ES Implementation as a Context for Digital Innovation:

How SAP Partners Organize for Digital Innovation

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Abstract

Digital innovation has been subject to significant attention in information systems (IS) research, focusing on the transformative effect of technology adoption in organizational contexts. Generic enterprise software (ES) is often found at the center of organizations' efforts towards leveraging the promised benefits offered by information technology (IT) in an environment where business needs rapidly evolve. Existing IS research on ES implementation portrays a context that appears infertile for digital innovation, which requires flexibility to combine and recombine software features to enable change and create novel value. Meanwhile, both ES vendors and partner organizations who specialize in implementation advertise the solutions as drivers of digital innovation. A relevant gap thus remains in exploring ES implementation as a context for digital innovation.

This thesis extends existing knowledge on ES implementation as a context for digital innovation by addressing the question: *How do partners organize ES implementation projects for digital innovation?* Based on a one and a half year long case study, this thesis explores the design and innovation practices of seven prominent SAP partners operating in Norway. Based on the empirical findings, I develop a conceptualization of how digital innovation takes place during ES implementation through what I coin a *two-sided monitoring process* of technical possibilities afforded by the generic ES as a design infrastructure, and organizational needs. Furthermore, four factors appear as consistently important through analyzing what partners consider as enabling digital innovation during ES implementation. These are (1) cultivating an individual design infrastructure, (2) conducting two-sided monitoring, (3) organizing projects based on high-level business goals, and (4) identifying a user organizations' particularities for strategic advantage. The conceptualization and the four factors contribute to research and practice concerning ES implementation as a context for digital innovation.

Keywords: Generic enterprise software, ES implementation, digital innovation, design infrastructure

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1 Introduction

This thesis explores generic enterprise software (ES) implementation as a context for digital innovation. Digital innovation has been subject to significant attention in information systems (IS) research (Legner et al., 2017; Nambisan, 2013). It can be defined as the process, and the result, of combining and recombining digital components that enable change and create novel value (Henfridsson et al., 2018; Yoo et al., 2012). An important premise for the potential for digital innovation is consequently flexible technology that can be shaped and extended according to local needs (Fichman et al., 2014; Nambisan et al., 2017). Many organizations are investing extensive efforts in leveraging the benefits offered by information technology (IT) to support their evolving business needs. ES is commonly found at the center of such efforts, promising organization-wide integration and streamlining of data (Berente et al., 2019). ES refers to commercial software solutions intended to support business processes and workflow across a diverse range of organizational contexts and industries (Elragal et al., 2020). These solutions are commonly implemented in organizations in order to increase performance and efficiency (Lokuge & Sedera, 2018). ES is predominantly designed by an ecosystem encompassing a vendor and numerous associated partners, some of which specialize in implementation (Wareham et al., 2014). Major players within this domain, such as SAP and Salesforce, frequently advertise their ES solutions as drivers of digital innovation that enable intelligent enterprises (SAP, n.d; Salesforce, n.d).

Yet, the perspectives offered by IS literature portrays ES implementation as an implausible context for digital innovation. The dominant perspective focuses on the seemingly persistent challenge of accommodating the heterogeneous needs of user organizations (Davenport, 1998; Kallinikos, 2004; Mousavidin & Silva, 2017; Strong & Volkoff, 2010). As the characterizing notion of 'generic' indicates, ES is designed as solutions transcending their place of production, by being adopted across use contexts and business segments (Koch, 2007; Pollock et al., 2007; Sommerville et al., 2012). In these studies, ES is characterized as standardized packaged software posing its rigid logic of work processes onto the adopting user organization (Kallinikos, 2004; Strong & Volkoff, 2010). ES thus appears inflexible with limited potential for combination and recombination, portraying ES implementation unfit to foster digital

innovation. The line of investigation in prior studies emphasizes social dynamics and organizational characteristics as enabling factors for organizational innovation (Badewi et al., 2020; Kharabe & Lyytinen, 2012). Here, ES appears to be an enabler for intentional organizational change in the surrounding socio-technical structures, by identifying social criteria of successful adoption (Berente et al., 2016; Sykes & Venkatesh, 2017). However, limited attention has been directed to technology design and the potential for digital innovation during ES implementation (Berente et al., 2019).

An emerging stream of literature is arguing the potential for digital innovation during ES implementation offered by platform ecosystems (Lokuge & Sedera, 2018; Sedera et al., 2016; Staub et al., 2021). The rise of such ecosystems results from the necessity of providing user organizations with highly flexible, complex, and industry-specific solutions that can support their heterogeneous needs (Staub et al., 2021; Wareham et al., 2014). These efforts afford a collective breeding ground for innovation (Ceccagnoli et al., 2012; Hein et al., 2020; Yoo et al., 2012), facilitated by vendors "opening up" their solutions and pursuing platform strategies (Farhoomand, 2007; Foerderer et al., 2019). The value-creation in ES ecosystems enable partners to cater to particular practices and needs during ES implementation by providing flexibility and configurable software features (Li & Nielsen, 2019b). Partners' ability to leverage the software features provided by the larger ecosystem in response to emergent user needs is thereby imperative for the capacity of ES to foster digital innovation. Yet, partners' efforts to exploit software features to this end is still understudied (Jæger et al., 2020). A relevant gap thus remains in understanding ES implementation as a context for digital innovation (Berente et al., 2019).

1.1 Research Question

This thesis extends existing knowledge on ES implementation as a context for digital innovation by addressing the following research question:

How do partners organize ES implementation projects for digital innovation?

ES implementation is a complex endeavor for any user organization to face on their own. Utilizing experienced partners to take on this task is consequently considered imperative for successful implementation (Jæger et al., 2020). I have examined the research question by conducting an interpretive case study (Myers, 1997; Walsham, 2006) where informants from

seven prominent SAP partners operating in Norway have been interviewed on their design and innovation practices. These partners have extensive experience with implementation of SAP and other ES for user organizations.

This thesis offers several contributions. First, from my empirical findings I develop a conceptualization of how digital innovation takes place during ES implementation through what I coin a *two-sided monitoring process* of technical possibilities afforded by the generic ES as a design infrastructure, and organizational needs. Second, through analyzing what partners consider as enabling digital innovation during ES implementation, I have identified four factors that appear as consistently important across partners. These are (1) cultivating an individual design infrastructure, (2) conducting two-sided monitoring, (3) organizing projects based on high-level business goals, and (4) identifying a user organizations' particularities for strategic advantage. By identifying these factors, I seek to contribute to the body of knowledge on ES implementation as a context for digital innovation (Badewi et al., 2020; Berente et al., 2019; Elragal et al., 2020; Kharabe & Lyytinen, 2012; Lokuge & Sedera, 2018; Sarker et al., 2012; Sedera et al., 2016), by offering insight into an understudied context. The analysis of the empirical findings also suggests practical implications for partners and vendors engaged in ES design, and for user organizations seeking to collaborate with a partner. Finally, based on the contributions of this thesis, I propose four avenues for further research.

1. 2 Chapter Summary

This thesis is organized in the following manner:

Chapter 2: Related Literature

The second chapter describes the concept of digital innovation before providing an account of three streams of related literature which views the potential for ES to foster digital innovation during implementation in user organizations in different manners.

Chapter 3: Theoretical lens

The third chapter describes a theoretical framework that has been applied to the empirical findings. The aim was to gain an understanding of the roles, activities, and software features that go into ensuring the potential for digital innovation during ES implementation.

Chapter 4: Research Approach

The fourth chapter describes the case background, the origin of the research problem, and the research question addressed in this thesis. It also gives an account of the philosophical assumptions, methodology, and methods for data collection, before describing the process of how I analyzed the empirical data.

Chapter 5: Case analysis

The fifth chapter provides an account of the empirical findings gathered throughout this research project. I first present typical ES implementation projects, before describing how partners organize ES implementation projects with a goal of facilitating digital innovation in greater detail. Finally, I identify and present four factors highlighted as important across partners when organizing ES implementation for digital innovation.

Chapter 6: Discussion and Contribution

In the sixth chapter, I discuss the empirical findings and how they relate to existing literature. I further argue how the four factors identified contribute to theory and literature, before offering implications for practice. Finally, based on the contributions of the thesis, I provide four avenues for further research.

Chapter 7: Conclusion and limitations

The final, and seventh chapter, offers an account of the limitations and a short summary of the thesis with some concluding remarks.

2 Related Literature

This thesis aims to explore ES implementation as a context for digital innovation by identifying how partners organize implementation projects for this purpose. The aim of this chapter is to examine existing perspectives on ES implementation as a context for digital innovation. To this end, I account for three streams of IS literature that have illustrated ES implementation from various perspectives, roles, contexts, and phenomena. I begin by defining the concept of digital innovation. Then, I account for three relevant perspectives on how ES implementation as a context for digital innovation is portrayed: The first perspective focuses on the difficulties of catering to particular needs, and portray ES implementation as an inflexible and hence implausible context for digital innovation. The second perspective views ES as a driver of organizational innovation, as opposed to digital innovation, with little attention on the role of technology design. The third and final perspective offers potential for digital innovation by enabling partners through ES platform ecosystems. However, limited attention is paid to ES implementation. Finally, I present an account of what I consider to be the gap that this thesis attempts to address.

2.1 Digital innovation

IS research has examined digital innovation from multiple perspectives (Hund et al., 2021), largely by studying how organizational, societal, and individual contexts have transformed in line with technology adoption and use (Bharadwaj et al., 2013; Henfridsson et al., 2018; Legner et al., 2017; Nambisan, 2013; Øvrelid & Kempton, 2019). The phenomenon of digital innovation is used throughout this thesis to pragmatically assess the practices and activities potentially enabling such results during ES implementation: I define the phenomenon of digital innovation as the process, as well as the result, of combining and recombining digital components that enable change and create novel value in user organizations (Henfridsson et al., 2018; Yoo et al., 2012).

Digital innovation has radically changed the way services and products are created and has enabled new ways of organizing and creating value (Nambisan et al., 2017). Maintaining a strategic competitiveness in an increasingly digital environment requires user organizations to

fundamentally rethink how their businesses are organized (Bharadwaj et al., 2013; Hund et al., 2021). Such efforts can encompass a variety of outcomes: products, services, digital platforms, business models, work processes, or customer experiences (Nambisan et al., 2017). The process of enabling digital innovation in user organizations can encompass various strategies. These strategies include the more traditional sense of enhancing physical product functionality with software capabilities (Fichman et al., 2014; Yoo et al., 2010), the use of pervasive technology to create novel socio-technical entities (Wang, 2021; Yoo et al., 2012) that are enabled by the affordances of generative technology, such as digital platforms and infrastructures (Henfridsson & Bygstad, 2013), as well as design and implementation of software solutions with concomitant organizational change (Gebre-Mariam & Bygstad, 2019).

The qualifying characteristics of what constitutes a digital innovation is that it is embodied in, or enabled by IT, perceived as new, and poses significant change for adopters (Fichman et al., 2014). This emphasizes that the outcome can be both digital and social, such as enabling organizational change by introducing new IT capabilities to an organization (Markus, 2004). The prospects for combining and recombining digital components are afforded by the characteristics of digital components, namely that they are malleable and editable (Yoo et al., 2010). Accordingly, the scope, features, and value of digital components can continue to evolve (Nambisan et al., 2017), by building new capabilities after the initial design (Fichman et al., 2014). Hence, digital components include flexibility to continue to enable value as its initially designated purpose evolves. They do so by their ability to be combined and recombined with social and organizational problems (Nambisan et al., 2017). Digital innovation thus represents a socio-technical phenomenon (Msiska & Nielsen, 2018), enabled by the affordances of generative technologies and social structures.

2.2 First perspective: The challenges of ES implementation

The first perspective of ES implementation as a context for digital innovation portrays the relationship between ES and innovation as restrictive (Davenport, 1998). The salient role of ES in organizations has naturally gained attention from IS research where ES implementation has remained a disputed topic (Jæger et al., 2020; Williams & Pollock, 2009). In contrast to the aim when developing bespoke software, ES is designed to serve a diverse set of needs across user organizations (Koch, 2007; Pollock et al., 2007; Sommerville et al., 2012). The general perception of the generic nature of ES indicates that the software is fixed and thereby offers an

inherently rigid logic onto the adopting user organization (Berente et al., 2016; Davenport, 1998; Strong & Volkoff, 2010; Xu & Brinkkemper, 2007). These characteristics have repeatedly been illustrated by several studies, emphasizing the undesirable repercussions on user organizations' local processes and structures (Kallinikos, 2004; Mousavidin & Silva, 2017; Strong & Volkoff, 2010). While IT solutions' contextual relevance is argued imperative for successful IT implementation (Baxter & Sommerville, 2011), ES appears inflexible for fulfilling such criteria. Adoption has rather been discussed as a matter of changing the organizational practices according to the generic software (Berente et al., 2016). Questions have consequently been raised regarding the ethics of persuading user organizations to adapt to a standardized "best practice" workflow inherent in generic software solutions (Wagner et al., 2006). On the other hand, the financial benefits of purchasing generic solutions and making minimal software changes with regard to maintenance work have also been emphasized (Farhoomand, 2007; Light, 2001).

In line with this general critical tendency in research concerning ES' inflexibility, several studies have been conducted to examine the social and organizational impact of implementation (Sia & Soh, 2007; Soh et al., 2000; Williams & Pollock, 2009). This portrayal has sustained over time (Soh et al., 2000; Vos & Boonsta, 2022). The attention in these studies is consequently directed toward events that occur after implementation (Sykes & Venkatesh, 2017; Williams & Pollock, 2009), predominantly from the user organizations' perspective (Berente et al., 2016; Strong & Volkoff, 2010). Here, ES is described as unable to accommodate rapid changes based on emerging technological and organizational needs. The software appears fixed and inflexible with limited potential for combination and recombination.

In this perspective, ES implementation is thus portrayed as an implausible context for digital innovation.

2.3 Second perspective: ES as driver of organizational innovation

The second perspective on ES implementation as context for digital innovation does not focus on the digital, but on the organization's ability to use ES implementation as the driver of innovation in organizational routines. This has largely been explored by studying user organizations from post-implementation perspectives (Berente et al., 2016). The focus is however not directed toward the more technical ES design, and hence digital innovation.

Rather, the processes of managing an inflexible ES are investigated by identifying social characteristics of successful adoption (Berente et al., 2016; Sykes & Venkatesh, 2017). The various organizational characteristics are thus studied in association with the traits and capabilities of the IT solution, emphasizing social attributes as crucial for leveraging innovations (Kharabe & Lyytinen, 2012). Studies suggest that destructive misalignment between use contexts and the ES are shaped by the fusion of three properties: existing practices and the current state of the organization, the actions of individuals, and the capabilities of the system (Goh et al., 2011). Some suggest that it thus requires continuous adjustments of the three properties to handle the lack of technical flexibility (Berente et al., 2016). Hence, successful ES implementation is tightly coupled with conformity with the organizational goals through continuous adjustments, which is deemed important to keep stability in the organization whilst securing autonomy for individuals (Berente et al., 2016). Successful ES implementation is emphasized as accomplished by yielding conformity with the organizational goals through continuous adjustments, which is deemed important to keep stability in the organization whilst securing autonomy for individuals (Berente et al., 2016).

