the topic is attached to its context tightly and it's challenging to evaluate what actual factors are effecting to organizations performance (Mitra, Sambamurthy, Westerman 2011). Firm performance or information system business value can't be measured solely by tangible economic indicators (Mitra et al. 2011; Gellweiler et al. 2022), as various non-monetary factors also affect business value. For example, enhancing processes, supplier relationships, and knowledge are non-monetary factors that indirectly reflect performance. (Gellweiler et al. 2022)

Indirect benefits to business value are not the only challenges when evaluating IS business value in terms of an organization's performance. At the same time, the environment, industry, and operating country can all impact the performance of an information system within an organization. Additionally, other investments can impact the business value of information system investments; for example, training personnel can lead to higher efficiency, which is unrelated to information system investment. The last challenge in evaluating IS business value is time; potential effects can become visible after years. (Schryen 2013).

3 Information System readiness

Information systems readiness has been discussed in various contexts, including the adoption of technologies and AI, e-readiness, and digital readiness. (Snyder-Halpern 2001; Molla et al. 2005; Jöhnk et al. 2013; Nguen et al. 2019) IS readiness refers to an organization's ability to adopt innovations and new IT technologies, and high readiness reduces the risk of failure and enables more successful outcomes. (Subramanian, Nilakanta 1996; Snyder-Halpern 2001) In this chapter, the aim is to examine, based on the literature, how information system readiness is constituted from organizational readiness theories and discuss factors that are affecting information system readiness.

Discussions have one common spot: readiness for change. Theories of change readiness form the foundation and basics for understanding IS readiness, as they examine organizations' readiness to implement and sustain changes, which is crucial when adopting new information systems. Understanding the basic needs for successful change is crucial for information system readiness, as organizational readiness has been found to be a factor in the successful implementation of information systems, particularly in the context of enterprise resource planning systems, according to studies. (Zhu et al. 2010)

Literature has identified several factors that affect readiness for adapting to new technologies. Lokuge et al. (2019) and Jöhnk et al. (2013) formed different groups in their studies related to technology and innovation readiness levels in organizations. The theory of organizational readiness for change provides the overarching theoretical base for organizational readiness (Lokuge et al. 2018).

3.1 Change readiness

Organizational readiness is defined by Weiner (2009) as follows:" -- readiness for change refers to organizational members' change commitment and self-efficacy to implement organizational change". Hustus and Owens (2018) also describe readiness for change as a cognitive or psychological construct that forms: "the beliefs, attitudes, and intentions of those who are involved in a change process." Change readiness is considered multiple levels: individual, work group and organizational readiness (Lokuge, Sedera, Grover, Xu 2018).

Individual readiness refers to an individual's belief in the need for change, an individual's capacity to succeed in change, and the belief that change has positive outcomes for the individual. In addition, individual readiness includes his or her current and future-orientated attitudes toward change (Rafferty, Jimmieson, Armenakis 2013). Workgroup readiness is defined as the collective attitude of a work group toward change. A workgroup needs a shared feeling of the need for change, a shared belief that success in change is possible and positive. (Rafferty et al. 2013)

Rafferty et al. (2013) highlight human capital's importance in change readiness. Communication is also important at the individual level as high-quality communication and leadership will improve change readiness. Successful communication will increase acceptance of change, openness, and commitment to it, and leaders have an influence on their employees. Leaders can change the attitudes of employees through their support. (Rafferty et al. 2013) Previous experiences of changes are affecting individuals; if individuals have been facing changes before, they might have better resilience to changes because of their experience. (Self, Armenakis, Schraeder 2007) Assuming that experiences have been positive, individuals have had enough support from the organization, and they have felt sharing a common value between change agents and change recipients and the organization. (Rafferty et al. 2013) Researchers have also identified that the content of change (Self et al. 2007) and scale are affecting individuals' readiness for change. Large changes cause more negative feelings than small step-by-step changes.

Studies have shown that to achieve high workgroup readiness for a change, it's necessary that there is a clear vision of what change means for the group and that it has been communicated well. (Whelan-Barry, Gordon, Hinings 2003) Communication fosters a shared understanding of what change means to the group and its overall functionality. Another necessity for high-level group readiness is a clear plan for the group on how the change will be implemented. These factors enable groups' capability to deal with the changes. Besides good communication and an implementation plan, it's argued that a leader must have the ability to handle emotions that change is bringing up and recognize from the individuals if there are emotional patterns that affect the whole workgroup (Sanchez-Burks, Huy 2009). By creating a psychologically safe work group where individuals feel comfortable being themselves, group readiness for change may increase. However, it has

also been argued that the emotional climate depends on the balance of positive and negative individual characteristics within the workgroup. (George 1990)

Studies have identified strategic and structural characteristics in companies that enable organizational change readiness. Organizations that are ready for change have a strong focus on the future and are committed to evaluating potential future scenarios when making decisions (Worley, Lawler, 2009). Empirical studies have confirmed that the more open-minded leaders are, the more open the culture and attitudes within organizations (Musteen, Barker, Baeter 2006). Organizational culture is identified as a factor that affects organizational change readiness. Flexibility-orientated values in the organization are leading toward successful change. It has been identified that organizational-level emotions can affect change readiness. Organizations that have a positive attitude towards change tend to identify the emotions that arise from change and take action based on these recognized feelings. (Rafferty et al. 2013) Table 1 summarizes the factors that affect different levels of organizational change readiness.

Table 1. Change readiness factors adapted Rafferty (2013)

Level of change readiness	**Factors affecting readiness for change**	
Individual	• Participation in change • Communication • Leadership • Previous experiences of change	• Values • Content of change • Individuals characteristics • Organizational support
Work group	• Communication • Implementation plan for change • Characteristics of group members	• Recognizing how change affects group • Psychological safety • Ability to handle emotions
Organizational	• Future orientation • Organizational learning • Attitude towards change	• Leaders • Organizational culture • Values

Higher readiness for change leads to better results during organizational changes and decreases the risk of failure (Snyder-Halpern, 2001; Weiner, 2009). Readiness has been typically conceptualized in terms of psychological factors, such as an individual's attitude toward change or an organization's capabilities to succeed in the change. (Weiner 2009; Rafferty et al. 2013; Lokuge et al. 2018) The information system discussion suggests various factors influencing organizational readiness for technology adoption. For example, financial and technological resources, management support, organizational culture, commitment, communication of goals, and partnership readiness (Weiner 2009; Jöhnk et al. 2013; Lokuge et al. 2018) Thus, it's argued that information system readiness should be studied more context specifically and should be tailored to concern i.e. specific information system. (Molla, Licker 2005).

3.2 Organizational readiness for digital innovations

Lokuge et al. (2019) developed an a priori model of organizational readiness for digital innovations, which includes seven factors that affect organizations' digital innovations: resource readiness, IT readiness, cognitive readiness, partnership readiness, innovation valance, cultural readiness, and strategic readiness (Figure 3). Information systems scholars have identified that readiness for digital innovations and changes are directly attached to results and risks (Snyder-Halpern 2001; Weiner 2009) in implementing new information systems. In this sense, these factors can be seen as grounds for achieving the success of information systems with benefits.

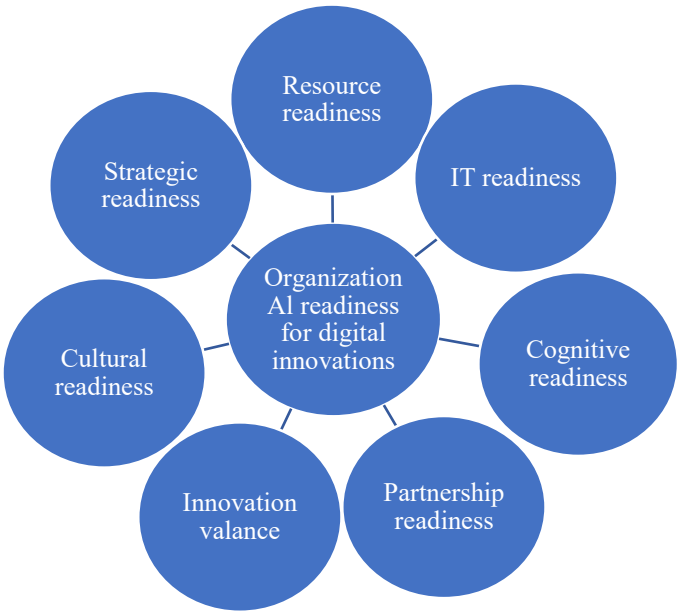

Figure 3. Factors affecting organization AI readiness adapted Lokuge et al. (2018)

3.2.1 Resource readiness

Resource readiness refers to an organization's ability to support digital innovations and change. In this context, resources are financial, human capital, and technological infrastructure. These resources should be allocated carefully so that the information system can be utilized effectively. (Jöhnk et al. 2013; Lokuge 2018) Nguyen et al. (2019) have recognized organizational assets and capabilities as a part of resource readiness. To achieve the successful implementation of information systems and gain information system readiness, it is crucial to support the resources operating around them, in addition to having the financial capability to invest in new information systems. (Lokuge 2018)

3.2.2 IT Readiness

IT readiness underscores the significance of enterprise systems and their pivotal role in driving digital innovations. Lokuge et al. (2018) argue that an enterprise system is necessary for core business processes, such as accounting and human resource management, and their findings highlight that utilizing digital technologies requires a stable enterprise system.

Another important point that Lokuge et al. (2018) found was that it is important to have accessible digital technologies. Additionally, it is essential to note that stability in enterprise systems requires data that must be easily accessible, of high quality, and straightforward to process. (Jöhnk et al. 2013)

3.2.3 Cognitive readiness

Cognitive readiness refers to an organization's knowledge of digital innovation. The knowledge, skills, and adaptability of employees are important factors in readiness. As organizations must adapt quickly, such characteristics are helpful. (Lokuge et al. 2018) Jöhnk et al. (2013) found support for this argument: when knowledge of information systems increases in organizations, and the possibilities and challenges of these systems are communicated clearly, then employees' readiness to utilize the information system will increase. Organizations must be an environment supporting organizational learning (Rafferty et al. 2013) so that employees are able to learn and adopt new methods and practices that are needed in the utilization of information systems (Jöhnk et al. 2013)

3.2.4 Partnership readiness

Partnership readiness refers to the involvement of external stakeholders in an organization’s digital innovation. According to Lokuge et al. (2018), it's essential to maintain relationships with three groups: IT vendors, consultants, and customers. IT vendors and customers are important for developing collaborative innovations; it can be thought that there are more resources when collaborating. Consults are taking long and complex innovation projects to the end and delivering solutions for organizations (Lokuge et al. 2018)

3.2.5 Innovation valance

Innovation valance is described as the positivity of members toward digital innovations. Attitude, motivation, and empowerment were identified as key factors for employees. (Lokuge et.al 2018) Employees must have the opportunity to participate in change and related decisions to enhance organizational readiness. By participating, employees will

experience feelings of empowerment and control over the situation, which will foster a positive attitude toward change. (Rafferty et al. 2013) Lokuge et al. (2018) argue that leaders influence their employees; leaders can change the attitudes of employees through their support and empower the employees to make better decisions and commit to change. On a larger scale, commitment refers to an organization's willingness and support for digital innovation and change (Molla, Licker 2005; Weiner, 2009; Nguyen et al. 2019). Rafferty et al. (2013), on the other hand, suggested that individuals' personal characteristics and attitudes positively affect readiness: the higher the self-concept and risk tolerance, the higher the individual's readiness for change, which leads to higher innovation valance.

3.2.6 Cultural readiness

Cultural readiness refers to organizational culture. In literature, organizational culture has been identified as one of the most important factors for digital innovation. A culture that promotes idea sharing, decentralized decision-making, and low risk aversion increases cultural readiness. (Lokuge et al. 2018) Organizational culture significantly affects organizational change readiness (Rafferty et al. 2013) and information systems readiness within organizations. If there is a positive and open culture towards new information systems and ideas within the organization, it is considerably easier for members to integrate a new system or practice. (Jöhnk et al. 2013) According to Lokuge et al. (2018), the organization's values, norms, and practices are also important factors in creating the right atmosphere within organizations. The organizational culture should be innovative, and the importance of innovation should be communicated within the organization. The organization should encourage collaboration and problem-solving. Change management is also seen as an important part; changes should be prepared well and led according to a pre-planned strategy to carry out tasks as planned while listening to and respecting the parties involved and maintaining a positive spirit within the organization. (Lokuge et al. 2013)

3.2.7 Strategic readiness

Strategic readiness is described as a managerial action in which an organization participates to success in digital innovation (Lokuge et al. 2018) Strategic readiness aims for the entire

organization to have a unified view of the information systems' needs and to ensure that the systems align with the organization's business needs (Jöhnk et al.2013). Lokuge et al. (2018) identified strategy as a critical component of readiness for planning and implementing information system investments. It is particularly important that the strategy and the goals to be achieved are always supported from the top level of the organization and that there is a genuine willingness to invest in them. Rafferty et al. (2013) have similar findings in change readiness; organizations that are ready for change have a strong focus on the future and a commitment to make the best decisions for successful change. A lack of support for information systems, their development, and changes from the top level of the organization undermines the organization's overall ability to respond to challenges. In this context, top-level support and strategy refer not only to financial aspects but also to the strategic formation of organizational culture, as the environment created and the employees within it are the ones who receive and adopt new information systems. (Jönhk et al. 2013)

3.3 Theoretical framework

For the empirical part of the study, a theoretical framework is constructed from earlier discussed theories. Framework combines information system readiness theory with IS business value theory. Information system readiness can be seen as an enabler to reach IS business value. IS business value, on the other hand, can be achieved through organizational value by examining the indirect benefits to the organization. Success in organizational value factors can enhance the value that customers bring to the organization. The benefits derived from customer value are direct and will be seen as financial value within the organization. The theoretical framework is presented in Figure 4.

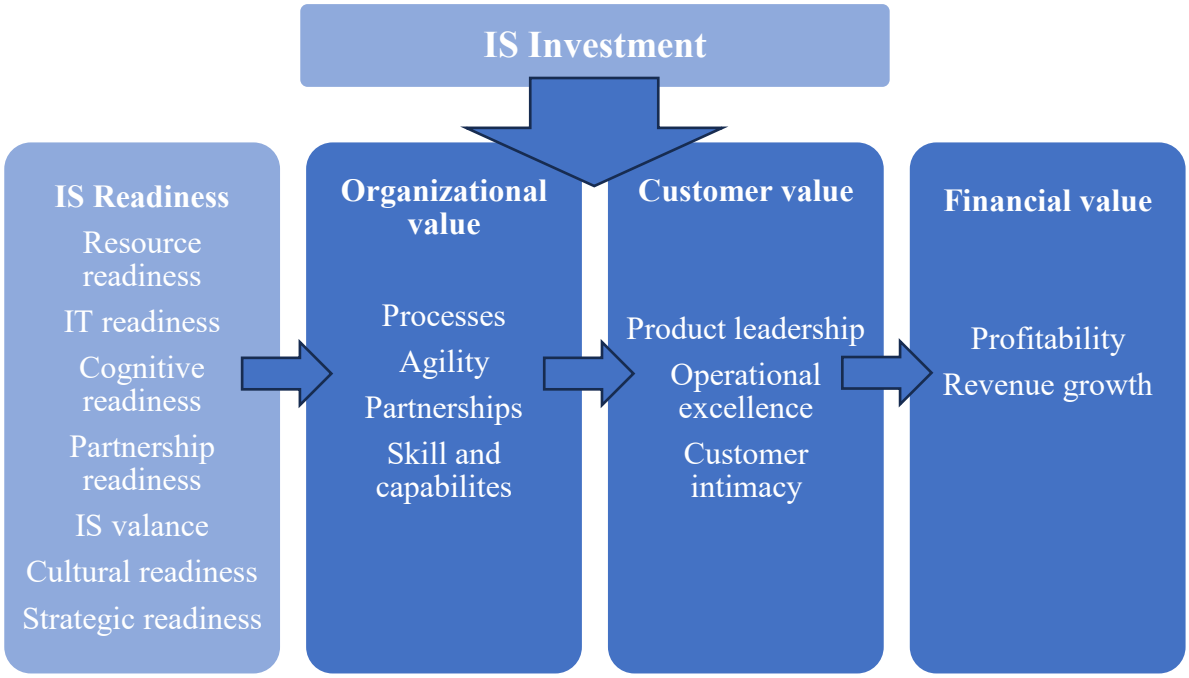

Figure 4. Theoretical framework for the thesis

4 Empirical study

This empirical study aims to find the benefits that industrial organizations can achieve from changing or integrating into a new ERP system. The study is conducted through qualitative research, where organizations are interviewed to determine the benefits achieved by implementing ERP systems in industrial companies. This chapter describes the study's methodology, including the research method, data collection, and analysis methods.

4.1 Qualitative research

This study employed a qualitative research method to gain a deeper understanding of the factors affecting information systems and the potential benefits they bring to organizations. The qualitative research method aims to understand phenomena in depth and comprehensively by gathering specific information about phenomena rather than relying on numeric measurements. (Puusa et al. 2020) Qualitative research can be used when studying abstract themes where collected data can be subjective and descriptive, and there is an ideology that different factors are shaping all the time situations around the theme. (Hirsjärvi, Remes, Sajavaara 2009) Alasuutari (2011) describes how qualitative research data provides a broader perspective on phenomena, which is necessary when studying complex phenomena such as IS readiness and business value.

Readiness for information systems and their perceived benefits are complex phenomena, where various factors influence the results and experiences associated with these systems. According to Molla and Licker (2005), information system readiness refers to the perception and experience of the organization's members. This encourages the choice of the qualitative approach as it emphasizes the subjectivity and knowledge gathered from it (Puusa et al. 2020). This context-specific consideration of ERP change benefits to industrial organizations is necessary to understand the readiness for ERP change and its potential benefits in industrial organizations.

Qualitative research aims to understand phenomena (Kananen 2015), and phenomena are examined from the subject's perspective (Puusa et al. 2020). The main idea is based on the need to understand and enter into the phenomena as deeply as possible. (Saunders, Lewis,

Thornhill 2016) The qualitative method is open, and the researcher should have a preliminary understanding of the topic, which is deepened through the literature review. The researcher's original understanding of the topic can be reassessed after the literature review if necessary. (Puusa et al. 2020) Hirsijärvi, Remes, and Sajavaara (2009) present some common features of qualitative research:

1) the data collection is made from people
2) data is collected via interviews, interview targets are specifically selected,
3) all the results are unique and interpreted accordingly.

The qualitative method enables the interviewees to share their personal experiences, analyses, and reflections on the topic (Saunders et al. 2016). The theory of infromation system change and values requires research from a qualitative perspective, as quantitative measurements alone are insufficient to measure the successful implementation and intangible and tangible benefits of ERP change.

4.2 Data collection

The data collection was conducted through interviews with six different industrial organizations. Tuomi and Sarajärvi (2018) believe that the number of 6-8 interviewees for a master’s thesis is sufficient, as it maintains the amount of data a reasonable while still being sufficient for analysis and drawing conclusions. Interviews are conducted using a semi-structured method, where a prepared set of questions is provided, but the order of the questions can be adjusted, as well as the questions themselves, during the interview if necessary. (Tuomi et al., 2018) The semi-structured method allows for flexibility in interviews, which can lead to the collection of deeper and richer information than in a fully structured interview. Five of the interviews were conducted as individual interviews, and the sixth interview involved three participants from the organization's side. One of the interviews was conducted in person, and the others were held via online meetings. Interviews were conducted at the end of 2024.

All the interviewed organizations were acting in an industrial arena. Selected organizations have undergone ERP changes or integrations over the last five years. This limitation aims to ensure that the benefits of the change remain fresh in memory and that the results remain

relevant in the present time. By interviewing specific industry organizations, the study can provide relevant information considering implementing ERP system changes in the industrial industry. Table 2 presents basic information from the interviewed organizations. The sizes of the organizations varied from 5 employees to 2000 employees, and the revenue range during the organization's ERP change projects was from 4 million euros to 330 million euros. Interviewees were all part of the ERP change project, for example, leading the project, test-using the systems, or as main users of the ERP systems. Although there were not many interviews, diverse perspectives on the topic were created through the different roles of the interviewees.

Table 2. Information of the interviewees

Organization	**A**	**B**	**C**
Industry	Metal subcontracting	Valves	Electric Powertrains
Revenue €	7 million	330 million	20 million
Num. of employees	40	841	90
ERP change implemented	2020	2018 / 2023	2019
Interviewees job description	Production Manager responsible for ERP system change, Production Manager supporting ERP implementation, and Key Accountant Manager from the sales side	Business solutions manager. Operating between IT and business during projects and developing	Sourcing Project Manager, super user in ERP and PLM systems and knowledge expert
Organization	**D**	**E**	**F**
Industry	Welding subcontracting	Industrial wholesaler	Insulation materials and insulators
Revenue €	8 million	4 million	84 million
Num. of employees	40	5	2000
ERP change implemented	2020	2021	2019
Interviewees job description	Development engineer responsible of ERP system change and other projects	Sales Assistant, Order handling, invoicing, logistics, preliminary accounting	IT Development Manager, ERP system change and MES systems

The interview question template is located in Appendix 1. Questions were planned based on the study's theoretical framework, and interviewees had time to familiarize themselves with the questions a couple of days before the interview. The first questions focused on the

background of the organization and the interviewee, and then actual questions about readiness factors, ERP change, and benefits achieved were presented. Challenging concepts have been explained in the questionnaire template, as the interviewees may not be familiar with all the theoretical concepts of IS readiness and business value. Interviews lasted approximately 45 to 80 minutes, depending on the interviewee and the number of additional questions asked by both sides, the interviewer, and the interviewee. Interviews were recorded, and transcriptions were written out to wait for later analysis.