In these studies, the role of the technological artifact is to provide capabilities and options for the user organization (Badewi et al., 2020; Kharabe & Lyytinen, 2012). It is however the organizational characteristics such as skillset and ability to balance between adoption of ES and adjusting of the technology, that are highlighted as important for organizational agility - a trait which is defined as "the ability to detect and respond to opportunities and threats in the environment with ease, speed, and dexterity" (Kharabe & Lyytinen, 2012). Others have argued that since ES is mainly used by operational users, reaping the full value of ES to attain innovation requires a high degree of employee engagement (Badewi et al., 2020). By taking the ES characteristics of streamlining and ensuring data flow into account, the impact on ES innovation is mediated by skills: "organizational characteristics could be important motivators in helping users to learn and improve their quantitative skills so that the ability to innovate from data can be strengthened" (Badewi et al., 2020). Moreover, the role of ES to foster and contribute to digital innovation is argued as a positive enabler only if the ES is able to act as a platform in the organization (Lokuge & Sedera, 2018).

While acknowledging the importance of organizational characteristics as crucial for digital innovation outcomes, this perspective pays little attention to the role of technology design to foster digital innovation during ES implementation (Berente et al., 2019).

2.4 Third perspective: Partners' role in digital innovation

The third and last perspective challenges the portrayal of ES implementation as an implausible context for digital innovation. Rather, various discussions have emerged from recognizing ES's salient role as a technology platform (Foerderer et al., 2019; Lokuge & Sedera, 2018; Sedera et al., 2016). Extant literature has examined the results of ES vendors "opening up" (Farhoomand, 2007) their solutions by increasingly pursuing platform business models (Foerderer et al., 2019). These efforts present a value network where independent actors participate by building on the digital affordances provided by the vendor (Hein et al., 2020). Digital innovation is thus made possible in these constellations due to digital technologies enabling the division of labor (Wang, 2021). Platform ecosystems as IT artifacts are characterized as a technological foundation surrounded by peripheral business actors who utilize the platform for materializing the development of their products (Staub et al., 2021; Tiwana et al., 2010). The notion of ecosystem thus refers to socio-technical arrangements of shared interests and interdependencies that emerge from co-creation between the participating actors (Sarker et al., 2012). Accordingly, an ecosystem affords a collective breeding ground for innovation through value-creating mechanisms (Hein et al., 2020; Yoo et al., 2012).

In contrast to consumer software platforms such as iOS and Android, the nature of ES platform ecosystems is characterized by the necessity of providing highly flexible, complex, and industry-specific solutions that meet the distinctive demands of user organizations (Staub et al., 2021). This generates an interplay between the participating actors geared toward the common purpose of providing value to its users by catering to their heterogeneous needs (Rickmann et al., 2014). ES vendors consequently benefit from nourishing an ecosystem of partners who contribute with services, functionality extensions, and third-party applications (Wareham et al., 2014). Partners specialized in ES implementation are thereby central in realizing the ecosystems' common purpose, which in turn generates value for all contributing actors.

Vendor's efforts are consequently geared toward creating highly configurable, extendable, and flexible solutions (Li & Nielsen, 2019b; Pipek & Wulf, 2009), as well as resources, ensuring access, knowledge, and competence necessary to exploit capabilities (Foerderer et al., 2019; Rickmann et al., 2014). Successfully managing and coordinating such an ecosystem of heterogeneous actors is a formidable challenge and a resource-intensive task for the vendor

(Staub et al., 2021; Wareham et al., 2014). Their attempts to orchestrate these external actors have attracted the attention of many researchers (de Reuver et al., 2018; Engert et al., 2021; Hein et al., 2020; Rickmann et al., 2014). Furthermore, research has been directed towards the organizing mechanisms of knowledge and resource sharing amongst the participating actors (Foerderer et al., 2019; Kauschinger et al., 2021), and towards the dynamics and incentives that drive the engagement of partners (Rickmann et al., 2014; Venkataraman et al., 2018). However, the focus is limited to how partners contribute to generic innovation and less focused on how partners are engaged in ES implementation.

Accordingly, this stream of literature devotes little attention to implementation. However, the technical flexibility generated by an ES platform ecosystem presents a far more promising picture for the potential of combination and recombination towards digital innovation during ES implementation.

2.5 Chapter summary

To summarize, I define digital innovation as the process of combining and recombining digital components that enable change and create novel value in organizations. The dominant perspective in existing IS literature portrays ES implementation as a context with limited potential for digital innovation. Others do acknowledge ES as an enabler of organizational change and innovation, but with limited focus on the digital. Accordingly, limited attention has been directed toward technology design (Berente et al., 2019). An emerging stream of literature reports how vendors increasingly organize their generic solutions as platforms. Yet, the focus is limited to how partners are engaged in *generic* innovation on ES platforms. The nature of ES platform ecosystems involves producing vast amounts of resources, potentially providing immense flexibility for partners set to implement solutions into particular user organizations. Their ability to exploit the resources provided by the ecosystem, in addition to the nature of the resources provided, is thereby imperative for ES's ability to foster innovation. However, the perspective of partners in addressing emergent needs through ES implementation remains to be investigated (Jæger et al., 2020), particularly their role in facilitating digital innovation through the potential that ES platform ecosystems offer.

A relevant and important gap thus remains in understanding ES implementation as a context for digital innovation in user organizations from the perspective of the partners.

3 Theoretical lens: Understanding digital innovation in ES

To examine ES implementation as a context for digital innovation I employ a theoretical framework from Li & Nielsen (2019b). The framework helps in highlighting key processes, actors, and resources involved in ES design and implementation. It conceptualizes two levels of design that refers to both the 'global' development, meaning the collective of generic software features provided by the vendor and its associated ecosystem, and at the level of implementation where software features are exploited according to particular organizational needs (Li & Nielsen, 2019b). The framework proves fruitful in understanding how and where design and innovation takes place in an ES ecosystem, and I will use the following concepts in my empirical analysis:

First, I adopt the concept of **generic-level design** to refer to design activities that produce generic software features such as functionality and user interfaces (Li & Nielsen, 2019). The aim of generic-level design is to create software features that are relevant to many, while excluding particularities of specific needs (Pollock et al., 2007). The widespread adoption across contextually different organizations and industries creates an environment where vendors struggle to cater to specific needs. As a consequence, one part of generic-level design involves various strategies for aligning the needs of the user organizations to identify shared traits (Gizaw et al., 2017; Pollock et al., 2007). There is, accordingly, an inherent tension between the generic software features and relevance to particular use contexts. This calls for the necessity of providing adaptation capabilities in the generic software features to support customization, configuration, and extension according to particular needs (Baxter & Sommerville, 2011; Pipek & Wulf, 2009). Accommodating distinct needs across the many user organizations has largely driven ES vendors to benefit from the expertise of external partners developing generic software features (Wareham et al., 2014). Central to vendors' efforts towards attaining healthy ES platform ecosystems is the involvement of two significant roles, that I here will distinguish to clarify their responsibilities in the ecosystem: (1) partners that will hereby be referred to as Independent software vendors (ISVs) that contribute to generic-level design by developing third-party applications and functionality extensions of the solution offered by the vendor (Dittrich, 2014; Rickmann et al., 2014), and (2) partners that specialize

in implementing ES solutions on behalf of the vendor based on the particular needs of individual user organizations (Li, 2021; Sommerville et al., 2012). The involvement of these two roles is largely driven by vendors' challenge of catering to the extreme heterogeneity that characterizes the domain of ES (Wareham et al., 2014). Supporting these partners is thus of strategic importance for ES vendors. Accordingly, a central part of generic-level design is for vendors to provide the necessary knowledge resources that enable and control the development of generic features (Foerderer et al., 2019; Rickmann et al., 2014).

The process of generic-level design thus produces configurable generic software features and knowledge resources providing adaptation capabilities (Pipek & Wulf, 2009). Accordingly, generic-level design affords pre-conditions that influence the flexibility, the starting point, and the limitations, for the process of implementing generic software features of the ES into particular user organizations (Sommerville, 2008). While ISVs ensure the provision of generic software features *into* the ecosystem (Foerderer et al., 2019; Rickmann et al., 2014), partners are responsible for extracting and seizing the technological possibilities provided by the ecosystem in accordance with user organizations' heterogeneous needs (Li, 2021; Staub et al., 2021). I adopt a second concept of **implementation-level design** to refer to the process that partners specialized in ES implementation conduct to construct solutions for specific user organizations (Li & Nielsen, 2019).

Central to the process of implementation-level design is the design of ES according to the particular needs of individual user organizations (Dittrich, 2014; Sommerville, 2008), by utilizing the flexibility provided through means of customizing, configuring, and extending the generic software features. This context differs from traditional bespoke software development by leveraging the generic software features provided through generic-level design as a basis for localizing solutions according to local practice. Partners are often located "closer" than vendors to the actual use contexts in terms of expertise in their native environment (Ceccagnoli et al., 2012; Sarker et al., 2012), with extensive competence in creating locally relevant extensions and customizations to meet distinctive needs (Wareham, 2014).

Dividing design efforts into two distinctively, yet interconnected activities, helps me to position ES implementation in relation to different actors and processes. When exploring the prospect for digital innovation in ES implementation projects, the prerequisites for the design process is important to emphasize. The possibility for generic software features to be combined and

recombined in response to social and organizational problems becomes vital for the flexibility to organize projects for digital innovation (Nambisan et al., 2017). As such, the generic software features offered through generic-level design constitutes the flexibility and starting point for implementation-level design. These software features are afforded through what Li and Nielsen (2019b) conceptualize as a **design infrastructure**. The design infrastructure encompasses the totality of generic software features and knowledge resources providing adaptation capabilities for partners to exploit during implementation-level design (Li & Nielsen, 2019a). The design infrastructure thus comprises the available technical flexibility to organize ES according to particular needs (Li, 2021), as shown in figure 3. Its content is thereby imperative for the prospect of digital innovation during ES implementation.

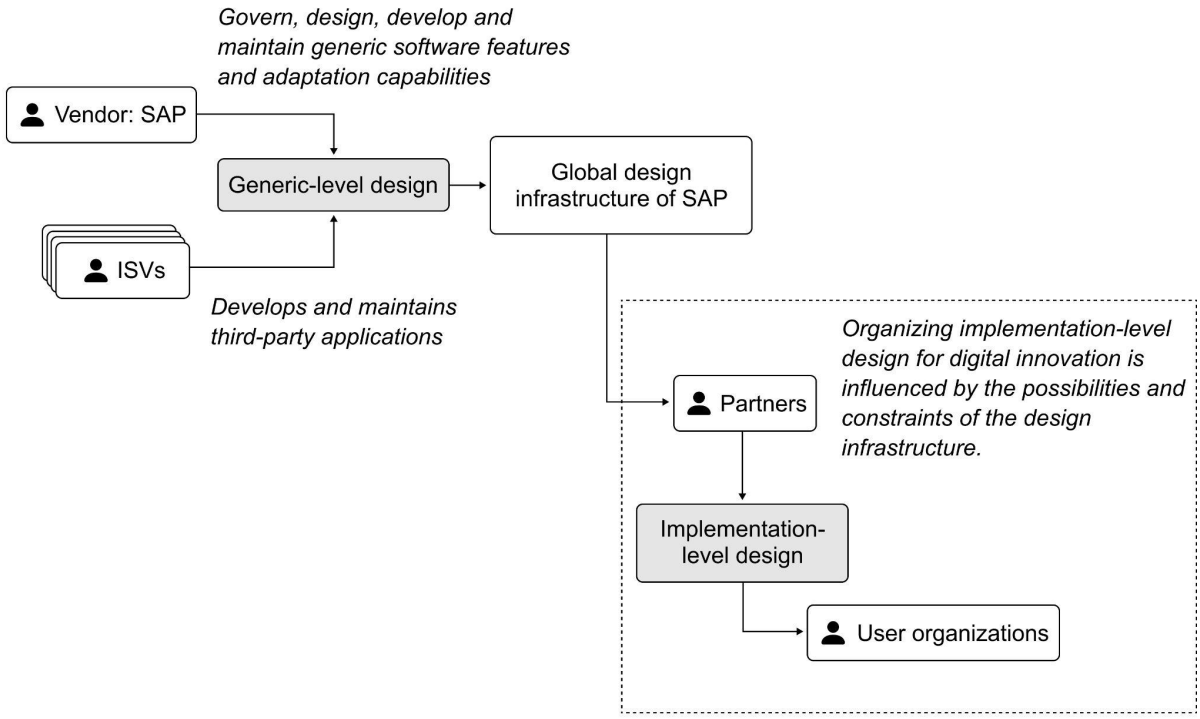

***Figure 3.1**: The collective design activities provide the starting point and flexibility for digital innovation.*

A design infrastructure is specific to one vendor and its associated ecosystem. For instance, the design infrastructure of SAP is limited to their affiliated partners and ISVs. Within the ecosystem of SAP, however, the design infrastructure is **global** to all participating actors, as shown in Figure 3.1, who either contribute with generic-level or implementation-level design.

4 Research approach

The empirical basis of this thesis is a case study that has proceeded through one and a half years. This chapter is organized in the following manner: I will first provide some background information on how the research problem emerged. Second, I describe the chosen methodology for this thesis the philosophical assumptions behind the research. Third, I describe the methods used to derive my empirical findings, before I describe the approach to empirical analysis that I have divided into three phases. Each phase gives an account of involved activities and the role of theory as a basis for gaining an understanding of ES implementation as a context for digital innovation.

4.1 Background and overall research process

This research project is part of the DHIS2 Design Lab (UiO, n.d) at the Department of Informatics at the University of Oslo. The objective of the Lab is to study how to support and promote design and innovation within the ecosystem of one specific ES for management of health data named DHIS2. This work involves exploring how to implement and make the generic software relevant for local contexts. The typical research approach of the Lab is to generate knowledge through engaged research projects that contribute to practical implications for the design of DHIS2. And, moreover, to generate knowledge that is of relevance beyond the case of DHIS2 for those occupied with design and innovation within ES ecosystems more generally. Consequently, part of the Lab work includes conducting comparative studies. SAP was selected as a relevant and major vendor with similar challenges of designing software that can be made relevant across an array of organizational contexts.

The initial research theme for this project was established in the Design Lab. The research problem was further modified and elaborated through reading literature on the generic nature of ES. I developed an interest in ES design, and its potential for forming usable and relevant software in particular user organizations. The literature described ES as rigid and portrayed an implementation process with limited potential for flexibility according to contextual needs (Pollock et al., 2007; Sia & Soh, 2007). Already at the formative stage, the theoretical framework of Li and Nielsen (2019b), which serves as a basis for the framework presented in

chapter 3, was used as an analytical tool to form an understanding of the efforts involved in ES design, both in SAP and in general. I found it fruitful in capturing the complexity of ES into two distinctively different, yet interdependent, design activities. Furthermore, it proved helpful in identifying and positioning the research problem, and in pinpointing implementation-level design and the partners as an interesting context to explore digital innovation during ES implementation. Although revised throughout the project, the concept of generic-level and implementation-level design were both used to form the initial boundaries of the case. These involved examining how vendors of ES facilitate design efforts at implementation-level in terms of resources provided through a design infrastructure. The case boundaries initially involved gaining an understanding of three properties: a) SAP as a vendor and how they conduct generic-level design, b) the content of the design infrastructure, and c) the role of partners and their design flexibility during implementation-level design, capacitated by the vendor. These initial case boundaries were used to design learning goals that have guided the empirical data collection and analysis throughout the project, and were used as a basis for outlining questions for an interview guide that was used during empirical inquiries. While the object of analysis and research problem was revised as new themes emerged from data collection, the case boundaries of ES design and implementation in user organizations remained stable.