4.3 Data analysis method

In this study, qualitative content analysis was used as the analysis method. The aim of qualitative content analysis is to describe, understand, and interpret the phenomenon being studied in greater depth, thereby enabling the researcher to gain a deeper understanding of the research subject through the data. (Juuti et al. 2020; Tuomi et al.2018) The goal of content analysis of the research data was to uncover, describe, and understand the meanings inherent in the data (Eskola, Suoranta 1998). In qualitative research, content analysis is a central method of analysis that allows the systematic and objective examination of data in written form, such as interviews, letters, diaries, or reports. This method enables the structuring and summarizing of data to facilitate the drawing of conclusions. (Juuti et al. 2020; Tuomi et al.2018)

In the analysis, the data were thematized. Thematization can be considered either a subtype of content analysis or a separate, independent analysis method (Tuomi et al. 2018). Through thematization, the most significant topics in the data can be identified (Eskola et al. 1998; Tuomi et al. 2018). Thematization links the empirical data and theory to each other. From fragmented data, a coherent whole is formed by summarizing and condensing the content, allowing for justified conclusions about the studied phenomenon (Puusa et al. 2020).

The analysis will be done by theory-driven content analysis. The analysis is done by analyzing the findings from the data and comparing them to existing knowledge and theories. The theory does not completely dictate the course of the analysis process; observations are also made from the data, and the information is integrated between the theory and the data. Through theory-driven analysis, a theory can be examined in a new context or environment, and empirical data analysis can be supported by theories. (Tuomi et al. 2018) In this study,

IS readiness and business value theories are linked to empirical results of ERP change in industrial organizations. Theory-driven analysis can bring new insights and perspectives to the topic when theory and empiria are connected (Tuomi et al. 2018).

The analysis started with transcribing the interviews. Every interview conducted resulted in approximately 15-20 pages of transcribed text after removing irrelevant parts. After transcription, each interview was read multiple times to gain an overall understanding of the data. Commonly recurring expressions were searched for in the data and highlighted. After this, the frequently recurring topics were listed, and their similarities and differences were identified. Table 3 provides an example of how the data was grouped from expressions to main categories. Similar expressions were grouped together and consended. Each expression was formed as a subcategory that described its characteristics. In the final phase, the purpose of the formed main category is to simplify and conceptualize the group for the study.

Table 3. Example of data categorizing

Expression	Consended expression	Subcategories	Main category
"Our production monitoring and capacity tracking are now in graphical form in our new system, making it much easier to follow."	Easier to monitor production and capacity	Production, production capacity, and material flow planning and monitoring	Efficiency and visibility
"Now, our production planners can see it in the ERP system in advance, allowing them to optimize our production based on material availability, so there's no standing around with hands idle."	Material availability is visible, production can be planned accordingly		

5 Empirical results

The interviews were analyzed based on the themes that emerged from the material and theoretical framework established earlier. This chapter presents the study's research results. First, the results of industrial organizations' information system readiness levels are presented. After that, the findings of the possible benefits of ERP changes are highlighted. Lastly, this chapter analyzes the case organization's information system readiness and the potential benefits of ERP change based on the findings made in this study. The aim of the analysis is that when the case organization is aware of all the possible benefits, it has better opportunities to achieve them.

5.1 IS readiness

All six organizations were able to evaluate their information system readiness stage when the ERP change was started. The organizations evaluated seven different factors at low, medium, or high readiness levels. The answers to the organizations' questions can be found in Table 3.

Table 4. Summarized IS readiness stages of interviewee organizations

IS readiness	Organizations' distribution in the IS readiness stage		
	Low	Medium	High
Resource readiness	1	0	5
IT readiness	2	3	1
Cognitive readiness	0	4	2
Partnership readiness	0	2	4
IS valance	1	3	2
Cultural readiness	1	1	4
Strategic readiness	1	2	3

Overall, the strongest readiness was observed in resource readiness, with five of the organizations evaluated rating it as being at a high stage. Organizations had sufficient financial, technological, and human capital support to initiate the ERP change project. Only one of the organizations felt that they had a lack of recourses. Partnership readiness and cultural readiness also appeared to be at a good stage; four of the organizations felt that these readiness factors were strong, and none of the organizations described the partnership readiness stage as low. IS valance and strategic readiness were the most fragmented factors among the organizations, and answers varied between describing readiness from weak to strong. The most challenging was IT readiness; only one of the organizations felt that their IT readiness was their strength. Three organizations described it as a medium stage, and two of the organizations identified IT readiness as a weakness. Readiness stage answers, as provided by each organization, are collected in Appendix 2.

Resource readiness

Resource readiness seems to be a strength in industrial organizations. It was felt that organizations had the ability to support ERP system change enough in financial, human capital, and technological aspects. Some of the organizations had the readiness within their organization, and they were even able to obtain financial support from outside the organization for the change. In some cases, after an acquisition, the organization may receive support from the acquirer to implement changes. If organizations lack resources, they can get them by hiring people or investing in new technologies.

> "In practice, we had high readiness to make ERP change, as we have a lot of talented and experienced people working globally and supporting the change"
>
> "--I was hired to lead this bigger change project— it was realized that other investments were needed too and we created a large project and got financial support for the project from ELY- center—technological infrastructure was updated to answer new ERP systems needs"
>
> "After the acquisition parent company was investing financially in us -- we were able to hire more people and got a technological infrastructure from the parent company"

Only one organization indicated that its resource readiness was low. Missing one important resource can transform readiness from a strength to a weakness. Although the ERP change was financially and technologically in good shape, the lack of human capital undermined the project's strong foundation.

> "We did not have enough resources, we had not enough employees—financial resources were in good level and technological infrastructure could be bought, but human capital resources were minimal"

On the contrary, a lot of time and resources were invested to get the best result for the ERP change. Weekly meetings were described as brief but useful for keeping everyone on track with what had been accomplished and what would be done, which helped commit people to the project.

> " there were 84 weekly meetings, 16 times counseling group gathered - - white collar level used almost 5000 work hours - - and blue collars 300 work hours to the ERP change project"

IT readiness

The organizations' IT readiness was more fragmented. Only one felt that their IT readiness was strong, while three described it as average. Modifying the data to fit new systems was time-consuming but not impossible, and it was seen as important that data was processed before the ERP change.

> "There was a lot of ready data, but also there was data that must be modified to fit the new system. Data volume was high and help was received from ERP supplier"

> "We had quite a good situation with the data material and transferring the data was not the problem. But we didn't know what part of the data is useful in the new system and what not - - unusable data would have been good to clean away to get better quality - - should have done more research before hand"

> "Even though the data quality was not that good in the beginning we always managed to transfer it - - we have a quite good process for this and usually we manage to find the problematic spots before going to the new system"

Processing large amounts of data requires time from employees and transparent processes to manage the data effectively. Quality may decrease if there is not enough time and knowledge to sort the data properly. One of the companies identified IT readiness as a weakness.

> "Approximately 10 % of the old data was usable, I filled a Excel sheet that included around 50 000 lines manually - - all the material descriptions were missing - - the most work demanding part of the project"

It takes time to create new information that data needs for successful transfer. Automated processes will help data process, and it's easier to sort a large amount of data with automated processes than create new information manually.

Cognitive readiness

None of the companies felt that their cognitive readiness would have been weak. Four of the organizations answered that their cognitive readiness was average, and two organizations described it as strong. The industrial industry seems a bit stiff in changes.

> "Always when you take something new to the male-dominant industry - - there raises the resistance of everything - - basically people assume extra work and are scared about monitoring - - mainly everyone has skills to learn to use new ERP"
>
> " We are an industrial company and we have a lot of "old-timers" which is known as a resistant people - - change is not taken so well"
>
> "It's a big change, but usually people have knowledge and skills - - people familiar with computers do find quickly practice how the ERP works. And those who were not so familiar needed more support and time to learn that it doesn't work the same as pen and paper"

Even though people have the skills and knowledge to use ERP systems, it is essential to ensure that everyone understands why ERP change is important to decrease resilience. Besides resilience, some of the organizations recognized a lack of knowledge.

> "We had to test the system without knowing anything - - we should have had a little training before the test phase".
>
> "I brought some know-how knowledge when they hired me, there were consults to help us - - if you didn't manage to create very specific questions to a consultant or a colleague, you got low-quality answers because there was no

> understanding of what's the difference between parent company's business and our business”

Communicating with colleagues or consultants can be challenging if there is a knowledge gap on either side, whether in asking or answering questions. However, if all participants have a basic understanding of the business and its systems, cooperation will work efficiently.

Partnership readiness

Industrial companies generally describe partnership readiness as a strength. Four of the organizations evaluated their partnership readiness as being at a strong stage.

> “ We had a lot of partnerships and the need for partners changed. We needed a model of running production and we went to another country to see how our colleagues were using it – an ERP consultant was there with us to help us ask the right questions from our colleagues”

> “ All the colleagues around the world, consults and vendors were gathering always somewhere together - - there was a lot of effort to make us get to know each other- - MES system vendor was also participating “

> “ ERP vendor and their consultant were supporting the change, our IT house was supporting with technical issues - - some little discussion with customers of their wishes”

ERP vendors participated in every change and supported organizations through the ERP change process. Customers were not seen as necessary when implementing ERP changes, as sales may have their own systems for customer communication, or customers may not have a connection to ERP systems.

> “ System vendors were supporting us but customers weren’t affected anyway. The change was mandatory to us - - we won’t ask customers' opinions, they just get a bit different-looking order confirmation papers”

> “ Customer communication happens through the sales portal so they are not affecting to ERP project - - sometimes we have done ERP development according to customer needs, but usually they are not involved in ERP change projects”

One of the organizations mentioned that the partnership needs communication to succeed.

> "Quite a well ERP vendor has been supporting us - - none of us had the capability to inform the vendor of all our needs and get all the advantages of the consults knowledge - - the answer came when you were able to ask the right question"

If organizations are unable to articulate their needs and ask the right questions, they will not be able to fully leverage the consultations and the ERP system. Having a partner is not enough; there must be open communication, and both parties must understand each other.

IS valance

One organization evaluated its IS valance level as a weakness. Mandatory changes didn't make employees excited about the changes, or perhaps even the age of the employees affected their ability to accept changes.

> " It was a mandatory change for us so it creates resilience, we are a bit old and we don't want to learn new things"

There were also differences between employees of different organizational levels. Some are more flexible in adjusting to new changes than others, even though it seems that it's important to give everyone a chance to participate in the change. Organization size also affects the capability to involve people in the change.

> "White collars have been receiving the change quite a well - - change resilience is stronger among blue collars and with those how need less the systems features"
>
> " In theory, we gave everyone a chance to participate in some way and made questionnaires - - some of the people were very motivated and asked a lot of questions and some were not interested all as they thought it wasn't considering them"
>
> "The white-collar level has more abilities and willingness to receive new information and take new features on use. Blue-collars don't want anything new, they are happy with what they have"
>
> "Always new functionality is disliked by some people - - these people should get involved enough early stage and explain why the change is needed - - it's challenging to involve all people in a large organization"

Two of the organizations described that their IS valance was the strong stage. A positive attitude and good team spirit are associated with a higher capability to cope with changes. People are committed and believe that they have the capability to make it through the change well. Choosing the right people to lead system change is crucial so that a positive spirit among employees is supported.

> " In the project lead were chosen people with good attitudes and willingness to answer the questions. A small team made a good team spirit. And management wanted to involve the lower level - - responsibility was given to the ones who had the knowledge"

> " People were excited about the project, committed to staying on a schedule and learning as much as possible, and wanted to fix the issues. They just gave their best"

Cultural readiness

Four of the organizations described their cultural readiness to be strong. Taking into account all participants in the change, from top to bottom, and supporting the change with open discussions and a safe space to express both positive and negative thoughts. Additionally, all employees were involved in the change process, and decisions were made regarding the implementation of the change. Top management communicated the change and its benefits in a positive manner.

> " Culture towards change has been positive and all the users have been taken an account and made sure that they have the readiness to work with the new system - - management let the employees choose the system"

> "The message from the management was clear that they are supporting the project and they are keeping the project on an eye. There was a counseling team where employees from every level could tell their point of view on the ERP change project. - - people have been listened to, given space to speak also the negative thoughts and supported to go on and solve the problems"

> "The whole organization is positive towards changes. - - even though the change was mandatory, the positive sides of the changes were presented and a positive mindset towards the change was helping. The parent company had been supporting us financially and we had enjoyed the benefits of better connections via the parent company, it was easy to convince that ERP change would bring more benefits"

> " Our culture is open towards changes, the environment was safe to tell own opinions and ideas and decisions are made together"

Two of the organizations felt that their cultural readiness was average or even weak. The size of the organization makes it challenging to implement organizational culture and sustain decision-making. It's challenging to create an open culture for change if top management is not committed to change and retains control over all decisions.

> " Maybe it could be said that organization culture is against the change, or not maybe against, but we are slow to receive changes and make developments. Everything can look good on paper, but still, it takes a long time before it is in use and it needs a lot of discussions - - centralizing all, as the goal seems to be in our organization, will ruin all the decision-making in lower levels"

Strategic readiness

One of the companies felt that its strategic readiness was weak. Change management caused challenges as the new top management had not been involved in decisions made earlier, and they had no resources to focus on the change at the same time as ownership changes. A lack of commitment from management and a missing strategy cause uncertainty among employees.

> "There were changes in ownership during the ERP change, and those people who started the change were not in the company anymore during the practical part. New owners had nothing where to hold on they just had to adjust the situation – new management had no resources to focus on the change"

Two of the organizations describe their strategic readiness to be at an average stage. Organizations have strategy, but the ERP change and the actions it needs may not be fitting to the strategy. This creates confusion among the employees and will decrease commitment to the change.

> " Focus is on certain topics and those topics come from the strategy and ERP change should support the strategy - - but sometimes in a lower level doesn't agree with the things that should be done - - those things don't always fit the given strategy"

Organizations that were evaluated on their strategic readiness as their strength felt that the board and top management were genuinely interested in the project and wanted to support it, and the ERP change aligned with the organization's strategy. The strategy was

communicated to lower organizational levels to foster a positive mindset among employees regarding the bright sides of the ERP change.

> "Organization board had a professional governance member (outside the organization) who was mentoring ERP change leader - - the board was committed to supporting the project in all matters - - board wanted strongly to consider how decisions will affect to employees"

> " Making the ERP change is according to our strategy. We need support from the parental company through ERP - - 24/7 ability to communicate - - top management "sold" a story for a better future after the ERP change"

Some of the factors are affecting each other, but the connection is challenging to prove, as it is difficult to determine which is the cause and which is the effect. However, in interviews, two perspectives were raised where interviewees felt there was a connection. Resource readiness was connected to IT readiness, partnership readiness, and strategic readiness. A lack of resources, mainly a lack of human capital, affected other readiness levels. There was no employee who had the time and understanding to focus on developing IT readiness, discussing with partners, and building a strategy for the ERP change project. Another perspective was that cognitive readiness affects partnership readiness. It was felt that if the organization and its members lack the ability to communicate effectively with partners and learn to ask precise questions, they are unable to fully benefit from the partnerships.

5.2 ERP change benefits

All the interviewees were able to identify the benefits brought about by the ERP change. Four of the organizations achieved significant benefits from the ERP change, and two of the organizations experienced some benefits, although not significant ones. The difference between these organizations lies in the organizational levels at which ERP changes were implemented. All four organizations that got significant benefits implemented the ERP change at the blue-collar and white-collar levels. There were benefits in the production and white-collar tasks. In the two organizations, ERP change was not affecting the blue-collar level at all or only slightly, and they didn't find that many benefits from the ERP change. The ERP change benefits observed in the interviews can be categorized into seven distinct areas, as outlined in Table 4.

Table 5. ERP change benefit areas

Observed benefit areas	Examples of benefits
Efficiency and visibility	Visibility to production and material flow Production optimization Better time allocation Automated operations
Data transfer and accuracy	Accurate real-time data Systematic product quality control
Consolidated systems, practices, and decision-making	Better information sharing Common practices through organization Unified ERP system
Internal and external relationships	Unified supplier networks Expanded internal cooperation
Individual skills	Individuals change for readiness improved Training for ERP usage faster
Customer Service	Faster response time Better quality and accuracy in service
ERP as an enabler	ERP enables efficient growth

5.2.1 Efficiency and visibility

The ERP system changes enhanced strategic planning. Organizations felt that they gained better monitoring opportunities and visibility of what was happening in production. Better visibility also improved material flow, which in turn helped with production planning and purchase orders. ERP gathers important information and provides everyone with the opportunity to utilize it in planning and decision-making.

> "production monitoring and capacity monitoring is now in a graphical form - - it's is much easier to follow"
>
> "before it was only in someone's head what is done and when in the machines. Now there is clear visibility about workloads of the machines"
>
> "production planners can see the information from the ERP beforehand, they can optimize production according to material availability"

> “From both the purchasing and production side, you are able to plan purchase orders and production more effectively”

Better planning brings flexibility to prioritize and allocate time optimally. The ERP change enhances the capability to determine the actual manufacturing times of products and compare them to planned manufacturing lead times. Mistakenly calculated production plans could be fixed, and the profitability of the manufacturing increased. One benefit that was noticed was that the ERP change had freed up employees' time, as they no longer had to attend numerous meetings about production or material status since everything was planned. The organization's perspective was that this was a return on assets as ERP released employees’ time for more valuable tasks.

> “we can dig into information which products are preferred to be in manufacturing at the same time and it brings flexibility”
>
> “production planner can follow (production) and make priorities - - (plans) can be changed every day”
>
> “ we could compare why it has taken this long compared to the planned time to machine the product and find out the reason and fix it”
>
> “ things came easier, no more running at status meetings”

Besides planning and optimization, organizations found that ERP system changes provided an opportunity to automate tasks from sales all the way to production. Manual work decreased when all the information flowed from sales to the next departments in the ERP, eliminating double work. Documentation can be saved in an ERP system; for example, material certificates are linked to the products online. ERP can include features that automatically generate mandatory documentation (as required by EU legislation) for imported products.

> “internally it’s easier when everything from quote to sales and on to purchasing is moving in the same chain. It makes procecces faster and decreases manually done double-work”
>
> “There is some EU legislation about information that is needed when importing product out of the country, new ERP can create this information automatically and it decreases amount of manual work”

One of the organizations also recognized that the automation ERP brings to the organization will lead to revenue growth. ERP is automating many processes, reducing the need for as many human working hours to achieve the same level of profit as previously. Revenue can be significantly higher before a human employee has to make efforts to generate a profit.

> " Certain amount of money just comes with that the ERP is doing it's work and extra efforts like re-scheduling purchase orders or reacting to suprising events comes later"

5.2.2 Data transfer and accuracy

ERP changes brought benefits in data transfer and accuracy. Organizations believed that the ability to provide everyone with real-time visibility to the data was a significant benefit. Based on real-time data, decisions can be made to efficiently manufacture something or serve customers with urgent needs. ERP provides a clear picture of every moment and gives a forecast for the future.

> "ERP is all the time up-to-date of the production"
>
> "You can see everything in the real-time, including what has been scheduled for the future"
>
> "When seeing real-time capacity, if we receive some urgent request, we see easily the capacity situation and we don't have to be guessing"

Product data and information can be transferred to an ERP system. Organizations viewed it as a benefit that, within an ERP system, they could define which products are ready for sale, allowing the sales department to stay on track with all available products. Real-time data transfers benefit developing product leadership as all the changes in the ERP are also available in the sales department. This has been seen as a helpful feature in quality control.

> " In the ERP is defined products as an available for sale and all salespeople can see globally what can be sold"
>
> "other subsidiaries can also sell our products when they see all the products and where everything is"

> "sales can be unified (merger/acquisitions situation), so that we can offer products in the same package (from the ERP), which supports the smaller organizations"
>
> " The status of the products in the ERP systems transfers to - - our sales team. In all quality situations sales block can be placed and everyone gets the information immediately, no calling around to tell them not to sell"

Besides real-time data transfers, the ERP system changes improved data accuracy. Organizations felt capable of utilizing the data because it was accurate and easily accessible. Reported data could be used in negotiations with suppliers and customers or in analyzing product costs. Accurate data on claims and their costs will make it easier to identify areas for increasing profitability.

> "new features help to negotiations with our customers, example OTD report can be compared from both sides"
>
> "when the data is in order, it's easier to negotiate prices with suppliers and discuss how to develop relationships with the suppliers."
>
> "benefits come from that we get data about the claims and the cost that they cause"
>
> "In a new ERP, we can make a cost analysis of the ready product data and get an estimate about actual profits"

5.2.3 Consolidated systems, practices, and decision-making

When everyone has access to the same shared information via the ERP system, planning and decision-making are easier, as they are based on a shared understanding of knowledge. Shared ERP systems establish common processes that are used by everyone in the organization. This makes it easier to ask for support or help from colleagues. Organizations pointed out that it's beneficial if best practices are shared over the organizations from one colleague to another. Independently created processes and practices are expensive for the organization compared to common ones. An ERP system can also prevent issues on the sales side when the ERP requires people to fill in mandatory information to the system and provides instant feedback if there might be potential problems with the product. Individuals don't have to hold all the knowledge of the topic; ERP is there to support individuals.