Exploring SAP as a vendor had a central position in the initial problem formulation. Accordingly, the goal was to contact and gain access to strategic roles within SAP responsible for design, following rounds of interviews with partners to understand their part in implementation of ES in particular organizations. An influential finding that shaped the final problem formulation for this thesis emerged already in the first interview with one of the partners. The first participant elaborated on their practices to attain innovation when asked about their approach to implementation-level design. Innovation was explained by the participant in the manner of being a key characteristic of this particular partner organization's practice. It was described as the process and the goal of entering into close collaborations with user organizations that endured over time, along with other enabling mechanisms. This led to a change of direction in terms of which perspective to focus on, from vendors to partners. Academic literature on ES design and implementation views this context as restrictive and inflexible, which stood out as a clear gap in contrast to the participant's interpretation of their practice. Innovation did accordingly emerge through empirical enquiries as an interesting

theme to further explore. The research problem's formulation and objects of analysis have undergone gradual and iterative modifications throughout the research process. A plan during the last phase of data collection was to participate in a project with one of the partner organizations, but due to difficulties such as time frame and access, this was not accomplished.

An important step towards developing an initial understanding of innovation in the context of implementation-level design included exploring *how* innovation takes place. This became the basis for a research paper published as a selected paper of the IRIS 2021 conference (Appendix 1). The theoretical outcome of this paper serves as an important part of the final contribution of this thesis and will be explained in greater detail in Chapter 5 - Case Analysis and Chapter 6 - Discussion. The final outcome of the iterative process of formulating the research problem, is the research question presently addressed in this thesis: *How do partners organize ES implementation for digital innovation?* Through analysis of empirical findings whilst engaging in related academic literature, I discovered that the phenomenon of digital innovation during ES implementation was understudied, or portrayed as an implausible context for digital innovation to take place. I considered my empirical findings to be of relevance in addressing this gap. Furthermore, by identifying the differences between partners, a potential emerged in producing knowledge relevant to the real-world context of other partner organizations seeking to organize their projects for digital innovation.

4.2 Research Methodology: Case study

The methodology of case studies is extensively conducted in interpretive IS research (Walsham, 2006), much due to its acknowledgment of being particularly well suited for the field (Benbasat et al., 1987) by producing context-specific knowledge (Flyvbjerg, 2006). Cases are especially useful when investigating problems where research and theory are at an early and informative stage (Benbasat et al., 1987). Explorations through a case study prove useful in gaining an understanding of a broader phenomenon through a particular case (Stake, 2005). In line with this, I have conducted a case study of SAP partners operating in Norway to investigate the broader theme of how digital innovation is organized during ES implementation. As reflected in the research question addressed in this thesis, the investigation attempts to capture a wider perspective than SAP. The aim is to contribute to an audience concerned with a theoretical phenomenon(Walsham, 2006) with regard to the potential for ES implementation to be a context for digital innovation, through *exemplifying* within the set boundaries of SAP

partners and their practices. The aim of the investigations has been to generate exploratory and descriptive knowledge (Myers, 1997).

The philosophical foundation of this research is interpretive (Walsham, 2006; Klein & Meyers, 1999). The focus of the present investigation has been to explore the socio-technical phenomena of design and innovation in ES implementation through the interpretations of relevant practitioners. Further, ES are highly embedded in organizational contexts that are constituted by complex, evolving, and heterogeneous social entities. Interpretive methods prove useful in deriving meaning from such social constructions, through understanding the human interpretation of a context where technology design takes place (Walsham, 1995). I have thus investigated this context through interpretation of the intersubjective meanings of my informants (Myers, 1999). Interpretivism allows me as a researcher to understand the phenomenon of ES implementation through the complexity of human sense-making in a specific setting. This resonates well with the research objective of this study and has guided my process toward the final research question and development of the contributions: an understanding of how digital innovation occurs as a result of two-sided monitoring, and identifying four factors important for organizing ES implementation for digital innovation.

4.2.1 Case description: Norwegian SAP partners

The empirical case of this thesis is a study of the practices of one important actor within the SAP ecosystem. Since SAP was founded in 1972, they have grown to become a multinational organization at the forefront of developing application systems aimed at automating enterprise operations (Farhoomand, 2007). To this end, they have been central in establishing the global standard for ERP software (SAP, n.d). Today, SAP is one of the largest vendors of ES and promotes itself by being considered the global leader in all ES categories, including ERP, customer relationship management (CRM), software for procurement, and human capital management (SAP, n.d). Furthermore, SAP advertises themselves as being an engine for digitalization, transformation, and innovation through its ES portfolio. This makes SAP an interesting and relevant case for investigating implementation-level design as a context for digital innovation in particular user organizations.

4.2.2 Partners in ES ecosystems

Although the initial ERP system was designed to be an off-the-shelf package, companies often found it overly complex to install and run (Farhoomand, 2007). As functionality grew substantially over time, by constantly utilizing new technology and developing industry-specific features, the flexibility of SAP to accommodate heterogeneous needs increased. However, implementation remains a complex task for any user organization because "cross-functional operation of integrated ERP systems requires an end-to-end perspective on operations that companies rarely have" (Jæger et al., 2020). Hiring an experienced partner for the responsibility of implementation-level design has thus been defined by many researchers as a critical success factor for such investments (Jærger et al, 2020). To this end, in 1992, SAP launched its partner strategy. The aim of this strategy was to outsource the task of implementation-level design to independent consulting firms to accommodate the demand for SAP technology. And furthermore, to actors located closer to the actual use contexts with a better understanding of organizational culture and particular needs (Wareham, 2014). This has remained a successful strategy, which today has grown to become a global network of approximately 21 000 partners (SAP, n.d). Partners are often big players within their respective industry of IT consultancy (Staub et al., 2020), such as Accenture or Capgemini. Their tasks have traditionally involved integrating business processes with ERP systems to support the user organization's business model (Jæger et al., 2020). Now, partners in ES ecosystems can offer a wide range of specialized consultancy services for various domains and industries to address the needs of a large, globally heterogeneous group of end-users. Particularly, their competence stems from experience acquired through several implementation-level design projects and bespoke software projects for multiple clients. Table 4.1 represents a short description of the organizational size of the partners contributing to the present investigations of this thesis.

Partner number	Description
1	A Norwegian-based consultancy with approximately 250 employees that specializes in ES implementation in the Nordic countries.
2	A large consultancy firm with 2,500 SAP consultants worldwide, and an ES department located in Norway.
3	A large consultancy firm specializing in ES with over 100 consultants in Norway.
4	A global actor within IT, with more than 70 000 SAP consultants worldwide.
5	European-based consultancy firm specialized in ES.
6	A small Norwegian-based consultancy with approximately 30 consultants specialized in ES.
7	A global consultancy firm with more than 8000 SAP consultants worldwide.
8	A large and global consultancy firm with long experience as SAP partners and experience from hundreds of implementations.

***Table 4.1**: List of numbers and descriptions of the partner organizations.*

4.3 Data Collection

In this section I present the activities conducted for data gathering throughout this research project.

4.3.1 Interviews with partner organizations

The primary source of information has been collected through 13 in-depth interviews with representatives from multiple partner organizations. Each interview has had a duration of approximately one-and-a-half to two hours. The goal has been to explore the practices of partners during implementation-level design to gain an understanding of important aspects for

digital innovation to take place. It has thereby been central to gain insights and perspectives from multiple partners to identify the general tendency of implementation practices, with an emphasis on the interpretations across partners. I thus reached out to as many Norwegian partners as possible and held interviews with those who were available and had the time. The aim was to gain an initial understanding of the complex landscape of ES implementation, while identifying how it could be a context for digital innovation.

For the most part, the informants participating in the interviews had leading positions within their respective partner organizations, and were thereby in charge of the strategic direction and overall approach to ES design. Additionally, some interviews were held with consultants hired in the various partner organizations with more active roles in implementation projects. These represented consultants within both business- and software development. Their input aided towards understanding the more technical part of projects. Most informants were mainly identified from SAPs Partner Finder (SAP, n.d), which is a website where user organizations can explore the expertise, location, and contact information of partners affiliated with SAP. Others came through snowball sampling, where enrolled informants recommended and provided contact information to potential informants who they considered influential.

The interviews followed a semi-structured format organized according to a set of overall learning goals for the data collection phase. The initial learning goals, which were later revised as new themes emerged, included questions related to: a) understanding the nature of partners, b) understanding what resources partners have available during implementation-level design, c) understanding the process and activities involved in implementation-level design, and d) strategies and mechanisms of SAP as an ES vendor in relation to facilitating implementation. As new topics emerged, these became to include e) digital innovation during ES implementation.

The key question revolved around implementation-level design as a process, which was explained as “the process by which you are awarded a contract with a user organization until the finished software is in use”. In light of this explanation, the participant was asked to explain their practices and approach to implementation-level design. This allowed the participant to take the lead in the discussions. Follow-up questions were asked when interesting topics or arguments emerged, related to the learning goals I had set for the data collection phase. As the data collection progressed, a second interview was held with some of the informants. The

questions could in these instances be pointed towards more concrete areas such as discussions revolving around collaboration with user organizations. Table 4.2 provides an overview of the participating informants.

Participant Role	Number of interviews	Partner number
Head of ERP department	2	2
CEO	1	1
Board member	1	1
Business consultant	1	8
Developer consultant	1	7
Head of ERP department	1	3
Head of ERP department	1	4
Solution architect	1	4
Head of ERP department	1	5
Board member and senior consultant	2	1
Head of ERP department	1	6

***Table 4.2**: List of the informants' roles, affiliation, and the number of interviews.*

4.3.2 Document analysis

A second source for the data collection phase was various documents provided by several of the partner organizations. The documents included material that explained the process and content of different approaches to implementation-level design, and showed phases and activities. These were used by the informants during interviews to showcase and explain various activities, and provided by email subsequently. Although practices differed across partner organizations, the documents provided a valuable tool towards understanding the processes and to materialize the topics that were discussed during the interviews.

A third and final source which has been a helpful instrument in understanding the complex ecosystem of SAP has been their various websites and open-access learning material. SAP has for instance published a book on their preferred approach to Design Thinking with SAP functionality. I have for observation purposes attended an online seminar where representatives from SAPs UX-department showcased their new interfaces. This has been valuable to get an introduction to how SAP promotes their design flexibility for implementation-level design

4.4 Data analysis

The analysis of this thesis has been a continuous process of engaging in literature and analyzing empirical data to iteratively shape the final contributions of (1) a conceptualization of how innovation takes place during ES implementation through what I coin a *two-sided monitoring process,* and (2) identifying four factors that appear as consistently important across partners for organizing ES implementation for digital innovation. The approach has been based on thematic analysis (Braun & Clark, 2006) for attempting to make sense of empirical insights, while examining a range of concepts from relevant literature streams. The final result led to the development of contributions for both theory and academic literature.

This subchapter is structured into the following three phases: (1) Understanding the activities involved in implementation-level design, (2) Understanding the partners practices, and (3) Identifying factors important when organizing projects for digital innovation.

4.4.1 Phase 1: Understanding the activities involved in implementation-level design

The first phase of empirical analysis involved gaining an understanding and overview of implementation-level design. An ongoing activity following each interview was to transcribe and search the data for important and interesting findings. To begin with, several interesting areas that were related to the technology in use, projects, user organizations, and general practices were highlighted. This activity was revisited several times as the scope was further actualized. Categories were developed to gain an overview of the activities involved in implementation-level design. Figure 4.1 shows an example of the analysis after one of the first interviews where I attempted to make sense of the different phases and steps of an implementation project as explained by one of the informants. Similar overviews were carried out for other partners as new interviews were conducted. This resulted in five activities involved in implementation-level design that were identified as important and general across partners and projects, and are explained in greater detail in Appendix 1.

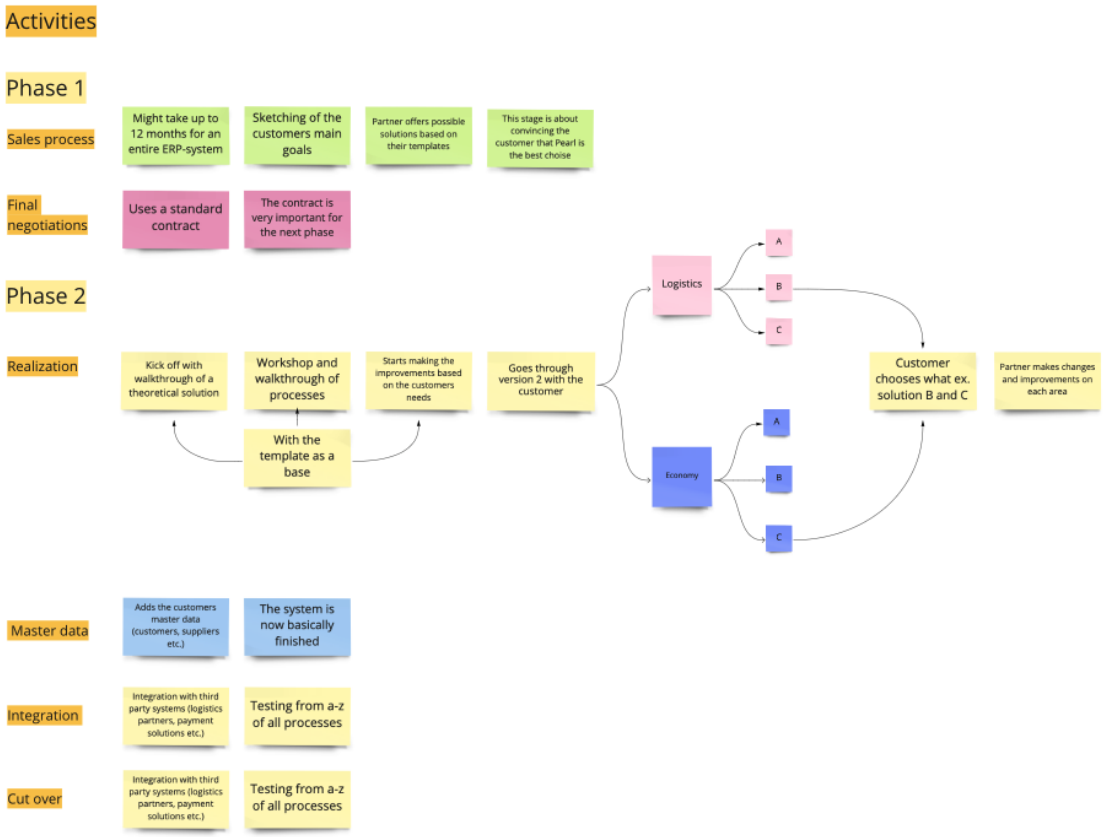

***Figure 4.1**: One example from analysis of the steps and phases involved in a typical implementation-level design process.*

4.4.1.1 Understanding interdependencies during implementation-level design

To structure the next round of analysis, I used the theoretical framework (Chapter 3) to view the partner' position as situated between the technology located in a design infrastructure, and the needs of the many user organizations. To apply this framework to my data, it was helpful to derive new categories that summarized the discussions with informants: 1) traits and content of the design infrastructure, 2) partner-specific findings, 3) the relationship between partners and user organizations, 4) traits of the user organization, and 5) findings related to the process of implementation-level design (Figure 4.2). These were sketched into a template that was used to fill in relevant findings for each partner after completed interviews, providing a new basis for identifying differences and similarities for the various categories.