> " New ERP system brings all the planning and decision-making closer to shared common perspective"
>
> "Common processes make it easier to ask for help from colleagues"
>
> "one ERP used among the organizations brings up the best practices and everyone is not operating independently"
>
> "Customers can ask for anything and if there is no knowledge take this account things can go wrong very fast. But the new ERP system requires to fill all the mandatory fields, and it gives immediate feedback (impossible products)"

Many of the recognized benefits were connected to the number of systems and databases. If everyone is using the same customer data in the ERP, anyone from the organization can access information and serve the customer. The gaps in the knowledge are reduced. Another benefit of focusing on using a single common system within the organization is the savings it provides. Having a single ERP within the organization will be more cost-effective than maintaining multiple systems simultaneously.

> "All have common customer interface, one customer data set, organization is able to serve the better customers and it increases flexibility"
>
> " if many systems can replaced by one ERP it would directly reduce maintenance costs"
>
> " In the long run, if we have multiple ERP systems in the organizations, it will directly bring cost from the maintenance and other related costs.

5.2.4 Internal and external relationships

Organizations have recognized the benefits of ERP to internal and external relationships. The ERP change has enhanced internal cooperation among colleagues, and at the same time, organizations have been able to expand their internal and external networks.

> "-there has been a lot of (internal) cooperation earlier and now it has deepened even further"
>
> "in that sense, it has been expanded, the networks"

In some cases, benefits were found from a unified supplier network. Purchased simple basic parts like screws could be purchased from one supplier. By combining the purchase needs, it was possible to get volume advantages in purchasing.

> "ERP change enabled unified supplier network, no need to order screws, etc. basic parts from different suppliers"
>
> "If other factories are using similar raw materials we can consolidate purchases"

One of the interviewees describes that the new ERP systems have more developed skills for support. Organizations can achieve better functionality from ERP systems when the system vendor or consultants provide efficient assistance. Better functionalities will lead to better capabilities.

> " New ERP versions with a support, there can be received from the vendor or consult network better functionalities and it directly enhances capabilities"

5.2.5 Individual skills

An ERP change can be described as one of the most significant transformations an organization undergoes. This type of change project will teach individuals within the organization to adapt to changes. Employees can learn a great deal about the change. One opinion from the interviews was that everyone should face an ERP change project at a young age, if possible, due to the valuable learning experience. Skills will be learned during the change process, and recognizing them will take time.

> "ERP change is one of the biggest changes in organizations, it will inevitably teach organizations employees at an individual level to adapt to changes"
>
> " the five years experience (which I had before change), if I compare present myself to that time, actually I did know nothing back then"
>
> "Skills are something that you might not even notice yourself that you have learned, they come along the way"

It’s considered important that the ERP system is easy to learn for new employees. Nowadays, people rarely stay in the same workplace for their entire careers, and job mobility is common. New ERP versions are usually easy to use, especially for younger people, as they often have the skills to use apps from their personal lives. Time and money used for ERP training can be minimized.

> “ If planned well, training new employees becomes much more easier and I think it is a competitive advantage”

5.2.6 Customer Service

ERP change has enabled several benefits in customer service. Organizations can provide rapid responses to customers, including urgent requests. In addition to faster response times, it is believed that the quality and accuracy of the answers provided to customers are improved.

> "If we think customer service and other stuff - - it might be easier to find or see the capacity if there are urgent requests from customers, it's easier to see the actual capacity situation, so there's no guessing (of delivery time.)”
>
> “But globally, every employee is able to see the standard delivery times, and can respond more quickly to unexpected customer requests.”

Features in ERP systems that respond to organizations' needs enhance communication between organizations and their customers. Reviews between customers and organizations can be made when there are opportunities for reporting and data collection. The reports and data in the system are easy to share with customers, even dangerously easy, according to one interviewed organization.

> “Some features are significantly better and easier to find than in the old system, and probably even more could be found. - - these quarterly reviews with customers, regarding OTD are more clear.”
>
> “It has (customer intimacy) dangerously increased because some of our salespeople who know how to use our new ERP system well can see very detailed data and sometimes they share a bit too much with the customer. In that sense, new ERP has helped very much”

Customers are receiving responses faster and even automatically. Manual work, such as sending emails back and forth, is reduced by ERP changes. As organizations are able to answer customer needs quickly and, in some cases, automatically, it will bring growth to the organization.

> “When we move away from email to somewhere else, it generally improves customer service capabilities. - - producing documentation automatically to a chosen place where the customer can get it, compared to sending emails from different places. It definitely increases customer interaction.”
>
> “we can respond more quickly to unexpected customer needs, and yes it brings like growth that is not organic anymore”

5.2.7 ERP as an enabler

One benefit of ERP change was its capability to enable things. Organizations felt that the ERP system enabled revenue growth. ERP systems must include specific features and capabilities to enable efficient transactions and decision-making. This will provide an opportunity for growth. Revenue growth is not possible without an ERP system that supports it.

> "But, but I could say that it has probably created some kind of opportunities. If it has created new opportunities in production planning to us, there will probably also create opportunities for revenue growth in some time line.”
>
> “New ERP systems generally provide better capabilities, which then may be the competitive advantage.”
>
> “It enables growth for the future. If the growth comes, we are able to make transactions more efficiently and report certain things."

5.3 ERP change business value for case organization

Every organization has its unique environment and starting point for ERP change, and it needs to be evaluated which factors could enhance the business value of the case

organization. Table 5 gathers ERP change benefits that can gain organizational value for industrial organizations.

Table 6. Factors enhancing organizational value in industrial organizations

Organizational value	Improved factors that enhance value
Strategic planning / informed decision making	Visibility to production and material flow Production and capacity monitoring/planning Material flow planning Purchase order management Accurate real-time data Unified decision-making Common practices
Flexibility/ Agility	Accurate real-time data Unified databases Time allocation
Strategic alliances/supplier relationships	Accurate real-time data Unified supplier networks Expanding internal/external networks
Enhanced skills and capabilities	Individual skills Individual adaptability Support of the networks

Organizational value from ERP change

In the stage of strategic planning and informed decision-making**,** the case organization's current ERP system is quite strong, especially on the financial side. The current ERP provides good visibility to accurate, real-time data. After receiving the orders, the ERP system will reserve the needed materials and guide the purchase of missing materials. In the system, reorder points can be set to achieve efficient material flow, but order quantities have no specific place. Order quantities are saved to the system through creative adjustments made by the purchasing team, such as adding information to other columns. A new ERP system offers the ability to set order quantities, thereby reducing reliance on human memory and enhancing purchasing operations.

Changing the ERP system will enhance production monitoring and planning. The current ERP is more substantial in financial management than in production use. Production will

gain better visibility of their data and instructions for production; all will be in one place. This will reduce reliance on human memory, decrease the number of mistakes, and smoothen up the processes to be more efficient. Integrating into the same ERP system will unify decision-making. In all the planning and decision-making, everyone has visibility to the same information and data through the ERP. In addition, using the same ERP creates common practices and processes, making it easier to ask for support and help from colleagues, as we are familiar with each other's working methods.

In the sense of flexibility and agility, integrating ERP systems will bring benefits to a unified master data and customer base and data. Having all master and customer data in one place helps to find relevant information and serve customers from any unit within the organization. Additionally, if capacity status can be easily viewed throughout the organization, there is the ability to react more quickly to urgent customer needs. At the same time, it can be observed that the current ERP system's response and delivery times can be unrealistic. Tricks can be used to get a faster response and delivery time, but this may leave informational gaps and make it challenging to trace events. The new ERP system won't allow these shortcuts, which cause numerous challenges in daily operations and require extra time for employees to resolve the problems.

From the point of view of time allocation, office employees will save a significant amount of time when customers, both inside and outside the organization, cannot demand the "fast lane" for quick service. This provides employees peace in operating according to planned processes and saves time from problem-solving. The new ERP system will also enhance production time allocation. Production can monitor their operation better in the new ERP system, which will release time for actual doing instead of wondering what can be done next. When production is aware of its status and workload, it can more flexibly take on urgent cases without disrupting the work that is already ongoing in production.

Integrating the ERP system will bring benefits by unifying supplier networks. For the basic bulk material, unifying vendor network fill brings unified places where to order, for example, screws. This creates an opportunity to get volume discounts. Additionally, the higher volume will provide a stronger bargaining position in negotiations with suppliers regarding prices, delivery times, and billing terms. Integrating a new ERP system is necessary to achieve these benefits, enabling the case organization to provide accurate data to suppliers. The case

organization's internal network will expand, allowing people to easily communicate about best practices with one another throughout the organization when using a single ERP system.

ERP integration will bring new skills and capabilities to individuals. Most employees have already experienced an ERP change, as the case organization implemented the change in 2018. New employees who are not yet faced with an ERP change will learn new skills along the way, and experienced ones will strive to avoid repeating the mistakes made previously. By integrating the ERP system, the case organization gains the opportunity to become part of a larger entity, enabling growth as it aligns with the parent organization's operations. The case organization can leverage the knowledge and networks of the parental organization to enhance its skills and capabilities.

Several factors influence product leadership, operational excellence, and customer intimacy, ultimately enhancing customer value. Table 6 gathers these factors. Some of them overlap with factors affecting organizational value, such as accurate real-time data and time allocation.

Table 7. Factors enhancing customer value in industrial organizations

Customer value	Improved factors that enhance value
Product leadership	Accurate real-time data Product quality control
Operational exellence	Time allocation Accurate real-time data Individual skills Automated operations
Customer intimacy	Visibility to production and material flow Accurate real-time data Response time Information sharing

Customer value from ERP change

The new ERP system shifts the mindset in product management from the approaches the organization is used to. In the current ERP system, the case organization has learned to

promise customers product solutions that have not been planned within the organization. Often, it is only after a customer has placed an order that the organization begins to consider how to fulfill these requests. In the new ERP system, nothing can be confirmed to the customers until the product has been designed and approved at the system level. While this may be seen as reducing service flexibility, it will enable the organization to offer customers fully developed solutions in the future and save a lot of time when half-planned products end up in the production line. This will also enhance product quality, as the organization has sufficient time to design and plan the feasibility of the product.

A new ERP system can bring benefits to the operational side of the case organization. One of the significant benefits will be in data transfer. Currently, there is a need to manually transfer information from one ERP to another. This time-consuming phase will end when there is only one ERP system used. The documentation in the current ERP system is manually created, which causes problems in tracking products as all the necessary documents must be manually retrieved from various files and systems. The new system will provide automatic solutions for product tracking. Benefits can also be seen in production; there has not been the ability to follow up on the times how long it takes to manufacture a specific product. This information can enhance production efficiency as well as product price planning.

Integration with one ERP system provides visibility for the parent organization to view data from case organizations and vice versa. This enables all the employees around the organization to have access to information that is needed to share with customers. Response times for customers will get shorter, and information shared will be real-time accurate information, not estimated guesses given by employees. Customers can be easily informed of the situation. In the current situation, there may be a long response time to customers as employees have to ask around to get the information instead of checking it themselves from the system

Table 7 gathers the factors that may improve the financial value of the ERP change. The list of factors affecting profitability, revenue growth, and return on assets is shorter than in organizational and customer value, as evaluating the financial value of the ERP change is more challenging.

Table 8. Factors enhancing financial value in industrial organizations

Financial Value	Improved factors that enhance value
Profitability	Production and capacity monitoring/planning Production optimization Claim monitoring Cost analysis Common practices Unified supplier networks
Revenue Growth	ERP transaction capabilities Automated operations Customer service
Return on assets	Time allocation Unified ERP system

Financial value from ERP change

The new ERP system will bring better visibility to production. Accurate data on production times, capacity, and product availability will enhance production effectiveness by enabling the correct pricing of products, optimizing production operations, and providing better customer service. These lead to improved profitability within the organization. The ERP change also unifies the supplier network within the parent and case organizations, enabling the negotiation of higher discounts on parts, transportation contracts, and billing terms. Savings on the supply chain will increase the profitability of the case organization. Besides unified networks, a new ERP system unifies employees by establishing common practices. Best practices can be shared and utilized throughout the organization, resulting in savings over an extended period.

It was observed that switching to a more advanced ERP system brings greater benefits to revenue growth when an organization transitions from a basic, smaller-scale ERP system to a more versatile, modern system that supports larger-scale business operations. The case organization's current ERP is a modern, large-scale, and suitable system; however, ERP change can still bring benefits to the organization. The more the new ERP automates operations, the less time employees need to spend to achieve the same results as before, and the freed-up time can be used for more productive activities. Besides, when hopping

between ERP systems ends, there is time for better customer service with better response times. Satisfied customers are beneficial to a business and contribute to its potential growth.

The returns on assets that ERP can bring are challenging to evaluate and recognize within organizations. One benefit that is easy to recognize is when multiple ERP systems are consolidated into a single system. By moving into a single ERP, the organization eliminates duplicate costs associated with maintaining, updating, and developing multiple systems. This streamlined approach not only reduces expenses but also simplifies IT management and enhances overall operational efficiency. Additionally, the time saved by operating with only one ERP could yield a return on assets. Employees are saving valuable working hours for other tasks instead of resolving issues between two different ERP systems.

6 Discussion

This chapter answers the research questions, summarizes the key findings of the empirical study, and reflects the results to the theoretical framework and previous research literature. The first subchapter discusses IS readiness and answers a second research question. The second subchapter focuses on the benefits of the ERP change and answers the third research question. The third subchapter answers the main research question regarding the information system business value.

6.1 IS readiness in industrial companies

The success of an information system depends not only on its implementation but also on how well it is adapted and utilized by the organization. Successful adaptation and use depends on the IS readiness level. The model of organizational readiness for digital innovations encompasses seven factors that influence an organization's information systems readiness: resource readiness, IT readiness, cognitive readiness, partnership readiness, innovation valance, cultural readiness, and strategic readiness. The high or low state of these factors affects the organization's capability to adapt to IS.

Resources were crucial for the organizations, and resource readiness was at a high level in industrial organizations. Organizations need financial support to get all the necessary help for ERP changes. Skilled and experienced personnel with sufficient time to support the change process were necessary, as well as an updated technological infrastructure to meet the new ERP system's requirements. IT readiness involves ensuring data quality and management, as well as the capability to utilize automated processes to efficiently handle large volumes of data. IT readiness was the lowest readiness factor in industrial companies, as it was perceived to cause the most work, given that data requirements between systems are always different. It takes a lot of working hours to adjust the data.

Cognitive readiness has a significant role in the successful adaptation of IS in industrial companies. Industrial companies must improve their cognitive readiness, as employees have been recognized to have a resistance to change. Providing training and sharing information with employees helps decrease resistance and increases their understanding of the new

system and its benefits. Additionally, effective change management strategies are essential to address resistance, particularly in industrial companies with a large number of long-term employees who are not easily adapting to change. In this matter, it's essential to remember that there are always individual differences, despite generalizations being made.

Partnership readiness needs clear and open communication with ERP vendors, consultants, and partners. Organizations must collaborate closely with their partners to leverage their knowledge and support through the change process. An important aspect is that both sides in these relationships must understand each other; communication gaps make ERP changes more challenging. The industrial organization has a high readiness level to utilize partnerships in ERP change.

IS valance, the overall attitude and team spirit towards the change, was seen as a critical factor. Creating a positive attitude and fostering a strong team spirit throughout the organization can significantly impact the success of ERP adoption. Involving employees early in the change process and ensuring that they understand the benefits of the change can help achieve the successful adaption and use of the new ERP system. IS valance is at a moderate in an industrial organization; there is a willingness to involve employees in order to achieve high commitment to the project, but practical implementation depends on the organization's size and individuals' interest in participating.

Cultural readiness within industrial organizations is average. Creating a culture that is open to change and supports employees in the adaptation process is challenging, especially in larger organizations. Management support is crucial in this regard; top management must be committed to the change and clearly communicate why it is being implemented, the current status of the change, and the benefits it will bring.

Strategic readiness is also at the medium level. The ERP change should align with the organization's overall strategy; conflicts in strategy and actions confuse employees. A strong commitment from the board and top management is crucial to support the change project. This commitment and support should be communicated to the employees.

It's also important to note that these factors can't be considered completely separate from one another. These factors overlap and may interact with one another. Resource and IT readiness, as well as cognitive and partnership readiness, appear to be interconnected. Having sufficient resources, especially human capital, is essential for developing IT

readiness. Cognitive skills will enhance communication and the ability to ask precise questions, and this is crucial for leveraging partnerships. Overall, all the factors are important, and the higher the readiness level is, the easier the ERP implementation is, and the benefits can be utilized more effectively.

6.2 ERP change creating IS business value

Successful adaptation and use of IS are key to getting business value from it. Understanding this relationship helps to explain how proper adaptation and usage directly contribute to business value.

All the findings support that ERP changes create business value for organizations. As noted earlier in the study, evaluating business value is challenging because it is difficult to assess the interrelated effects of the benefits. Many of the achieved benefits appear to impact multiple business value areas, and some seem to be enablers of achieving additional benefits.

Organizational value is influenced by several benefits that organizations achieve through ERP system change, including enhanced efficiency and visibility in production, improved data transfer and accuracy, consolidated systems, practices, and decision-making processes, stronger internal and external relationships, and the development of individual skills. These findings are supported by earlier studies that recognized improvements in coordination (Alsene, 2007) following the ERP change, as well as enhanced supply chain and customer management (Su, Yang 2010), and reliable on-time decision-making (Spathis, Constantinides 2004).

Customer value was enhanced through improved efficiency and visibility in production, better data transfer and accuracy, consolidated systems and practices, better decision-making, enhanced individual skills, and improved customer service. In previous studies, similar results have been reported. Gupta, Priuadarshini, Massoud, and Agrawal (2004) also found out that quality checks were improving an organization's business. Continuous learning leads to continuous improvements (Cottleer, Bendoly 2006) and the efficient use of information, leading to better business value (Bendoly, Rosenzweig, Stratman 2009).

Financial value was enhanced through improved efficiency and visibility in production, enhanced data transfer and accuracy, consolidated systems, practices, and decision-making processes, strengthened internal and external relationships, and improved customer service. The improved quality of reports and monitoring has been recognized as a contributing factor in earlier studies as well (Ram, Corkindale, Wu, 2013).

Enhanced efficiency and visibility contribute value at all levels of business value creation, as well as in data transfer and accuracy. In addition, consolidated systems, practices, and decision-making, along with stronger internal and external relationships, are creating value at organizational, customer, and financial levels. One aspect impacts multiple levels of business value creation as its benefits can be found from various perspectives. For example, better visibility facilitates planning and decision-making in organizational value, improves response times to customers, which in turn leads to enhanced customer value, and helps optimize profitable production.

Individual skills contribute to organizational and customer value but not directly to financial value. Individual skills indirectly affect financial value through their impact on organizational and customer value. As it was noted earlier, organizational value and customer value enable the creation of financial value. Customer service directly enhances both customer and financial value. However, creating organizational value will enable better customer service, which in turn will indirectly impact financial value. All the business values appear to be interconnected, enabling and affecting one another across all value levels.

6.3 IS value maximization

There are multiple factors that organizations must consider when seeking to gain a full advantage from an ERP change in an industrial organization. To maximize ERP business value, an organization must focus on how to gain organizational, customer, and financial value from the ERP system. The organization must have a high readiness level to implement ERP change, as it is the foundation for reaping the benefits of the change.

The high IS readiness level ensures that the organization has the possibility to gain advantages from ERP change. Having sufficient financial, technological, and human capital resources ensures the best possible situation for starting an ERP change project. The lack of

any of these factors can cause challenges to the change process. Financially, ERP projects require a significant investment to acquire technological solutions that support new ERP systems or to hire skilled employees to support the project if these resources are not already within the organization. Human capital is a critical component of the change, as it will not occur without people dedicating their working hours to it.

In IT readiness, if an organization lacks sufficient resources, additional personnel should be hired or acquired from a service provider to maximize the benefits of the change. It was noted that project participants should have sufficient knowledge of the ERP needs and technology, enabling them to demand the necessary services and actions to achieve optimal benefits. As industrial organizations are not experts in data or technology, support for IT readiness can be acquired from outside the organization.

Cognitive readiness deserves extra attention from organizations, as it is believed that challenges exist at this level. Industrial organizations often employ change-resistant individuals; it is common for them to have long careers, and the average age of employees is not typically the generation accustomed to change, especially when considering the adoption of digital systems. This requires perseverance and extensive training for employees. The resources to keep the training sessions are needed as it is noted that single training is not enough; there should be a longer period when people can get help with ease and continuously.

Industrial organizations are ready to leverage their partnerships and understand their necessity in the ERP system change. However, it's essential to ensure that the organization has knowledge about the ERP change and its requirements so that communication between the organization and its partners can be efficient. If there is no common understanding between the participants, getting leverage is challenging. Organizations can hire consultants to help if it appears that there is insufficient understanding within the organization to maximize the benefits of the partnerships. The length of the partnerships was important. The partnerships should be chosen by stable operators who can provide assistance as long as it's needed and trust between the organization and partner has time to establish a confidential relationship.

To reach a higher IS valance, organizations should generate positive attitudes and team spirit around the change. As noted, individual trust in success is a critical factor in IS valance;

therefore, support from top management, sufficient training opportunities, and open communication are necessary. Strong individuals with positive attitudes toward change and the ability to see the benefits of change will help the organization identify potential benefits in both the present and the future and put them into practice. Organizations should pay attention to the teams selected to be key persons in the project, as leader attitudes significantly impact the spirit of all employees.

Creating a culture that is open to changes and supports employees is challenging, especially in larger organizations. Management support is crucial in this regard, top management must be committed to the change and communicate. To increase awareness and foster a positive culture, there must be continuous communication about why the ERP system change is necessary, how the change process will be implemented, and its benefits. If an organization fails to support the change from top management to supervisors and employees and doesn't take actions that support the change, people won't trust the successful implementation. Cultural readiness for ERP change can also be enhanced by creating more opportunities for participation and fostering an atmosphere that encourages the sharing of ideas about best practices.