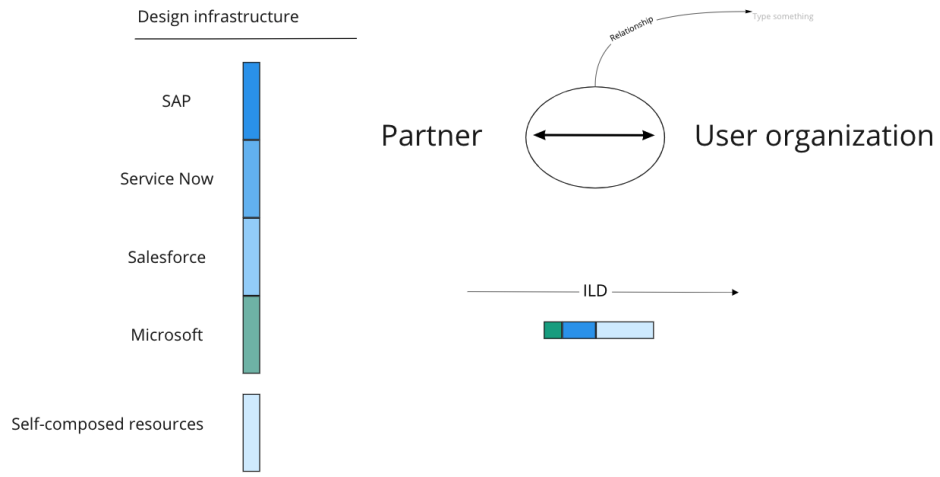

***Figure 4.2**: A template used to fill out the findings for each emerging property following each interview.*

4.4.2 Phase 2: Understanding partners practices

After an initial understanding of implementation-level design was established, new questions emerged. Digital innovation became a recurring and consistent theme that emerged from the data. The focus was consequently shifted to explore digital innovation in the context of implementation-level design. It was thereby imperative to first gain an initial understanding of partners' practices in this context. An important step was to gain insight to the landscape that partners operate in, to understand what they had available in terms of tools, methods, measures,

user needs etc. As partners implement ES on behalf of a vendor, the knowledge boundary resources and software features provided by the vendor are important for the design flexibility during implementation-level design. This understanding was brought into the following interviews to identifying the technical flexibility on the one side, and the characteristics of the relationship between partners and user organizations on the other. In terms of continuing to use learning goals as a fruitful way of asking questions to both the existing empirical data, new informants, and look to relevant academic literature, the goals were iterated on accordingly to focus on a) understand the partners' role in implementation-level design, b) understand the technical flexibility of the design infrastructure, and c) understand the phenomena of digital innovation (Table 4.3).

Learning goals	Academic literature
Understand the partners' role in implementation-level design Understand the technical flexibility of the design infrastructure	Look to existing literature to understand the partners' role in ES design by investigating ES platform ecosystems (Foerderer, 2019; Rickmann et al., 2014; Wareham, 2014; Staub et al., 2021; Li, 2021).
Understand the phenomena of digital innovation	A more in-depth literature study was conducted to uncover definitional characteristics of innovation/digital innovation (Yoo et al., 2010; Yoo et al., 2012; Henfridsson & Bygstad, 2013; Nambisan et al., 2017, Hund et al., 2021)

Table 4.3*: The role of theory in providing insights and sense making of empirical inquiries.*

4.4.2.1 Conceptualizing how digital innovation occurs

An apparent goal involved identifying how innovation takes place after it was emphasized by the informants as an important aspect of their practices. The aim was to make sense of how they address innovation in a context that was deemed inflexible, and where the contextual particularities of user organizations were reported from both academic literature and the

informants as extremely heterogeneous. It became evident that the context of implementation-level design pointed to key characteristics of the partner to partly deal with the vast amounts of software features provided by the vendor, and partly to be able to collaborate and meet the expectations and needs of user organizations. The partners' position as *two-sided* became increasingly more apparent during discussions with informants. An initial finding that emerged early on came to be of great importance for developing an understanding of how digital innovation takes place. All partners emphasized the importance of organizing projects according to overall goals and were generally negative towards the more traditional way of receiving exhaustive requirement specifications. Their reasoning was to secure the space for innovation and doing things in new ways. This understanding triggered the inquiries of how the partners were able to "translate" or "map" the technical possibilities from one side, with the emerging needs from the other.

The process of developing an understanding of digital innovation in the context of implementation-level design has involved identifying patterns in the empirical material. Rounds of coding were conducted in the process of identifying the characteristics of the activities leading to digital innovation during implementation level design. The results transpired from the understanding of partners as positioned between two evolving environments, the design infrastructure and the needs of the user organization, and thereby somewhat influenced in light of the theoretical framework. The conceptualization of an activity leading to digital innovation, however, was identified from the coding of partners' practices and how they continuously *monitor* the two evolving environments. The concept of monitoring relates to empirical findings transpiring from discussions around collaboration with user organizations, dealing with heterogeneous needs, exploiting generic resources from the design infrastructure, building custom software features, and the specialization of partners in both IT and business. The context of implementation-level design was described by the informants as increasingly more flexible than what academic literature portrayed. Furthermore, the inquiries revolving around mapping technological possibilities and emerging user needs became the basis for conceptualizing *how* digital innovation takes place through "two-sided monitoring".

4.4.3 Phase 3: Identifying factors for organizing projects for digital innovation

To structure the initial analysis of the last phase, I revised the template. In this final phase, the task was to identify interdependencies between the different categories, and how they were

connected in terms of enabling digital innovation. In this process, new concepts from the literature were used and tried on the data to further understand what the findings represented and could be a case of. Some of these concepts included digitalization (Osmundsen et al., 2018) and technochange (Markus, 2004), concepts that are close to digital innovation and related to technology driven organizational change. However, after revisions, digital innovation materialized as the best concept for understanding the processes explained by the partners. Simultaneously, I went back to reading through the transcripts and further coding the data by highlighting statements deemed most relevant. A substantial amount of data was gathered on partners' practices that began to paint a picture of the processes, activities, and traits of the different categories. Figure 4.3 shows the attempt to collect and analyze the findings identified across partners. The enabling properties for digital innovation, beyond the flexibility located in the technology, took time to establish due to the complexity of the many interdependencies between the practices, approaches, and dynamics of the relationship between partners and user organizations.

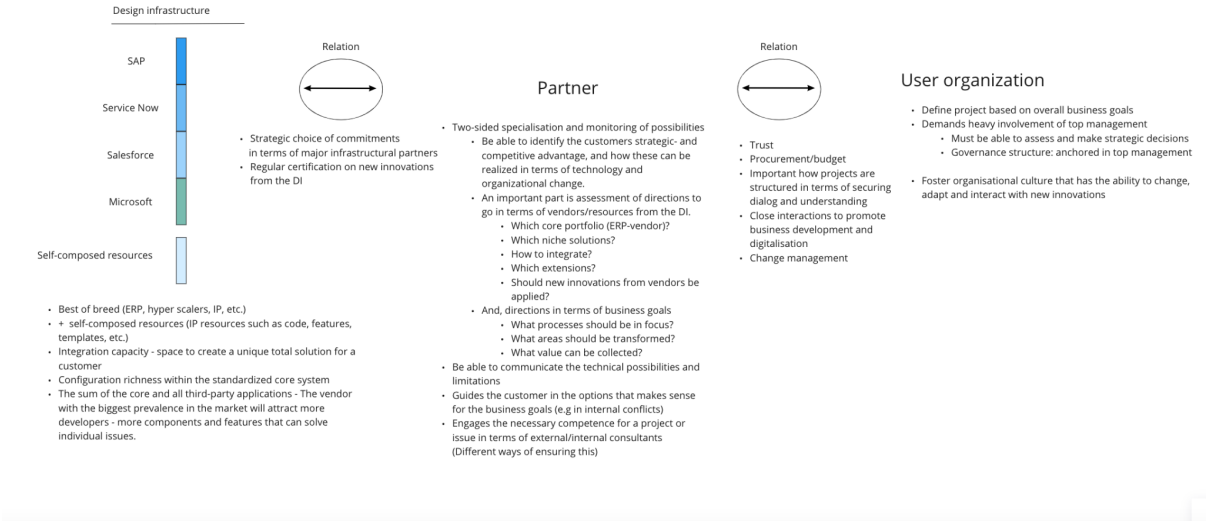

Figure 4.3*: Figure used for the analysis of important factors of each property for the collective of partner organizations.*

4.4.3.1 Forming the contribution

Throughout the research project, from the preliminary stages, to the final analysis, I discovered what I considered to be consistent theoretical gaps concerning two areas: a) insight into the

context of implementation-level design, and b) the potential for digital innovation during implementation-level design. As I was not engaged in an active implementation process, the thesis could not be presented as an implementation study. What was apparent, however, was that the data represented findings that could address the theoretical gaps. A new round of analysis was conducted simultaneously as I revisited the transcripts from the last and particularly influential interviews. These discussions were more shaped towards shedding light on how digital innovation is facilitated. Meanwhile, a last stream of literature contributed towards shaping the contribution (Table 4.4). It contained research that was occupied with emphasizing the potential for digital innovation in ES ecosystems, however from different perspectives: either involved in understanding generic innovation, or the social characteristics in user organizations able to benefit and innovate from implementations, with little attention to either ES design or the practices of partners. A last theoretical gap thus emerged, in (c) the *role of partners* in organizing ES implementation for digital innovation.

Learning goals	Academic literature
Understanding digital innovation in the context of ES design and implementation. Understanding the partners' perspective towards attaining digital innovation in user organizations.	Identify how the potential for digital innovation has been portrayed in the context of ES by existing research (Sedera et al., 2016; Lokuge & Sedera 2018; Kharabe & Lyytinen, 2012; Badewi et al., 2020; Li, 2021)

Table 4.4*: Looking to relevant literature streams to find answers to the learning goals.*

The last months was spent identifying and extracting the most relevant and important findings. By continuously revisiting the empirical data and existing categorizations throughout the projects, I developed themes that first represented conditions for digital innovation to occur. After several iterations, the conditions were sculpted towards representing factors that were important for organizing projects towards the goal of securing and facilitating digital innovation. Table 4.5 exemplifies how statements from the empirical data led to codes and identification of the final factors.

Data	Code	Theme: Factors
"All these ERP solutions are extremely rich in functionality, which is great, but a challenge is if you accept that a customer enters with 2500 detailed requirements. Instead, the customers should ask how our solutions can solve their overall needs and goals, and I fundamentally mean that this is a better approach when moving from something old to a new solution".	The relationship between partners and user organizations, how projects are structured.	**Organizing projects by high-level business goals:** The partners seek to organize projects based on overall business goals to ensure a strategic direction where governance, practice, and technology are holistically aligned.
" Retailers in the Nordics have a lot of common processes, so let's see what is possible to reuse again and again, and rather focus on the other things. This way we get a customer base that is quite similar, and this is important in ensuring that we can aid them over time"	The technological flexibility of the design infrastructure: division between generic- and custom software features	**Identifying a user organizations' particularities for strategic advantage**: Partners leverage generic resources to support needs that are similar across user organizations. They build custom features to provide novel value when particularities can provide competitive or strategic advantages.
"We have heavily involved partnerships with our customers. We attend board meetings and next year's business development and what they need to do… We have a grand responsibility for them."	The relationship between partners and user organizations	

***Table 4.5**: Example of coding and identifying themes to form the various factors.*

5 Case analysis

I now turn to the case analysis of how partners organize implementation-level design projects for digital innovation. I have divided the chapter into nine subchapters that each accounts for an issue important for the informants when organizing projects for digital innovation. These subchapters are organized in the following manner:

First, I briefly explain two different types of implementation-level design projects that are both important for digital innovation. The aim of this section is to provide a basis for understanding how projects are organized (5.1). Second, against this backdrop, I describe the technical flexibility provided by partners sustaining what could be seen as *partner-specific* design infrastructures. These are leverages to attain digital innovation (5.2). Third, partners build custom software features in addition to exploiting generic software features. This is instrumental for digital innovation to take place (5.3). Fourth, the need for partners to specialize to manage the competence-intensive task of attaining digital innovation is described in some detail (5.4). Fifth, I explain how partners seek to organize project structure for digital innovation (5.5). Sixth, I account for how some partners manage to strengthen their capacity to attain digital innovation (5.6). Seventh, I explain why identifying a user organization's strategic advantage is important for digital innovation (5.7), before I proceed with outlining how implementation-level design sustains over time (5.8). Finally, based on the empirical findings, I highlight four factors that emerge as important for organizing ES implementation for digital innovation (5.9).

5.1 Two types of implementation-level design projects

Typical implementation-level design processes may have different outcomes, goals, scale, and activities. However, two main kinds of projects are essential for the efforts toward attaining digital innovation in a user organization as shown in figure 5.1: (1) Implementing a digital core to manage fundamental processes, and (2) running continuous innovation projects where existing configurations are adjusted, functionality is extended, or new software features are added.

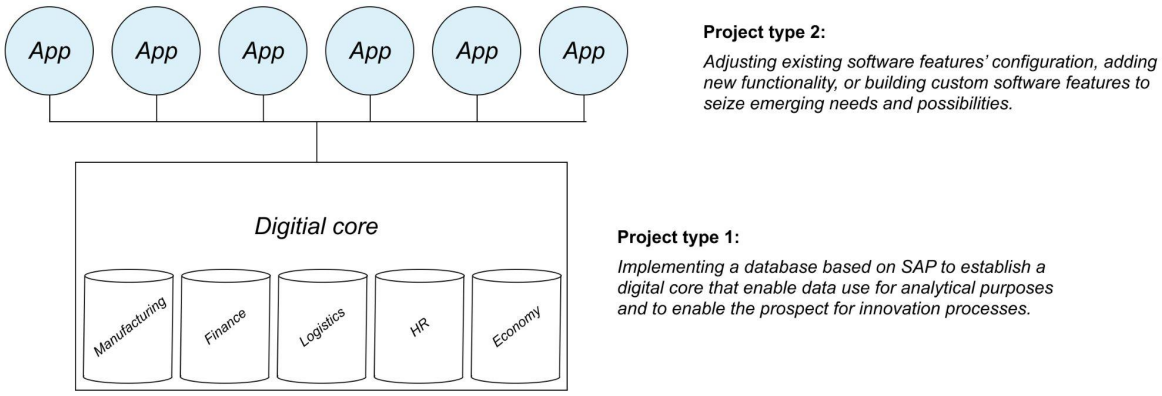

***Figure 5.1**: Two typical types of implementation-level design projects*

Implementing a centralized database acting as what the informants refer to as a digital core is necessary for all new ES projects. The core includes modules for managing fundamental processes, such as manufacturing, finance, human resources, and logistics. The purpose is to capture high quality data that can be retrieved and utilized for analytical purposes, and as an important instrument for new software features when attempting to support evolving business needs. Establishing a digital core is thereby a key aspect of laying the groundwork for digital innovation:

> Twenty years ago, the focus of SAP was to capture data and ensure data control so that it flows through the processes. Now, the focus is on getting data out, retrieving and using data for analytical purposes, and driving innovation processes. This has had a significant influence on changing the whole approach to implementing this type of project. (Head of ERP department, Partner 2)

Implementation-level design projects of this kind are typically great investments for a user organization and may last a period of one to two years. A digital core, such as one provided by SAP, is typically configured within the set boundaries offered by the vendor to avoid maintenance efforts of changes in the source code. In return, SAP releases new innovations within the core's modules regularly that user organizations can benefit from by not deviating from the standard. These innovations can involve new ways of capturing or analyzing data or utilizing novel technologies, such as artificial intelligence and analytics. Projects that include implementing a digital core tend to follow a traditional development approach with more linear steps, from initial negotiations to building, testing, and implementing the software solution.

However, the options for configuration in SAP are described by all participating partners as highly flexible, allowing for partners to shape the digital core to accommodate most individual needs of a user organization. The purpose of providing the user organization with a digital core is, however, to secure a stable database that can accommodate evolving needs by acting as a platform to be further built upon, and thereby allow for scaling.

> This is how SAP would sum up their sales pitch on why a core solution with SAP or equivalent ERP at the bottom is wise. You create an innovation platform at the bottom that holds and controls your core data, and you'll get some innovation and development through ongoing processes that the supplier already works with for other customers. And then you can build your advanced and important functionality on top where you have the need for differentiation. (Head of ERP department, Partner 4)

For user organizations with an existing digital core, or as a second step after the complex process of implementing one, projects with a shorter time span are continuously conducted. These projects are hereby referred to by the informants as "innovation projects". An innovation project involves further tailoring the ES solution according to specific needs, often beyond what the standardized configuration facilities offer. Such efforts usually involve building software features for specific business processes or emergent needs but can also include customizing user interfaces or adjusting the configurations within existing software features. The partners stress that innovation depends on the value generated from the outcome of such projects. They are thus usually not clearly defined in advance but can be a result of finding ways to support and materialize an emergent business need or opportunity. These projects rely on data from the digital core and involve combination and recombination of software features to provide value and seize new business opportunities. Most investments in digitalization, and digital innovation efforts, occur through innovation projects to constantly tune the ES solutions to evolving needs and thereby support the strategic direction of the user organization.

Accordingly, partners rely on two types of implementation-level design projects to organize for digital innovation. One informant exemplifies how ensuring data quality in a digital core and constantly conducting innovation projects are interconnected:

> This type of innovation [what is referred to as innovation projects above] involves applications. It involves how you work, how you think, and how you invent new products. An example is how you can use data to reduce the organization's footprint on the environment and resource consumption. An example is the environmental aspect of food production. Let's say you want to get better control of wastage. Or an

> overview of what gets bad in stock. How can you detect this earlier and sell it at a slightly lower price, so it is sold instead of thrown away? SAP has come up with a new product that allows you to enter data on the environmental impact of the various raw materials and components so you can start making more conscious choices. But it requires data quality, and we see that more and more of our customers have become better at realizing this. And it requires that you have sufficient system support. (Head of ERP department, Partner 4)

5.2 Sustaining a partner-specific design infrastructure

As outlined in chapter 3, SAP provides a global design infrastructure enabling the partners to conduct implementation-level design. These design infrastructures consist of configurable generic software features and various knowledge resources to support development and provide adaptation capabilities. Furthermore, the design infrastructure offers business- and industry-specific software features for the partners to exploit. This provides flexibility when attempting to design ES solutions relevant to the local needs of particular user organizations. However, the informants' report that their main priority is to find solutions to solve the user organization's challenges and support emerging opportunities while business needs evolve. The informants report that all user organizations are experiencing increasing end-user demands from their customers, and that user organizations are more concerned with digitalization of their enterprises. Technological advancements support increasingly complex business cases in line with rising user expectations. Accordingly, staying within the boundaries of SAP's global design infrastructure has become challenging for the partners. Instead, they have found means to ensure necessary technological flexibility by leveraging multiple vendors' software features and knowledge resources. The partners are to a greater extent detached from SAP and are instead affiliated with several ES providers. This signifies that they are no longer exclusively subject to the capabilities of SAPs design infrastructure but can leverage new possibilities from other sources. According to the CIO of one partner organization,

> [i]t is important to choose a platform as a strategy for developing the solution. You either choose Azure, Amazon, or Google which have made tons of functionality available that is a lot cheaper than what an ERP vendor provides. Amazon has great integration tools for instance. (Partner 1)

The partners thus sustain what could be seen as individual and *partner-specific* design infrastructures based on a selection of features from the global design infrastructures of several ES vendors, such as large-scale vendors like Salesforce or Microsoft. They may also include

software features from other ISVs than those who contribute with generic-level design on behalf of an ES vendor, offering niche solutions for specific functionality. The informants leverage this partner-specific infrastructure across their implementation-level design processes with different user organizations.

Forming partner-specific design infrastructures is partly made possible by vendors facilitating partners in building integrations by offering APIs. This may ease vendors' challenges of offering generic software features and associated configurability that can cover heterogeneous use cases and needs. Accordingly, the partners are enhanced with a significant potential and flexibility for digital innovation by combining and recombining generic software features from several vendors. One informant offers the following reflection:

> A lot has happened here in the last five years [...] I think SAP also recognizes that they can't deliver on everything. They don't have a product portfolio covering all needs. Instead of using resources to develop and acquire companies for very specific needs, it is easier for them to facilitate integrations, and sell licenses for the communication that goes to other systems, so that they get some of the money you spend on it as well [...] They get more satisfied customers. My opinion is at least that there has been a big change in the state of mind of SAP. It is absolutely necessary for them to survive. (Architect, Partner 4)

A partner-specific design infrastructure provides each partner with individual capabilities depending on which vendors they are affiliated with, and of what software features they choose to include. The content of the partner-specific design infrastructure constantly evolves in line with each vendors' development of new generic software features. Partners are thus dealing with capabilities that are in constant change. New software features that pose new possibilities are made available, while existing software features may be revised. Consequently, as shown in Figure 5.2, an important activity that partners carry out is to continuously monitor new possibilities that emerge from the global design infrastructures:

> That's exactly what [Partner 1] does. You should be someone who monitors the ecosystem and can approach their customers and say that something very exciting has been created that we think can be commercially interesting for you. One cannot expect an ordinary customer to have an overview of these things - it is completely impossible. There are two things that a partner in 2021 must be very good at. One is to monitor everything that happens in this larger ecosystem of developers out there, the other is to constantly follow what is happening in the underlying platform that Azure and

Amazon are constantly developing [...] this is a big job. (Board member and senior consultant, Partner 1)

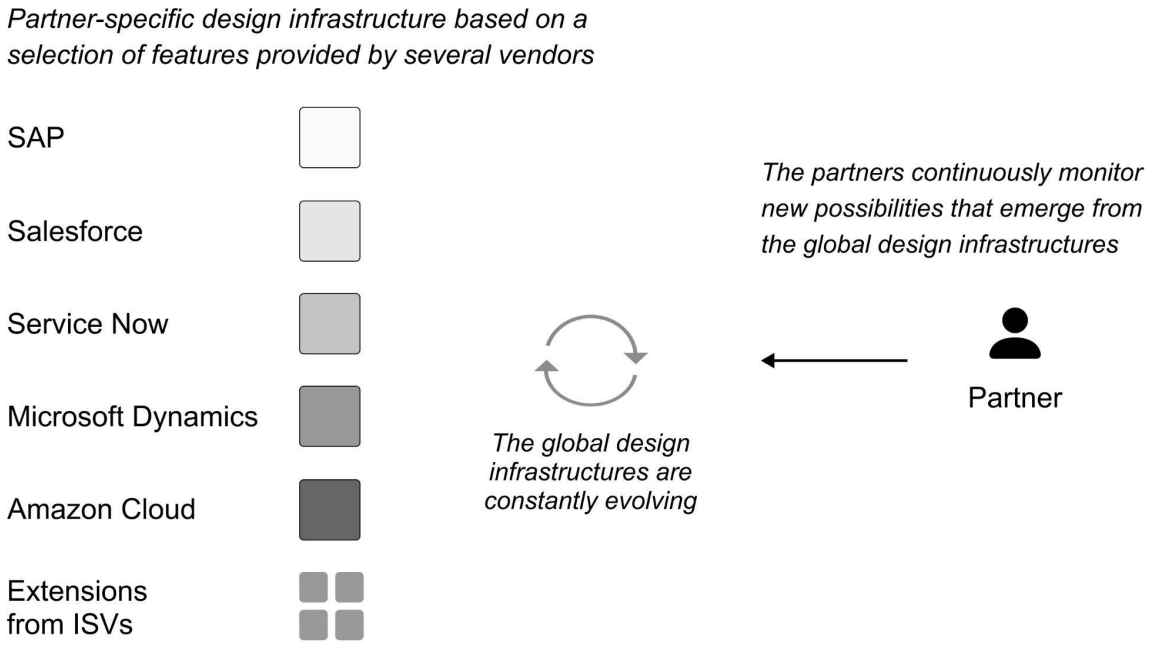

***Figure 5.2**: The partners continuously monitor new possibilities that emerge from the global design infrastructures.*

They continuously monitor to sustain a comprehensive understanding of the technological possibilities that emerge, and assess how new features may be of value to the various user organizations they serve. And, equally important, to determine if software features are irrelevant. New features that have the potential to support a business case or need may be introduced in a user organization through innovation projects. In this context, monitoring new possibilities in the design infrastructure represent active assessments that promote the potential for digital innovation.

5.3 Building custom software features for specific needs

Partners have a broad selection of generic software features and knowledge resources to leverage by building partner-specific design infrastructures. However, as noted by an experienced informant: “I have never experienced a project where everything can be solved solely based on the configuration possibilities. They can never solve all obstacles”. Besides

facilitating the partners possibilities of shaping partner-specific design infrastructures, the vendors also enable the development of custom software features.

> I would say that the vendor that offers the richest, most well-documented, and accessible API-capacity also provides the biggest opportunity-space for innovation, because they give their customers unlimited opportunity space to connect whatever it may be of pre-composed and self-developed extensions. (Board member and senior consultant, Partner 1)

Developing custom software features accounts for a significant part of the partners practices during implementation-level design projects, and provides important flexibility that strengthens the potential for catering to specific needs. They are often built through innovation projects and may be a recurring activity in a user organization as new needs or possibilities emerge. The partners have the opportunity to leverage the prospect for combining and recombining generic and custom software features as they see fit to promote digital innovation. Developing custom software features is an opportunity that the informants report taking advantage of in all projects.

The partners occasionally develop custom software features, ideas, or other resources for a specific user organization that they recognize as relevant beyond the designated use context. In such instances, they attempt to secure ownership and gain intellectual property (IP) of the software features, allowing them to apply it across user organizations. This generally counts for features that are not created to support processes that are of strategic importance to the competitive advantage of the user organization, and thereby a threat if shared with competitors. When successfully securing ownership of a self-developed resource, it becomes part of their partner-specific design infrastructure. These efforts play an important role in gradually shaping the partner-specific design infrastructure with specialized software features, concepts, and ideas specifically available from an individual partner.

The partners are all approaching implementation-level design by combining and recombining generic and custom software features to solve heterogeneous needs and attain digital innovation:

> It is a matter of finding the optimal balance between these three resources [from SAP, ISVs, and custom]. I have become more and more positive to be able to self-develop for the simple reason that the APIs are there, which is a prerequisite, but also that the development tools that are available now have gradually gotten to a level that means

> that the pace of development has increased dramatically […] you can do an incredible amount of exciting development precisely to support innovation and at a reasonable price, as long as it hits a reasonable cost/benefit ratio. I think we are in an exciting time around this. (Board member, Partner 1)

> For retailers, it is absolutely essential to be able to see when goods can be delivered to a customer - in and outgoing logistics. This information is also core functionality that can be accessed as a microservice that you then can build tiny web shops or pop-ups or whatever based on what you retrieve from the backend. So it is not a straight yes or no answer on whether this is ERP-functionality, commerce-functionality or developed by us, because it is really all three of them simultaneously. (CIO, Partner 1)

5.4 Specialization

Technical flexibility to cater to particular needs during implementation-level design poses significant demands on the partners' expertise. The informants emphasize the need to constantly comply with the evolution in each of the global design infrastructures they are affiliated with. Each associated vendor enforces governance structures that partners must act in accordance with to benefit from the resources of their global design infrastructures. SAP, for instance, requires consultants to be certified in their various modules and specific software features as a prerequisite for serving as their partner. The partners portray an environment that is in constant change, and new software features are constantly developed and improved in the global design infrastructures. Specialized training and courses in the form of certifications must thus occur regularly to keep up with new features that allow the partners to utilize them during implementation-level design. This implies that the partners must consistently be aware of the technological shifts, trends, and software features afforded by the constituent parties of their partner-specific design infrastructures. Furthermore, emerging and evolving user needs may require novel solutions that may not yet be available. As such, the partners also pay attention to the general technological evolution outside the boundaries of their partner-specific design infrastructure to detect relevant functionality. This poses a significantly competence-intensive exercise for the partners, who must persistently assess the technological possibilities available in the design infrastructure whilst sustaining a comprehensive understanding of the technological developments and trends as they evolve.

While vendors offer APIs and various knowledge resources, the possibilities for combining services and software features with different origins requires partners to gain significant

expertise in building integrations in order to gain more design flexibility. As exemplified by one CIO:

> [...] What is happening now is that there is a greater need for integrations than ever. Think of the last year and what it has driven in terms of the need for innovation and digitalization. The needs of the end consumers are increasing simultaneously as new technology is constantly being made available. There has never been a faster technological shift than now. Cloud is, for instance, a nightmare if you cannot get the integrations correct. You cannot simply take a cloud solution from Salesforce and an ERP from SAP and expect it to work. You must build integrations. However, the things we did ten years ago, two years ago, and are doing today are constantly changing, and they will continue to do so. (Partner 7)

The partners' specialized expertise evolves in line with the possibilities and constraints posed by the existing and emerging software features available in the partner-specific design infrastructure. However, deciding to affiliate with various global design infrastructures requires specialization and expertise within the software features available. This is a large task that causes complexity when monitoring possibilities. The partners thereby choose affiliations carefully, and rather pursue specialization in a narrow array of software features provided by global design infrastructures. This is especially emphasized by the informants who represent small partner organizations where the resources must be prioritized:

> Clearly, we must know and be the best at SAP. And we must be very good at using the tools that we promise to be good at. Like SAPs cloud tools, or SAPs commerce solution, and Salesforce's marketing solution, and so on. Last week we sat and discussed what to choose of Azure or Amazon - we have to decide on something that we then use our resources on because we cannot be good at or know everything. (CIO, Partner 1)

The partners take further measures to deal with the complexity of navigating vast amounts of technical possibilities afforded by the partner-specific design infrastructure. In order to effectively design solutions that align with the user organization's structure, partners must also be specialized in the industry, business segment, and business processes according to the user organizations operations. A measure partners take is thus to shape their expertise to particular industries. By doing this, they can strategically choose software features that work particularly well for solving needs. This could for instance be industries that require complex solutions for logistics, that the partner then invests resources in specializing in. Over time, the profile of user organizations that the partner is specialized in collaborating with tends to converge. The

partners report that these measures and their overall specialization contribute to their capacity for digital innovation. It sharpens their expertise in understanding the particularities and needs of the user organization at hand. The collective efforts invested in specialization is reported by the partners as imperative for handling the competence-intensive task of implementation-level design:

> We try to understand the intention behind a need, how the customer works, and provide input on how to solve an issue. We have for instance worked with a customer who needed to inspect various objects and needed an inspection plan. Instead, we proposed that they should use sensor technology to count the number of visits, and the number of tremors so that they could inspect when the sensor had counted a fixed amount. This resulted in innovation for the customer because they could go out to inspect less often, and when needed. (Head of ERP department, Partner 5)

5.5 Negotiating project structure for digital innovation

All informants emphasize the importance of structuring projects according to overall organizational goals, as opposed to a finely granulated requirements list based on the current organizational state of affairs. A shared opinion amongst the informants is that allowing extensive technical requirement specifications to guide implementation-level design is destructive for the prospect of organizational change and digital innovation. Two informants from different partner organizations express the following arguments:

> [...] a challenge is to accept that a customer enters with 2500 detailed requirements. Instead, the customers should ask how our solutions can solve their overall needs and goals, and I fundamentally mean that this is a better approach when moving from something old to a new solution. (Board member, Partner 1)

> Those who make these requirement lists know the existing solution, and their existing processes exactly how they look today. That is all they know, and then they make thousands of requirements based on what they know. I think that this mindset regarding procurement is crazy. It is devastating to these processes. (Head of ERP department, Partner 2)

The typical starting-point of implementation-level design includes identifying and analyzing the user organization's high-level business goals (Figure 5.3). One example of an overall goal is where the company envisions to be in five years. The task of the partner is to materialize a roadmap for how to achieve such high-level business goals through close collaboration with top management. The roadmap creates a direction and defines specific objectives. Guiding the

process according to high-level business goals is for several reasons important for the prospect of digital innovation. First, as the partners emphasize, organizing projects in a manner that secures the flexibility and opportunity-space to combine and recombine software features is key. Second, high-level business goals guide the realization of designing a solution able to unify and align IT and business strategy in a holistic manner. Third, they enable the best use of generic software features. The partners stress the importance of initiating discussions to establish a shared understanding of the way forward in realizing the overall business goals. These discussions require heavy involvement of the user organizations' top management, and will serve as the point of departure for implementation-level design.