In strategic readiness, it's essential that the need for ERP change is clearly communicated and aligns with the organization's overall strategy. Missing the frames to the ERP change will cause confusion and uncertainty among employees. To clarify the strategy for ERP change and enhance communication between top management and employees, a senior member of top management can be designated as a mentor for the project, serving as a liaison between management and employees. Figure 5 gathers the practices that ensure the ERP system creates IS value for the organization

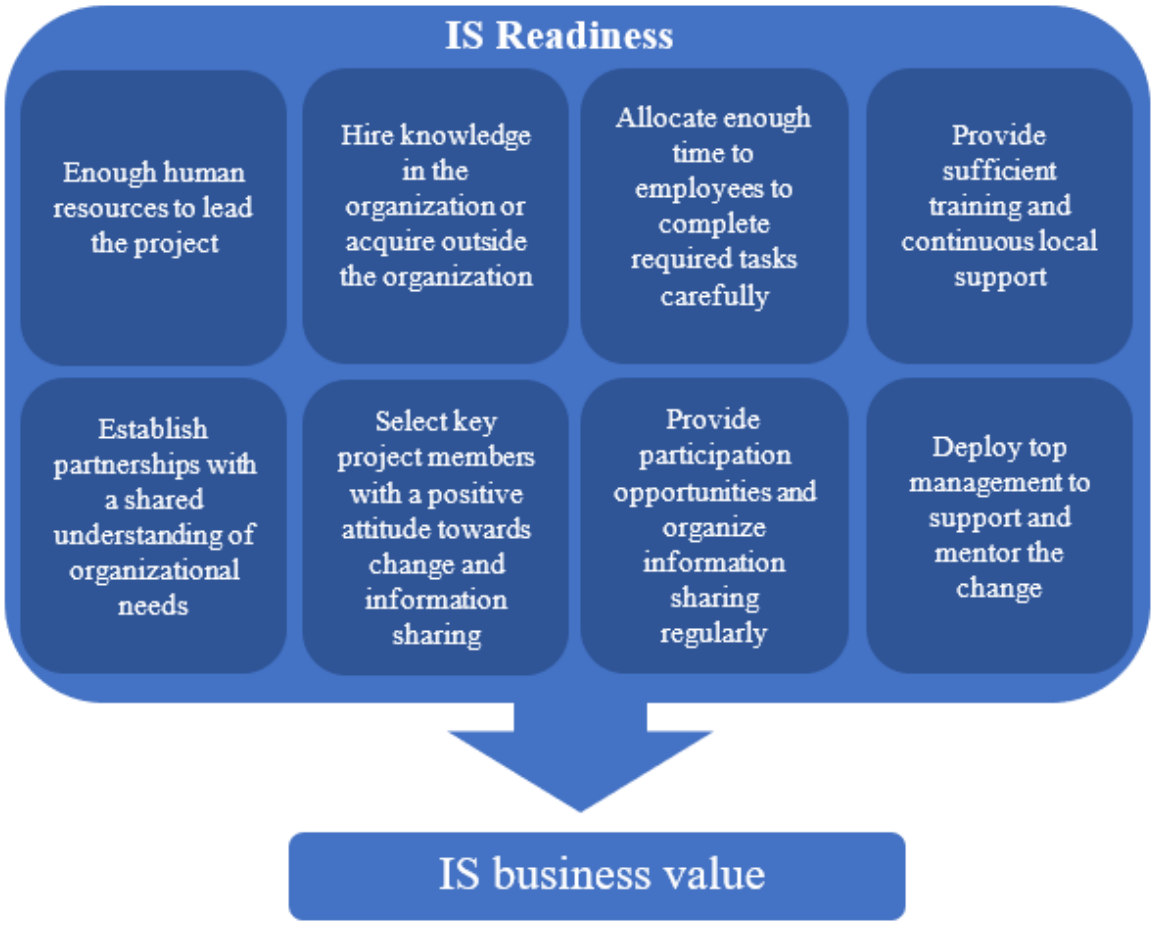

Figure 5. Practices creating IS business value

7 Conclusions

The research identified the key factors that influence the successful implementation of ERP systems in industrial organizations. It provided insight into how these systems can create significant business value when properly integrated and utilized. The research also provided recommendations for industrial organizations to maximize the value of their ERP systems.

The study examined organizational readiness for ERP implementation in industrial organizations, focusing on six key themes: resource readiness, IT readiness, cognitive readiness, partnership readiness, cultural readiness, and strategic readiness. These factors significantly influence the effectiveness of the ERP system and the overall business value in an industrial organization. Resource readiness was strong in industrial organizations, requiring financial support, skilled employees, and updated technological infrastructure. IT readiness was the lowest factor, requiring effective data quality management and the ability to process large amounts of data efficiently. Cognitive readiness was average in industrial organizations, and it requires training employees and effective change management. Partnership readiness was strong, and clear communication and understanding were essential between ERP vendors and other partners. IS valance is average, and positive attitudes and team spirit must be supported from the top to all levels. Cultural readiness is moderate in industrial organizations, and it requires management support to foster a culture that is open to change. Additionally, strategic readiness was moderate, and ERP changes were necessary to align with the organization's overall strategy, requiring a strong commitment from top management. The findings on the importance of IS readiness and the factors that affect the ERP change process are similar to those from previous research.

The successful adaptation and utilization of ERP systems are crucial for enhancing a business's value. Research conducted prior to the study supports the findings about the benefits that industrial organizations may gain from ERP changes. Enhanced efficiency and visibility will impact production, customer satisfaction, and profitability. ERP change can improve decision-making, bring benefits from common systems and practices, and enhance internal and external relationships. This study highlighted the importance of individual skills that are learned during the ERP change and the value they bring to industrial organizations. This perspective was not previously reported in earlier research. To maximize the value of

ERP change benefits, industrial organizations should allocate sufficient resources to ERP change projects. Providing enough employees and time to change, and ensuring their knowledge, will increase IS value creation in industrial organizations. Creating opportunities for employees to participate in change, training them, and sharing information about the change are essential. This needs strong commitment from top management and the project leaders. An ERP system requires support from both management and employees to maximize business value.

> "To get modern ERP systems functioning well is demanding a lot from everyone. There needs to be a lot of interest and want to learn so it can function efficiently"

Findings on readiness and actions that enhance IS business value are primarily gathered around the people involved in the ERP change. This highlights the importance of industrial organizations paying more attention to their employees during ERP change projects. Especially when it's recognized that employees in industrial organizations are not the most adaptable ones when it comes to changes. Research has shown that ERP systems are not effective on their own; they require people to support them. People working with ERP create a competitive advantage. One sentence in interviews summarized the importance of each employee:

> " The ERP system is as good as its weakest user"

Based on the case analysis, it can be concluded that implementing an ERP system can bring numerous benefits to the organization. Enhancement can be found in strategy, flexibility, and agility, as well as in strengthening partnerships, skills, and capabilities. Customers benefit from better product quality, operational efficiency, and faster response times. These benefits will enhance profitability and drive revenue growth within the organization. To improve the IS business value of the ERP case, the organization should prioritize human resources, develop an automated process for data handling and quality assurance, and implement efficient change management and communication regarding the ERP change project.

7.1 Practical implications

From the IS readiness point of view, the case organization has a financially good base to start an ERP change project. The parental organization can support the acquired organization in the change. Technologically, the case organization is in a good position, as it has a well-maintained technological infrastructure within the organization, and the parent organization also provides capability support in this area. The parental organization has a better situation with human capital than the case organization in terms of completing all the required processes. This should be noted when evaluating the resource readiness stage. The case organization has human resources barely to survive the daily business, but not enough to implement ERP change efficiently. To enhance the situation, the organization's allocation of human resources should be investigated, and whether there is a need to revise the processes or recruit new employees to distribute the workload.

The case organization has been utilizing a modern ERP system, which has enabled the collection of a substantial amount of data and information. Some of the data must be transformed to meet the needs of the new ERP, as is the case in most instances. The parental organization has been able to support the identification of necessary data for a new ERP system, ensuring the quality of the data. To enhance IT readiness, processes should be created to facilitate, review, and modify the data. Automated processing would significantly help employees implement the necessary changes to data, and improved data quality will reduce problems in daily operations.

The case organization is facing the same problems in cognitive readiness as other industrial companies. The case organization has a high percentage of long-term employees who may exhibit resistance to adapting to new systems. Employees have the skills to adapt to new technologies and processes; however, as the organization has undergone multiple acquisitions and significant changes, they are growing tired of the constant unstable situations and changes. Cognitive readiness has its strengths and weaknesses within the organization; there is the capability to learn, but the resources for learning are limited. Effective change management should be implemented in top and middle management to ensure that employees receive adequate support during the ERP implementation.

From the perspective of partnership readiness, the case organization has been used to collaborate with other partners related to ERP systems. Cooperation with the current ERP

vendor has been ongoing, and modifications have been made with their assistance. The parental company has been supporting the ERP change in the case organization, and collaboration will continue. As it's recognized that there are many skilled employees within the organization who can lead ERP change projects, there has been no need for consultants outside the organization. To enhance partnership readiness, the case organization should consider engaging a consultant outside the project; an objective opinion and review of the situation could reveal both challenges and strengths within the project.

The case organization's ERP change will impact both white-collar and blue-collar employees. As seen in other industrial organizations, it's assumed that white-collar employees have a better ability to adapt to ERP changes than blue-collar employees within the organization. Also, it depends on the individual's personal characteristics and how they are reacting to the change. Employee participation in the project has not been at a high level, resulting in a personal commitment to the ERP change project that is not as strong as it could be. The case organization's IS valance level is not reaching the best level, but people are trying to approach the change in a positive manner. Even though the ERP project is mandatory, how it's communicated about the ERP project and how employees are truly involved in the project should be considered at every level in the case organization.

The parental organization has stricter processes and practices than those the case organization is accustomed to, and this is reflected in the culture. Centralized decision-making and slow reactions to shared ideas are decreasing cultural readiness in the case organization. The parental organization promotes values, norms, and practices that should foster an innovative and open culture for change; however, in practice, these are challenging to implement within the case organization, as there is no genuinely open culture for change, and the parental organization struggles to implement them due to its large size. The case organization is accustomed to seeing the challenges in change first, rather than the opportunities it presents. Changes should be prepared well and led according to a pre-planned strategy while considering all participants and sharing information openly. Cultural readiness is a weakness, as the case or parental organization lacks the capability to create an open culture toward new innovations, especially in the context of an ERP change.

Strategic readiness can be recognized as another challenge spot for the case organization. The ERP change has been aligned with the strategy at the top management level; however, implementing the strategy at the ground level is challenging. Strategy and decisions made in

the parent company feel distant from the case organization and are not always fully understood. Communication and information sharing about the ERP project and its targets are minimal, and the case organization employees feel that they are not being kept informed enough. To enhance strategy readiness, actions should be taken to make targets visible from top to bottom. The case organization could provide regular information to employees, and top management could step down to ground level to support the ERP change.