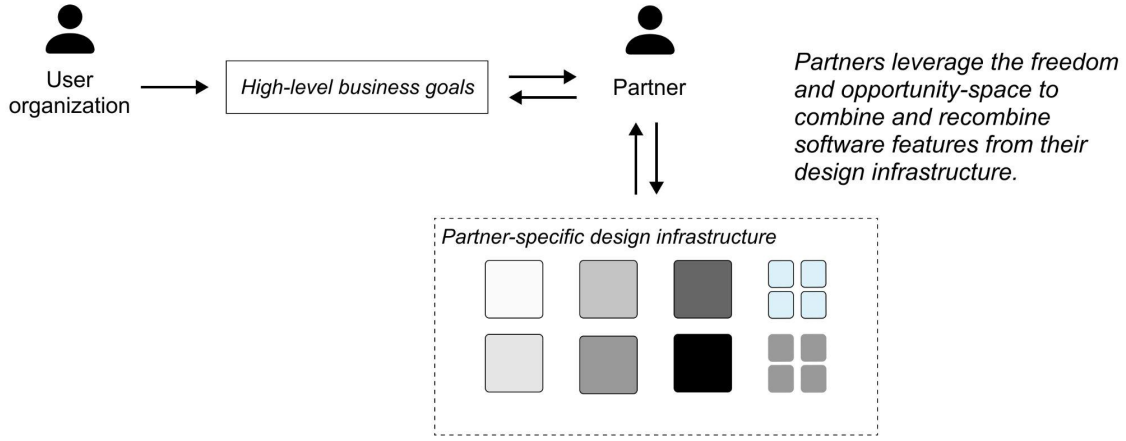

***Figure 5.3**: High-level business goals guide the process of implementation-level design.*

The top management are required to have an active role throughout the project. Digital innovation is both a cause of change and a result of change. All partners emphasize the structural implications of introducing new ES. They highlight that it requires top management to be onboard and progressive in change management initiatives in order to secure organizational impact. The partners have an active role in supporting top management in these endeavors.

The project structure has implications for the flexibility throughout the design process, limiting or enabling the potential for utilizing technology for new purposes. According to all informants, allowing for digital innovation during implementation-level design requires the role of the partner to expand beyond merely designing technology. Rather, they must have comprehensive business knowledge, which further emphasizes the importance of industry specialization.

Partners must assess how technological possibilities can merge with, and support, the changing of internal workflow that resonates with achieving high-level business goals:

> Those who know technology and understand the customers' business processes, the value chain they operate in, and that are able to apply this in a new way, are the ones that are now being invited into the boardrooms. Innovation processes are now being run where the goal is to do things in new ways, not to improve existing processes. That is innovation. (Head of ERP department, Organization 4)

5.6 Gaining access to strategic discussions

One aspect highlighted as important for digital innovation by the informants is whether the partner is part of the strategic discussions of the user organizations' business strategies and high-level business goals. This significant aspect of some partners' practices during implementation-level design distinguishes the more prominent partners from the less prominent. The partners that manage to gain this access are better positioned in understanding where to invest efforts regarding digital innovation. They engage in decision making and negotiate contractual agreements that provide them with increased leverage in implementation-level design. According to one informant, this represents a new role for partners that strengthens their capacity to attain digital innovation:

> Now we are talking about the whole shift from the old traditional partner to the new modern partner which is to a much greater extent a resource to support business development and business innovation in relation to meeting the market and customers. There is a whole new role these partners are taking in this innovation game. (Board member and senior consultant, Partner 1)

An important maneuver is to secure that the project is funded by the most significant budgets. One partner highlights that most user organizations have larger budgets for business and strategy, than for IT. Negotiating that the project is underlying strategic budgets is a powerful move to align the ES solution with strategies that can achieve high-level overall goals. The informants claim that the more aligned an innovation project is with the user organizations' strategies, the more reward will result for the organization as a whole. Furthermore, gaining access is described as a reinforcing mechanism for strengthening the partners understanding of how to create value. It enables them to approach digital innovation during implementation-level design in accordance with organizational strategy. The informants emphasize their

characterization of these types of close collaboration as partnerships, rather than a traditional customer-supplier relationship:

> We have heavily involved partnerships with our customers. We attend board meetings and next year's business development and what they need to do… We have a grand responsibility for them. (Board member, Partner 1)

5.7 Identifying strategic advantage

An important element for digital innovation is for partners to determine when to rely on custom development and when to utilize generic software features. This is instrumental for identifying where to utilize and direct efforts and financial resources to create value. The informants agree that while custom software features are a fundamental aspect of enabling digital innovation, it is undesirable to invest resources in building custom features for every need:

> [...] then we are discussing the 80/20 - Let's say 20 percent of the company is what makes you a leader in the market. How you do non-strategic purchases, however, is likely not part of it. Purchasing the pen you have in your hand - it doesn't have to be so challenging, nor does it require building custom functionality. That is the strength of SAP, that you can simply configure either an Ariba platform [SAP module] or purchase other methods where you can buy pens, PC screens, or detergent if you need to. And that handles invoices and that bit. You don't have to spend a lot of money on developing something that is really not a differentiating factor. (Head of ERP department, Partner 4)

These decisions turn into discussions on where to invest efforts in custom development. All the informants report that they design solutions that consist of partly generic and partly custom software features. However, identifying *where* and *why* custom software features are strategically important for the user organization at hand are critical questions during implementation-level design. The informants argue that most organizations have similarities that they consider to be non-strategic. Investments in custom software for these areas of a user organization will thus not provide them with added value. Consequently, generic software features are implemented in areas that are not imperative for strategic competitiveness:

> This is exactly the reason why one still wants package solutions as a basis. It is precisely this that you want to reduce on both development but also operation and maintenance of the parts of your business that can actually be handled by a ready-made solution. If you think further ahead in time, with cloud solutions that are delivered as a service - why in the world should a company in Norway spend money and time on

> further developing and operating a simple solution for whether it is payments, purchasing, inventory management or whatever it may be. You can get ready-made solutions that can do this for you, and they can do it cheaper because they can get efficiency and innovation through economies of scale because they have many customers which require the same. And then you can use your time, money, and innovation power in the areas where there is actually some differentiation. (Architect, Partner 4)

Being able to determine, identify, and predict where a user organization should concentrate their innovation efforts is a competence-intensive task for the partners. These are questions where the importance of the partners' specialization becomes accentuated. In order to do so, the informants argue the importance of sustaining a comprehensive knowledge of the user organizations internal processes, their value proposition, and in the services and/or products they offer. Simultaneously, the informants emphasize the role of deep understanding of the industry and specific business segment in which the organization operates in order to identify where it differentiates from its competitors. Attaining a focused specialization within such industrial boundaries becomes increasingly important for the partners in these matters, and emphasizes their role as consultants within both business and IT. The more prominent partners, who have access to strategic discussions and engage in decision making, will have an advantage in acquiring the necessary knowledge and competence. These partners will be particularly well positioned to identify strategic and competitive advantages that are potentially enhanced by digital innovation.

5.8 Sustaining implementation-level design over time

Many of the partners have engaged collaborations with user organizations where implementation-level design persists over many years. The partners that manage to sustain such collaboration often serve central roles in the user organizations, and have managed to gain strategic access. Establishing long-lasting collaboration appears to be characterizing for a partner's success, whereas the few partners who do not engage in long-lasting processes express this as a future ambition. It requires the partner to establish a relationship defined by trust, particularly by the user organization relying on their specialization:

> I had a meeting with the management of one of our customers last week where we discussed and created a shared strategy, what next year looks like, what their challenges are, and what their goals are. They are building a new storage unit for

> instance, so we know that has some impact on IT, and they want to create a new customer journey which also demands changes. This is the general direction on how we constantly work with most customers. It is an exciting situation to be in, but also very demanding because it is extremely dependent on trust in terms of the position we have in their organization. It is a pressure to deliver what they expect. (CIO, Partner 1)

Long-term implementation-level design processes are defined by these partners as particularly fruitful for digital innovation. They include carrying out continuous innovation projects where software features are tuned and altered as business needs evolve. The partners are thus conveniently positioned to assess relevance and potential as new technical possibilities are made available. Furthermore, the partners who build relationships of trust and are strategically involved over a long period of time is also to challenge the organization to do things in new ways, as exemplify with procurement processes:

> We often challenge the companies' procurement processes. They often run the classic state standard agreements that are linked to a type of waterfall approach. That is, the old approach and not the innovative agile approach. This is because they are more difficult to manage in a contractual way. What will this cost, when is it finished, and can we provide deliveries? An innovation process is not clearly defined in advance. You do not know exactly what the result will be, nor do you know exactly how long it will take or what resources you will use [...] Buyers do not like it. They want clarity, contract and two lines below the price. So we face some challenges in how the regime is handled. (Head of ERP department, Partner 4)

Partners who possess solid specialization within both IT and business, monitor the partner-specific design infrastructure, whilst successfully establishing close relationships have powerful tools in realizing digital innovation. They describe how projects are specifically organizing towards enabling implementation-level design to be an ongoing activity, in this case within the retail industry:

> [...] retailers in the Nordics have a lot of common processes, so let's see what is possible to reuse again and again, and rather focus on the other things. This way we get a customer base that is quite similar, and this is important in ensuring that we can aid them over time. (CIO, Partner 1)

5.9 Factors for organizing ES implementation for digital innovation

Based on the empirical findings, this final chapter summarizes the discussion above by highlighting four factors that have emerged as consistently important for partners organizing implementation-level design projects for digital innovation. Table 5.1 displays the four factors.

Cultivating a partner-specific design infrastructure

Partners are met with heterogeneous needs across the many user organizations. To accommodate these needs, they secure the necessary technical flexibility by cultivating partner-specific design infrastructures composed of generic software features from multiple vendors, and custom software features that partners have secured IP of from previous projects. This partner-specific design infrastructure continually evolves as its constituent vendors develop new software features that are made available in the various global design infrastructures, or when new custom software features are built. The partner-specific design infrastructure provides the partners with a wide range of generic and custom software features for combination and recombination across projects.

Conducting two-sided monitoring

As shown throughout the case analysis, partners operate in a competence-intensive environment where they must sustain a comprehensive understanding of the technological trends and opportunities, while effectively catering to diverse needs. The partners are dealing with technical capabilities and organizational needs that are in constant change. In order to sustain the necessary insights and a holistic understanding of technology and organizations, they continuously monitor these two evolving environments: the global design infrastructures and each individual user organization. By conducting two-sided monitoring, the partners can detect and assess if available software features are relevant to a particular need in a particular user organization. Digital innovation transpires from combinations and recombinations resulting from this continuous activity. It requires partners to be specialized. They not only need to be familiar with the internal matters in the user organization, but also with the industry it operates in, and with the software features that can best support the user organization in its industrial context. For this reason, two-sided monitoring becomes a more powerful tool if the partner manages to sustain long-term collaboration with a user organization.

Organizing projects based on high-level business goals

A shared opinion amongst all informants is the necessity of seeking to organize projects based on high-level business goals. The partners materialize a roadmap in collaboration with the user organization for how to achieve these goals. In contrast to the use of comprehensive requirements specifications, guiding the process by high-level business goals is important for digital innovation, because (1) it enables organizing projects in a manner that secures the flexibility and opportunity-space to combine and recombine software features, (2) it assures the realization of a solution that unifies and aligns IT and business strategy in a holistic manner, and (3) it enables the best use of generic software features. In addition, the partner´s close coupling with top management and its involvement in working out long-term goals, will enhance the prospect of establishing long-term collaboration.

Identifying the user organization's particularities for strategic advantage

As the case analysis accounted for, all informants approach implementation-level design by utilizing both generic and custom software features. Most organizations have similarities that all informants consider to be non-strategic. Generic software features are implemented in areas that are not imperative for strategic competitiveness. One challenge is to identify which areas are non-strategic. Another major challenge is to identify *where* and *why* custom software features are strategically important for the user organization at hand. These questions involve deciding where to utilize and direct efforts and financial resources to create value. These questions also relate to determining, identifying, and predicting where a user organization should concentrate their innovation efforts. The partners who manage to gain access to strategic discussions will be particularly well positioned to identify strategic and competitive advantages that are potentially enhanced by digital innovation.

Factor	Description
Cultivating a partner-specific design infrastructure	Partners cultivate partner-specific design infra-structures composed of generic software features from multiple vendors and custom software features from previous projects. The aim is to secure flexibility to combine and recombine a wide range of software features.
Conducting two-sided monitoring	Digital innovation transpires from combinations and recombinations of software features resulting from partners continuously monitoring two evolving environments: the global design infrastructures and the individual user organizations.
Organizing projects based on high-level business goals	The partners seek to organize projects based on high-level business goals to afford digital innovation and ensure a strategic direction where IT and strategy are holistically aligned.
Identifying the user organization's particularities for strategic advantage	Partners leverage generic software features to support needs that are similar across user organizations. They build custom features to provide novel value when particularities can provide competitive or strategic advantages.

Table 5.1: *Four factors for organizing ES implementation for digital innovation*

6 Discussion and Contribution

I started with the following research question: *How do partners organize ES implementation projects for digital innovation?*

I have addressed the research question through my analysis by identifying four factors that appear as consistently important across partners when organizing ES implementation projects for digital innovation: (1) cultivating partner-specific design infrastructures, (2) conducting two-sided monitoring, (3) organizing projects based on high-level business goals, and (4) identifying a user organization's particularities for strategic advantage.

The study has focused on examining implementation-level design as a context for digital innovation, from the perspective of partners.

I argue that the four factors identified offer a contribution to the body of knowledge on ES implementation as a context for digital innovation (Badewi et al., 2020; Berente et al., 2019; Elragal et al., 2020; Kharabe & Lyytinen, 2012; Lokuge & Sedera, 2018; Sarker et al., 2012; Sedera et al., 2016). Furthermore, it provides insight into the understudied context of implementation-level design by emphasizing the role of partners (Jæger et al., 2020).

This chapter consists of seven subchapters. In the first five, I discuss how the empirical findings extend related academic literature and contribute to our understanding of ES implementation as a context for digital innovation.

First, I propose a conceptualization of how digital innovation takes place during implementation-level design (6.1). Second, I discuss how project structure shapes the opportunity-space and flexibility for digital innovation (6.2). Third, I discuss technical flexibility as a prerequisite for digital innovation (6.3). Forth, I argue that organizing ES as design infrastructures enable partners to attain digital innovation (6.4). Fifth, I further discuss the importance of the partners' role in attaining digital innovation (6.5). Finally, I present a set of implications for the practice of ES partners, user organizations and ES vendors (6.6), before I offer four avenues for further research based on the contributions of this thesis (6.7).

6.1 Implementation-level design as a context for digital innovation

I started by defining digital innovation as the process, and the results, of combining and recombining digital components that enable change and create novel value in user organization. An important premise for digital innovation is consequently flexible technology that can be shaped and extended according to local needs, through combination and recombination (Nambisan et al, 2017, Fichman et al., 2014). Outcomes and results from such a process can thus either be digital or social as long as they are embodied in or enabled by IT, perceived as new, and pose significant change for the adopters (Fichman et al., 2014). As shown through the empirical findings, partners are positioned to facilitate various innovation outcomes by combining and recombining the software features located in their partner-specific design infrastructure in response to the needs of the many user organizations. The partner-specific design infrastructure is in constant movement as new software features are made available by the various vendors, and when custom software features are developed and included by the partner. To be aware of the evolving technical possibilities afforded by the software features available, the partners continuously monitor the global design infrastructures.

Simultaneously, they engage in long-term collaborations with user organizations and often sustain access to strategic discussions where they engage with top management. This is a deliberate strategy for the partner and makes them exceptionally well equipped to understand the user organization's needs, strategies, and future direction. Over time, the partners' specialized expertise within particular industries and business segments are aligned with the user organizations they interact with, and the software features available.

The partners facilitate digital innovation by paying close attention to these two independently evolving environments: the opportunities afforded by the software features available in the global design infrastructures, and the emerging needs of user organizations. I conceptualize the activity of monitoring these two environments as a *two-sided monitoring* process that partners consistently perform to effectively accommodate organizational needs, challenges, and opportunities. As portrayed in the case analysis, when a need emerges in a user organization, and the partner has a broad overview of possible technological options, the partner will be in a position to promote and propose more innovative solutions than the user organization itself would have been aware of. Figure 6.1 illustrates the activity of two-sided monitoring, consistently conducted by partners through implementation-level design. The activity of two-

sided monitoring involves the partners assessing whether emerging software features may be of value, depending on their knowledge of organizational needs acquired through monitoring.

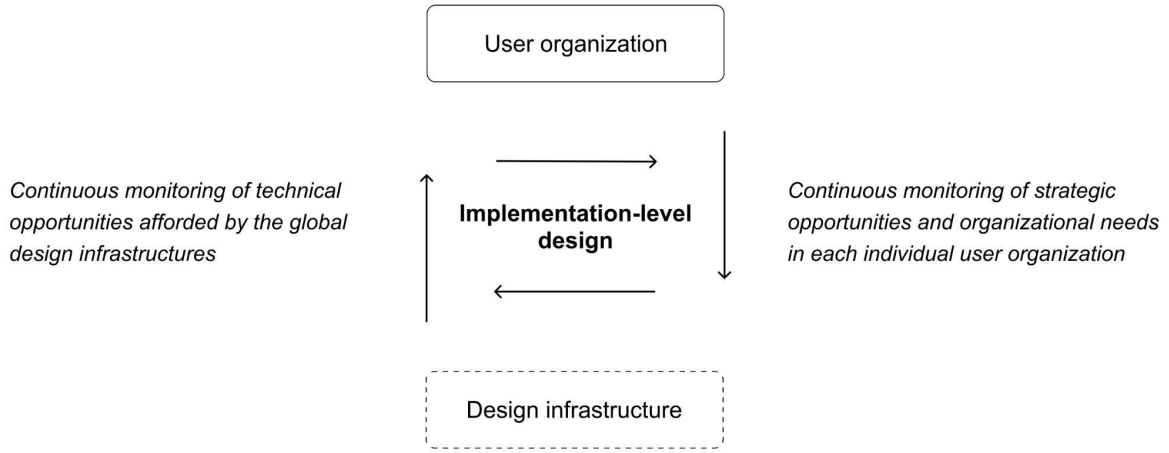

Figure 6.1: Partners consistently conduct two-sided monitoring for the prospect of digital innovation.

Digital innovation occurs if and when the partner assesses a software feature to be of relevance to a particular need or challenge in a user organization, through the activity of two-sided monitoring. In that case, the partner combines and recombines software features from the partner-specific design infrastructure with the existing ES of the user organization. These efforts may enable change, and create novel value for the adopting user organization (Henfridsson et al., 2018; Yoo et al., 2010). Two-sided monitoring enables long-term relationships between a partner and a user organization, where innovation projects are continuously run to respond to emerging needs. Digital innovation is a highly socio-technical phenomenon (Msiska & Nielsen, 2018), which in the context of implementation-level design involves an interplay between a partner, a partner-specific design infrastructure consisting of multiple global design infrastructures and custom software features, and a user organization.

The conceptualization of two-sided monitoring aims to contribute theoretically to the understanding of implementation-level design (Li & Nielsen, 2019). I argue that the conceptualization of two-sided monitoring extends this understanding by proposing *how*

partners attain digital innovation by leveraging generic software features to serve a wide range of possibilities when designing ES according to specific needs. By constantly being aware of the technological possibilities afforded by the various global design infrastructures, and of the operations and strategic goals of each individual user organization, partners can effectively map emerging and evolving IT capabilities with business opportunities. It aids in understanding ES design as a context for digital innovation in user organizations from the perspective of partners and their design practices.

6.2 Organizing for digital innovation

Extant literature has portrayed the process of implementation-level design as one that mainly involves changing the user organization according to the process flow and software features of the ES (Kallinikos, 2004). However, my study finds that partners seek to organize projects based on the user organization's high-level business goals when negotiating project structure, a move that implies technical flexibility to combine and recombine for digital innovation. Guiding implementation-level design according to high-level business goals is not a novel finding, and concurs with existing literature (Markus, 2004). However, it is emphasized by the partners as particularly significant for digital innovation during ES implementation. In order to realize change, the partners are dependent upon organizing for the flexibility to propose new solutions and workflow (Fichman et al., 2014). Negotiating such a project structure can present a great challenge for the partners. They have to balance the need for flexibility while ensuring predictability for the user organization (Li, 2021).

The partners report that ES represents large investments on the part of the user organization, and is often initiated by top management as part of an organizational change initiative (Markus, 2004). Enabling IT-driven organizational change thus requires "to work together with organizational managers and other specialists to design a technochange in which the IT part meshes with other changes to achieve desired objectives" (Markus, 2004). A large part of project negotiations during implementation-level design thus includes convincing the user organization of the collective efforts. This is one way that partners secure long-lasting collaborations. By constantly adjusting software capabilities to emerging needs in collaboration, in contrast to designing ES solutions according to comprehensive requirements specifications, digital innovation constitutes a permanently ongoing activity.

6.3 Technical flexibility as a prerequisite for digital innovation

The ability to combine and recombine is dependent upon the unique characteristics of digital components as malleable, reprogrammable, open, and distributable (Yoo et al., 2010; Nambisan et al., 2017). Or, that digital components hold an "ambivalent ontology" (Kallinikos et al., 2013), meaning that their scope, features, and value can continue to evolve and change over time (Nambisan et al., 2017). In other words, digital components inherently hold flexibility to be edited to produce specific outcomes, or to be changed when its designated purpose no longer provides value (Fichman et al., 2014). This corresponds well with what the partners intentionally keep in mind when organizing ES solutions capable of managing future growth in user organizations. They state that they organize implementation-level design projects to facilitate future growth and innovation, by emphasizing the establishing of a digital core for this specific purpose. By ensuring data capture that can be retrieved for present and future purposes it serves as a foundation for combination and recombination of software features. Furthermore, innovation projects with the aim of utilizing data from the digital core are continuously carried out in collaboration with the user organization. However, ES is portrayed in extant literature as inflexible. Here, the complexity of customer requirements and the need for technical flexibility to ensure diligent integration of software features has been problematized (Koch, 2007; Strong & Volkoff, 2010; Xu & Brinkkemper, 2007). This technical flexibility is argued to be compromised by the generic logic and nature of ES (Pollock et al., 2007). While acknowledging the complexity that characterizes the context of implementation-level design and of the broader subject of ES design in general, the perspective of these partners depicts a context with far greater technical flexibility. This offers a contrast to the portrayal of what packaged software has to offer in terms of the prospect for accommodating particular user needs (Koch, 2007; Strong & Volkoff, 2010; Xu & Brinkkemper, 2007). While facilitated by vendors through APIs and other knowledge resources, the partners largely ensure and provide technical flexibility themselves by cultivating partner-specific design infrastructures of features from several vendors. ES solutions designed by the particular partners studied in this thesis are thus never solely based on the configuration possibilities provided by a single vendor, in contrast to the portrayal in extant research (Koch, 2007; Pollock et al., 2007).

6.4 ES as design infrastructures

It is well established in influential studies that digital platforms have accelerated the opportunity space for digital innovation, also in the domain of ES (Foerderer et al., 2019; Rickmann et al., 2014; Staub et al., 2021; Wareham et al., 2014). An important element that enables the prospects for novel value to be generated is afforded by vendors pursuing platform strategies, opening up to external innovation (Foerderer et al., 2019). The generativity that these strategies enable is central for the findings of this thesis, and for ES implementation as a context for digital innovation (Li, 2021). These efforts have led to the organization of ES as design infrastructures (Li & Nielsen 2019; Li, 2021), providing vast amounts of generic software features and configurability for partners to exploit. In line with this, an ES ecosystem must encompass "the provision of highly complex and industry-specific services to customers that requires much more diligent integration of the ecosystem's complementary resources contributed by heterogeneous actors" (Staub et al., 2021). I see the roles, activities, co-creation, and resources transpiring from an ES as especially rigged towards implementation, making implementation-level design an important context for design and innovation. Limited attention has, however, been directed to how the digital innovations emerging from co-creation in ES platform ecosystems are exploited and organized in the context of implementation-level design. I argue that my findings contribute to addressing this gap. They show that the generativity provided by the widespread adoption of platform strategies is an enabling property for partners' design practices (Foerderer et al., 2019; Rickmann et al., 2014). As such, implementation-level design presents a context for professional IT design where partners' design practices involve utilizing generic software features in association with other efforts, in contrast to the design space being constrained within the possibilities provided by a single vendor (Dittrich, 2014; Kharabe & Lyytinen, 2012; Sommerville, 2008). This allows partners to organize implementation-level design according to the specific user organization at hand. Instead of the illustration of partners as someone who is tied to contributing with generic innovation on behalf of a vendor, they may affiliate with multiple ES ecosystems, similar to how ISVs 'multihome' (Venkataraman et al., 2018). They are to a greater extent detached from affiliating with one vendor, which emphasize their role as independent consultancies serving their own interests toward catering to the heterogeneous needs of user organizations (Jæger et al., 2020; Dittrich, 2014).

6.5 Emphasizing the partners role

Partner management is argued to be an important success factor for digital platform ecosystems in terms of operationalizing the platform strategies (Engert et al., 2021; Rickmann et al., 2014). The orchestrating activities of vendors have thereby gained much attention from existing literature (Rickmann et al., 2014; Foerderer, 2019). So far, research has predominantly been limited to how ISVs and partners contribute with generic services, expertise, and applications on behalf of a vendor. While the present investigation does not represent an implementation study in terms of reporting from an active implementation process, it still emphasizes important practices relevant to how it is organized. It does so by directing attention toward the design practices of partners, and more importantly toward how their efforts influence the potential for digital innovation during implementation-level design (Berente et al., 2019; Li & Nielsen, 2019b). There is a lack of studies that see this context from the perspective of those whose profession is to cater to a diverse set of user organizations, in contrast to vendors' responsibilities of serving the many (Pollock et al., 2007). Rather, "the complementor's [ISVs and partners] perspective, even though adapted by several more recent publications, is based on an abstract representation of the complementor, its characteristics are not considered on an individual level of analysis" (Schreieck et al., 2016). While acknowledging that there is more to digital innovation than the partners' practices, I argue that the four factors identified offer insight to the partners' role (Jæger et al., 2020) in technology design that fosters digital innovation during ES implementation (Berente et al., 2019).

Partners strategically shape their base of user organizations regarding what industry they operate in and cultivate a partner-specific design infrastructure that can best support their respective practices, making the partners well equipped to utilize technology in a way that supports the organizational objectives of each user organization. This is materialized through the activity of two-sided monitoring. The findings offer a novel perspective on how digital innovation takes place through the interaction between technology, partners, and user organizations. I thus argue that the four factors identified are relevant to research engaged with the nature and potential for digital innovation during ES implementation (Badewi et al., 2020; Berente et al., 2019; Elragal et al., 2020; Kharabe & Lyytinen, 2012; Lokuge & Sedera, 2018; Sarker et al., 2012; Sedera et al., 2016).

6.6 Implications for practice

The analysis offers three implications for practice. The first implication is aimed toward partners' practices by empirically identifying how prominent Norwegian partners organize ES implementation projects. It thereby points to four important factors that new or existing partners should consider when organizing projects in user organizations to attain digital innovation. It shows that the design flexibility during implementation-level design is afforded by partly generic-level design in ES ecosystems, and partly by partners' own endeavors at specializing and building custom functionality. The role of partners is thereby important in fostering digital innovation. A successful partner seems to invest in specialization and aim to cultivate individual design infrastructures that will provide them with the necessary flexibility to cater to specific needs. Furthermore, to assess when digital innovation efforts should be supported by generic features, and when resources should be invested in building custom functionality based on the particularities of a specific user organization. To identify the particularities, it is important to get access to strategic discussions and gain influence in the process changes. Part of the specialization should thus include a comprehensive understanding of both business and IT, and capabilities to align the two into holistic strategic directions on behalf of user organizations. Partners should thereby strive to recruit consultants who possess this competence-intensive and interdisciplinary expertise. The findings further emphasize the importance of negotiating project structure with a focus on digital innovation. Projects should thereby be organized according to the overall goals of a user organization, in contrast to exhaustive requirements specifications that merely mirror existing practice. The aim is to provide the space for two-sided monitoring which outcome might be unknown prior to negotiations. Finally, in order to succeed as a partner, one should strive to continuously emphasize two-sided monitoring, and as such be aware of the technological possibilities afforded by the global design infrastructures while paying attention to the evolving needs of user organizations.

A second implication is for user organizations' practice in terms of what it implies to hire a partner. Acquiring ES is not a one-time investment. It is rather a matter of constantly aligning strategy, IT, and practice, and being open to change and innovation in the organization. As prominent studies show (Bharadwaj et al., 2013; Markus, 2004), IT portfolio consisting of ES can be a powerful asset for any user organization. User organizations should accordingly seek

to establish long-term relationships with a partner that takes two-sided monitoring according to their specific and evolving needs seriously.

Thirdly, an implication for vendors is the insight into the context of implementation-level design. And more importantly, reporting from the perspective of partners which vendors are relying upon. I argue that this insight can potentially be valuable when offering boundary-, knowledge-, and generic resources to partners. The empirical findings concur with extant literature on some accounts. Vendors should seek to offer flexible resources with a high degree of configurability that affords design flexibility for partners set to conduct implementation-level design (Li, 2021; Rickmann et al., 2014; Foerderer et al., 2019). They should also consider mechanisms for profiting while allowing partners to integrate software features from their global design infrastructure with software features provided by other vendors.

6.7 Avenues for further research

In this thesis, I have examined ES implementation as a context for digital innovation by exploring how partners organize ES implementation projects. Through this thesis I have conceptualized how digital innovation occurs, and identified four important factors for how partners organize for it. These contributions provide a basis for several relevant avenues for further research:

1. The empirical analysis indicates that partners are provided with far greater technical flexibility during ES implementation than existing literature would suggest. Particularly, the prospect of cultivating partner-specific design infrastructures grants the partners with extended capabilities and freedom of choosing methods to support particular needs to attain digital innovation. However, sustaining a comprehensive understanding and overview of the technical possibilities of the various global design infrastructure, and assessing their relevance to emerging organizational needs hints at a highly competence-intensive exercise for the partner. A relevant avenue for further research is to investigate the necessary specialization and competence of the partners in greater detail.