To summarize, there are numerous practical implications that industrial organizations can implement to achieve maximum information system business value in ERP change projects. Organizations should prioritize their attention to employees, managers, and top management. Employees should have opportunities to participate in ERP changes, and regular information sharing about the project and its progress should be provided. This way, employees will be committed to a change. Then, there should be sufficient resources to manage tasks related to a project and enough time to complete them carefully; successful changes require a significant amount of working hours. Besides commitment and time, organizations should ensure that they have the necessary knowledge and skills to succeed in the ERP project by training existing employees, hiring new staff, or engaging consultants to guide them through the change. It's also suggested that organizations provide sufficient training to enable employees to learn the ERP system and offer continuous local support during and after the implementation. This way, sorting the issues is more straightforward when help is close to the employees.

Managers and top management must ensure that a project management team and a project leader are in place. These key persons should be selected so that they can lead the project with a positive attitude and strong skills in sharing information. Managers serve as the link between employees and top management to ensure that information on ERP changes is communicated effectively between the parties. Top management should ensure successful ERP implementation by supporting and mentoring organization members in ERP changes; this way, the strategy will be shared with the whole organization

7.2 Limitations of the study

This study has its limitations. Researchers always examine the topic from their own perspective, which can influence how the data is understood or the conclusions drawn. The

primary limitation is the interviewees. They were answering the interview questions from the perspective of their job positions, and it cannot be assumed that they share the same opinions as all the employees of the organization. Additionally, the number of interviewees was relatively small, resulting in a sample size that is not very large. However, the sample size is not the primary concern in qualitative research, where the goal is to gain a deeper understanding rather than make generalizations.

As the individual is seen as an essential part of successful ERP implementation and a creator of business value through ERP changes, it would be a reasonable topic to research further. Considering the resistance to change in industrial organizations, it would be beneficial to investigate how employees in these organizations can be motivated during ERP implementations. The second research topic could delve a bit deeper and investigate whether the benefits of ERP changes differ depending on whether the ERP change is driven by the organization's own needs or by organizational acquisitions. That aspect has not been considered in this study.

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Appendix 1. Interview question template

1. Background questions

a. Interviewee's job title:

b. Industry of the organization:

c. Size of the organization / Revenue:

d. When was the ERP change implemented?

2. IS readiness factors

How would you describe your organization's IS readiness based on the factors mentioned below? (During the ERP change) Please rate your readiness level in every factor (low, medium, high)

i. Resource readiness

- Organization's ability to support digital innovations and change. In this context resources are financial, human capital, and technological infrastructure.

ii. IT readiness

- Data is easily accessible, high-quality, and easy to process.

iii. Cognitive readiness

- Employees knowledge, skills and adaptability and organization's environment support organizational learning.

iv. Partnership readiness

- Stakeholders like IT vendors, consultants and customers involved innovation projects and collaboration.

v. IS valance

- Positivity of members towards digital innovations. Attitude, motivation, empowerment, commitment, and employee participation.

vi. Cultural readiness

- Organizational culture that promotes innovations, decentralized decision-making, and low-risk aversion. Open and positive culture towards new digital systems.

vii. Strategic readiness

- Managerial action that an organization participates to success in digital innovation. Aims for the entire organization to have a unified view of the information systems' needs and to ensure that the systems align with the organization's business needs.

3. Organizational value

a. Strategic planning / informed decision-making

i. Has the ERP change improved planning or decision-making? If yes, please share examples.

ii. How long did it take to recognize these improvements?

iii. Has any specific factor influenced the success in this area?

b. Flexibility/agility

i. Has flexibility and agility increased after the ERP change? Please share examples.

ii. In what timeline has it been possible to recognize these improvements?

iii. Has any specific factor influenced the success in this area?

c. Strategic alliances/supplier relationships

i. Has the new ERP system changed relationships with suppliers or other strategic alliances?

ii. How long did it take to see changes in these relationships?

iii. Has any specific factor influenced the success in this area?

d. Enhanced skill and capabilities

i. Has new ERP led to new or enhanced skills and capabilities?

ii. In what timeline has it been possible to recognize these improvements?

iii. Has any specific factor influenced the success in this area?

4. Customer value

a. Product Leadership

i. Has the new ERP system helped to achieve product leadership? If so, share examples of how.

ii. How long did it take to recognize these achievements?

b. Operational exellence

i. Has the new ERP system brought benefits to operational functions? If yes, please provide examples.

c. Customer intimacy

i. Has the new ERP improved relationships with customers? What improvements have been observed?

ii. How long did it take to recognize these improvements?

5. Financial Value

a. Profitability

i. Has the new ERP system contributed to increased profitability? If so, in what way (internal vs. external profitability)

ii. In what timeline increased profitability was recognized?

b. Revenue growth

i. Has the ERP system directly contributed to revenue growth? If so, how?

c. Return on assets (can be answered if the interviewee has knowledge of the topic)

i. Has the new ERP been the reason for the increased return of assets? If yes, please explain how.

Appendix 2. Summary of the responding organizations and their answers

Organization A

Industry	Metal subcontracting	
Revenue €	7 million	
Num. of employees	40	
ERP change implemented	2020	
Interviewees job description	Production Manager responsible of ERP system change, Production Manager supporting ERP implementation and Key Accountant Manager from the sales side	
IS readiness	**Level**	
Resource readiness	Low	
IT readiness	Low	
Cognitive readiness	Medium	
Partnership readiness	Medium	
IS valance	Medium	
Cultural readiness	Medium	
Strategic readiness	Low	
Organizational value	**Improvements**	**Time taken to get improvments**
Strategic planning / informed decision-making	Achieved	1 year
Flexibility/agility	Achieved	2 years
Strategic alliances/supplier relationships	Achieved	1 year
Enhanced skill and capabilities	Not seen, depends organization	
Customer value		
Product Leadership	Achieved	2 years
Operational exellence	Achieved	2 years
Customer intimacy	Achieved	1 year
Financial value		
Profitability	Achieved	in the long run
Revenue growth	Not seen, depends organization	
Return on assets	Not seen, depends organization	

Organization B

Industry	Valves	
Revenue €	330 million	
Num. of employees	841	
ERP change implemented	2018 / 2023	
Interviewees job description	Business solutions manager. Operating between IT and business during projects and developing	
IS readiness	**Level**	
Resource readiness	High	
IT readiness	Medium	
Cognitive readiness	Medium	
Partnership readiness	High	
IS valance	Medium	
Cultural readiness	Low	
Strategic readiness	Medium	
Organizational value	**Improvements**	**Time taken to get improvments**
Strategic planning / informed decision-making	Achieved	2 years
Flexibility/agility	Achieved	2 years
Strategic alliances/supplier relationships	Not seen, depends organization	
Enhanced skill and capabilities	Achieved	2 years
Customer value		
Product Leadership	Achieved	2 years
Operational exellence	Achieved	2 years
Customer intimacy	Achieved	1 year
Financial value		
Profitability	Achieved	in the long run
Revenue growth	Not seen, depends organization	
Return on assets	No knowledge to topic	

Organization C

Industry	Electric Powertrains	
Revenue €	20 million	
Num. of employees	90	
ERP change implemented	2019	
Interviewees job description	Sourcing Project Manager, super user in ERP and PLM system and knowledge expert	
IS readiness	**Level**	
Resource readiness	High	
IT readiness	Low	
Cognitive readiness	Medium	
Partnership readiness	High	
IS valance	High	
Cultural readiness	High	
Strategic readiness	High	
Organizational value	**Improvements**	**Time taken to get improvments**
Strategic planning / informed decision-making	Achieved	1 year
Flexibility/agility	Not seen, depends organization	6 months
Strategic alliances/supplier relationships	Achieved	1 year
Enhanced skill and capabilities	Achieved	2 years
Customer value		
Product Leadership	Achieved	Immediately
Operational exellence	Achieved	6 months
Customer intimacy	Achieved	Immediately
Financial value		
Profitability	Achieved	Immediately
Revenue growth	Achieved	6 months
Return on assets	Achieved	6 months

Organization D

Industry	Welding subcontracting	
Revenue €	8 million	
Num. of employees	40	
ERP change implemented	2020	
Interviewees job description	Development engineer responsible of ERP system change and other projects	
IS readiness	**Level**	
Resource readiness	High	
IT readiness	Medium	
Cognitive readiness	High	
Partnership readiness	High	
IS valance	Medium	
Cultural readiness	High	
Strategic readiness	High	
Organizational value	**Improvements**	**Time taken to get improvments**
Strategic planning / informed decision-making	Achieved	1 year
Flexibility/agility	Achieved	1 year
Strategic alliances/supplier relationships	Not seen, depends organization	
Enhanced skill and capabilities	Achieved	Immediately
Customer value		
Product Leadership	Achieved	1 year
Operational exellence	Achieved	1 year
Customer intimacy	Achieved	1 year
Financial value		
Profitability	Achieved	1 year
Revenue growth	Achieved	1 year
Return on assets	Achieved	1 year

Organization E

Industry	Wholesaler	
Revenue €	4 million	
Num. of employees	5	
ERP change implemented	2021	
Interviewees job description	Sales Assistant, Order handling, invoicing, logistics, preliminary accounting	
IS readiness	**Level**	
Resource readiness	High	
IT readiness	Medium	
Cognitive readiness	High	
Partnership readiness	Medium	
IS valance	Low	
Cultural readiness	High	
Strategic readiness	Medium	
Organizational value	**Improvements**	**Time taken to get improvments**
Strategic planning / informed decision-making	Achieved	1 year
Flexibility/agility	Achieved	1 year
Strategic alliances/supplier relationships	Not seen, depends organization	
Enhanced skill and capabilities	Not seen, depends organization	
Customer value		
Product Leadership	Not seen, depends organization	
Operational exellence	Not seen, depends organization	
Customer intimacy	Achieved	1 year
Financial value		
Profitability	Not seen, depends organization	
Revenue growth	No knowledge to topic	
Return on assets	No knowledge to topic	

Organization F

Industry	Insulation materials and insulators	
Revenue €	84 million	
Num. of employees	2000	
ERP change implemented	2019	
Interviewees job description	IT Development Manager, ERP system change and MES systems	
IS readiness	**Level**	
Resource readiness	High	
IT readiness	High	
Cognitive readiness	Medium	
Partnership readiness	High	
IS valance	High	
Cultural readiness	High	
Strategic readiness	High	
Organizational value	**Improvements**	**Time taken to get improvments**
Strategic planning / informed decision-making	Not seen, depends organization	
Flexibility/agility	Not seen, depends organization	
Strategic alliances/supplier relationships	Achieved	Immediately
Enhanced skill and capabilities	Achieved	in the long run
Customer value		
Product Leadership	Not seen, depends organization	
Operational exellence	Not seen, depends organization	
Customer intimacy	No knowledge to topic	
Financial value		
Profitability	Achieved	Immediately
Revenue growth	No knowledge to topic	
Return on assets	No knowledge to topic	