2. The empirical findings offered in this thesis identifies important factors for organizing ES implementation projects for digital innovation according to the informants, who represent one important actor in such processes. Furthermore, the empirical analysis is

limited to the conceptualization of *how* innovation occurs as a result of two-sided monitoring. A relevant area for further research could be to extend this understanding by exploring the ways and means digital innovation materializes in user organizations, by including the account of other actors involved in ES implementation.

3. From the account offered in the analysis, project structure and contractual agreements are emphasized as influential when organizing for digital innovation during ES implementation. If the partners allow for extensive technical requirement specifications to guide the process of ES implementation, the space for combination and recombination to take advantage of technical and strategic possibilities is constrained. How the negotiations of project structure and contractual agreements may limit the potential for digital innovation were not visible in the present investigation due to not reporting from a specific project. The issue in this context, and a third avenue, is to explore whether these matters can be negotiated to afford digital innovation, while securing budgetary predictability for the user organization.

4. While the partners included in this thesis are not exclusively affiliated with one ecosystem, but with several vendors and their global design infrastructures, a third avenue for further research is to explore if and how two-sided monitoring applies as a fruitful conceptualization to understand how partners facilitate digital innovation in other ES ecosystems.

7 Conclusion and Limitations

In this final chapter, I offer an account of the limitations of this thesis before I provide a short summary of the thesis with some concluding remarks.

7.1 Limitations

In conducting the research of this thesis, I have attempted to understand a highly socio-technical context based on the intersubjective experiences of my informants. Limitations may be found in how I have conducted the research project. It has involved conducting various methods to enrich my understanding. I have also conducted new interviews with some informants when I have fallen short in my perception to minimize the likelihood of misinterpretation. However, I recognize that my study could benefit from including more informants representing more partner organizations. Additionally, it could also benefit from taking a more engaged role in exploring how digital innovation materializes as a result of two-sided monitoring. This is consequently suggested as an avenue for further research in chapter 6.

Limitations may also be found in interpreting one role involved in ES implementation. However, I argue that the empirical findings obtained through this research project provide insight into a previously understudied context. It contributes to new questions and relevant avenues for the field of IS by offering empirical findings that suggest a process with far more technical flexibility than prior research would suggest. Yet, I acknowledge that the findings are not exhaustive to all factors or activities that go into fostering digital innovation in user organizations. According to the general opinion of several studies, organizational characteristics are severely central when discussing the outcome and efforts that go into attaining digital innovation.

7.2 Conclusion

Through examining how partners organize ES implementation projects for digital innovation, this thesis contributes to the body of knowledge on ES implementation as a context for digital innovation (Badewi et al., 2020; Berente et al., 2019; Elragal et al., 2020; Kharabe & Lyytinen,

2012; Lokuge & Sedera, 2018; Sarker et al., 2012; Sedera et al., 2016). Providing insight into ES implementation as a plausible context for digital innovation is relevant due to its salient role in organizations, that are extensively investing in leveraging ES' promised benefits of increased performance, efficiency, automation, and integration (Berente et al., 2019; Elragal et al., 2020; Lokuge & Sedera, 2018).

In contrast to how major ES vendors promote their solutions, ES implementation is considered unfavorable for digital innovation by the dominant perspectives in IS research. The consequences of the argued inherently rigid logic ES poses on adopting user organizations' processes and workflow, have been subject to attention from many researchers (Davenport, 1998; Kallinikos, 2004; Strong & Volkoff, 2010; Vos & Boonsta, 2022). This portrayal views the potential for shaping and extending a flexible technology according to local needs as restrictive, thereby contradicting an essential premise for digital innovation (Nambisan et al., 2017, Fichman et al., 2014). Although an emerging stream of literature reports how vendors increasingly organize their generic solutions as platforms, the focus is limited to how partners are engaged in *generic* innovation (Rickmann et al., 2014). The role of partners in extracting and seizing the technological possibilities provided by the ecosystem in accordance with user organizations' heterogeneous needs (Li, 2021; Staub et al., 2021) has remained understudied (Jæger et al., 2020).

To contribute to the understanding of ES implementation as a context for digital innovation, and explicitly address the research question of this thesis, I have analyzed empirical findings from a one-and-a-half-year-long interpretive case study. Based on this analysis, I conceptualize how innovation occurs during ES implementation through what I coin a *two-sided monitoring process* of technical possibilities afforded by the generic ES as a design infrastructure and organizational needs. Furthermore, by analyzing what the informants consider necessary for enabling digital innovation during ES implementation, I have identified four factors that appear consistently important when organizing ES implementation projects for digital innovation. The four factors are: (1) cultivating partner-specific design infrastructures, (2) conducting two-sided monitoring, (3) organizing projects based on high-level business goals, and (4) identifying a user organization's particularities for strategic advantage. Based on this, I offer some implications for practice and offer four avenues for further research.

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Appendix 1: Enterprise Software Implementation as Context for Digital Innovation

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Enterprise Software Implementation as Context for Digital Innovation

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ENTERPRISE SOFTWARE IMPLEMENTATION AS CONTEXT FOR DIGITAL INNOVATION

Research paper

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Abstract

Many of the IT systems used in organizations are based on comprehensive generic enterprise software (ES) solutions. Accordingly, the process of implementing ES solutions, where generic features are configured and extended according to specific user needs represents a relevant context for digital design and innovation. Yet, besides a few exceptions, it remains little explored by IS research, and the dominant perspective on how generic solutions are implemented portrays a process with little flexibility to design and innovate digital solutions based on emerging user needs. In this paper, we address this gap by studying how innovation takes place during ES implementation. Our empirical analysis is based on data from the first phase of an ongoing case study, where we investigate the practices of five consultancy firms specialized in ES implementation. This paper contributes to the body of knowledge on ES implementation by proposing a conceptualization of how digital innovation takes place in the intersection between ES as a 'design infrastructure' and the needs of individual customer organizations.

Keywords: Generic enterprise software implementation, Digital innovation, Implementation-level design, Design infrastructure.

1 Introduction

Many of the IT systems used in organizations are based on comprehensive generic enterprise software (ES) solutions. ES are designed to fit generic rather than specific requirements (Strong & Volkoff, 2010). Following, the generic software features are configured and extended to meet specific user needs during implementation into specific customer organizations. On account of ES' prevalence, an increasingly relevant context for the design of IT involves implementing ES into particular organizations (Sedera et al., 2016). Yet, research is still limited on if and how digital innovation takes place in this context. In this paper, we refer to this context as implementation-level design (Li & Nielsen, 2019b).

The dominant perspective in IS literature portrays ES solutions as rigid and standardized organizational templates used across customer organizations (Koch, 2007; Pollock et al., 2007). The design and development of these solutions are consequently a matter of aligning heterogeneous needs, by persuading customer organizations to adapt to a standardized "best practice" software solution (Pollock et al., 2007; Wagner et al., 2006). Accordingly, the process of implementation-level design appears inflexible for local adaptation, which in turn has profound structural repercussions on organizational work processes (Davenport, 1998; Kallinikos, 2004).

However, in recent years, ES vendors' have taken steps towards opening up for innovation on top of their solutions by third-party actors (Foerderer et al., 2019; Wareham et al., 2014), increasing the potential for digital innovation during implementation-level design (Li, 2021; Roland et al., 2017). Platform strategies have extensively been pursued by vendors such as SAP and Oracle to facilitate external actors in developing functionality extensions and third-party applications (Foerderer et al., 2019; Rickmann et al., 2014; Sarker et al., 2012). Furthermore, implementation-level design is outsourced to partners that specialize in implementing and extending ES (Wareham et al., 2014). Vendors' focus is consequently shifted towards creating highly configurable, extendable, and flexible

solutions (Li & Nielsen, 2019b; Pipek & Wulf, 2009), as well as the resources ensuring access, knowledge, and competence necessary to exploit capabilities offered by the vendor (Foerderer et al., 2019; Rickmann et al., 2014), during implementation-level design.

While the line of investigation in prior studies has been geared towards examining the social dynamics and challenges experienced by customer organizations during implementation of ES, little attention has been directed towards the potential for digital innovation during implementation-level design (Berente et al., 2019). We see this as an important gap in research.

This paper addresses this gap by examining the following research question:

- How does digital innovation take place during implementation-level design?

We explore this question by reporting from the early stage of an ongoing interpretive case study (Myers, 1997; Walsham, 2006), where we have studied the design and innovation practices of five prominent consultancy firms operating as SAP Partners in Norway. This paper seeks to contribute to the body of knowledge on the nature and potential for (digital) innovation during implementation of ES (Badewi et al., 2020; Kharabe & Lyytinen, 2012; Lokuge & Sedera, 2018a; Sedera et al., 2016) with a conceptualization of how digital innovation takes place through what we coin as a two-sided monitoring process conducted by partners. Based on this, we propose five avenues for further research. The rest of the paper is organized in the following manner: First, we present existing literature on digital innovation in the context of ES design and implementation. Second, we describe our methods before we present our empirical case analysis. Finally, we answer our research question and discuss how it relates to prior literature before we conclude.

2 Related Research

In the following section, we define digital innovation, before we elaborate on two streams of literature that portray the potential for digital innovation in this context in two different ways.

2.1 Digital innovation

We define digital innovation as the process, as well as the result, of combining and recombining digital components that enable change and create novel value (Henfridsson et al., 2018; Øvrelid & Kempton, 2021; Yoo et al., 2010). This encompasses innovation that enhances physical product functionality with software capabilities (Yoo et al., 2010), that recombines collections of digital resources for generating value paths for individual users (Henfridsson et al., 2018), and that uses pervasive digital technology to create novel socio-technical entities (Yoo et al., 2012). One common trait in the literature on digital innovation is centered around digital innovation as afforded by generative technology (Henfridsson & Bygstad, 2013) and socio-technical relations (Msiska & Nielsen, 2018), concepts that refer to properties that enable novel combinations (Nambisan et al., 2017).

2.2 Implementation of ES

The dominant perspective on implementation of generic ES presented in IS literature portrays a process with limited potential for digital innovation. ES is frequently illustrated as inflexible for local adaptation and to have profound structural repercussions on organizational work processes (Davenport, 1998; Kallinikos, 2004; Mousavidin & Silva, 2017). In line with this view, the emphasis is on the misalignment between a contextually conditioned organization and the software's logic. Numerous researchers within the IS literature are thus occupied with examining the organizational impact of ES (Berente et al., 2016; Soh et al., 2000; Strong & Volkoff, 2010). These studies tend to be more concerned with what takes place *after* implementation (Sykes & Venkatesh, 2017; Williams & Pollock, 2009), where what seems like inevitable and inherent 'misfits' between what the software offers, and the needs of specific customer organizations are investigated (Mousavidin & Silva, 2017). Although we see this general critical tendency in research concerning organizational fit, studies have also explored vendors' pre-conditions for the design process; creating generic solutions that can be implemented across

heterogeneous organizations will reduce complexity for vendors in their futile efforts towards catering to all particular needs, as well as reduce cost on the individual level (Gizaw et al., 2017; Koch, 2007). Accordingly, a common strategy employed by vendors is to align a large potential customer base of user organizations to inform the generic design (Li & Nielsen, 2019b). Prior studies suggest that identifying what the generic core should consist of is a matter of aligning the abundance of needs (Pollock et al., 2007), in contrast to supporting the contextual differences. By persuading customer organizations to adapt to a standardized "best practice" workflow supported by a standardized software solution, differences in heterogeneous needs may be eliminated by making minimal software changes (Farhoomand, 2007; Wagner et al., 2006). This illustrates a tension in terms of changing the organizations to fit the software solution or vice versa.

One approach to reconciling the conflict between generic solutions and contextual conditions for organizational fit has in recent years been widely pursued. ES vendors have taken steps towards strengthening the technical flexibility of their solutions to support diverse needs (Foerderer et al., 2019; Wareham et al., 2014). By opening up their solutions and increasingly pursuing platform business models, innovations can arise by allowing external actors to develop functionality extensions and third-party applications (Li, 2021; Rickmann et al., 2014). These efforts present a value network of cocreation between different roles contributing to the generic design (Sarker et al., 2012). Hence the dependency of the relationship of vendors concerning their complementors and partners has become a more central perspective for investigation in recent years (Engert et al., 2021; Rickmann et al., 2014). Furthermore, facilitating design and innovation in customer organizations is outsourced to partners that specialize in implementing ES (Wareham et al., 2014). These partners are positioned in the intersection between business and IT, guiding their customers in technology-driven organizational change and performance improvement (Markus, 2004). Yet, the perspective of partners in addressing particular customers' emergent needs through implementation-level design remains to be investigated (Jæger et al., 2020), particularly in their role of facilitating digital innovation through the novel potential that platforms offer.

To summarize, we define digital innovation as the process of combining and recombining components that enable change and novel value. The dominant perspective in existing IS literature portrays implementation-level design as a context with limited potential for digital innovation. An emerging stream of literature reports how vendors increasingly organize their generic solutions as platforms. However, the focus is limited to how partners are engaged in *generic* innovation on ES platforms. A relevant gap remains in understanding how digital innovation takes place through interaction between a partner and a customer organization during implementation-level design.

3 Theoretical lens

As pointed out in existing research, design and development of ES are distributed across organizational boundaries (Dittrich, 2014). To analyze design and development activities involved in the implementation of ES, we employ a conceptual framework from Li and Nielsen (2019). The framework describes two key types of design processes, involved in making ES usable and relevant to a customer organization.

3.1 Design on two levels

Vendors of ES are met with diverse needs when attempting to develop functionality that is perceived as relevant to a diverse set of customer organizations (Li & Nielsen, 2019b; Soh et al., 2000). While one common approach involves strategies for aligning the needs of the customer organizations to inform the generic design (Gizaw et al., 2017; Pollock et al., 2007), developing solutions that can be customized, configured, and tailored by actors "closer" to the actual use context is another well-established strategy (Baxter & Sommerville, 2011; Pipek & Wulf, 2009). Accordingly, vendors' efforts to facilitate the external actors in accessing the resources necessary to do so are strategically important in innovation networks such as enterprise platforms. Part of the strategy involves creating highly configurable, extendable, and flexible solutions (Li & Nielsen, 2019b; Pipek & Wulf, 2009). Furthermore, it involves designing boundary resources that enable and control the development of extensions or 'apps' to build

novel functionality and user interfaces (Foerderer et al., 2019; Rickmann et al., 2014). We adopt the term "generic-level design" (Li & Nielsen, 2019b) to refer to design efforts aimed at developing generic software features and other resources relevant to multiple customer organizations. These efforts encompass the magnitude of configurability, creation of resources, and flexibility of components (Pipek & Wulf, 2009). Accordingly, pre-conditions afforded by the generic-level design define the flexibility, the starting point, as well as the limitations, for the process of implementing the software into particular organizations (Sommerville, 2008). We refer to the latter process as "implementation-level design" (Li & Nielsen, 2019b).

We refer to the collective resources built through processes of generic-level design as a 'design infrastructure' (Li & Nielsen, 2019c). These resources include generic software features, adaptation capabilities, and resources that build capacity and support to leverage these. The design infrastructure provides a basis for implementation-level design to configure and extend the generic features according to the needs of specific customer organizations (Li, 2021).

4 Research approach

We report from the first phase of an ongoing interpretive case study (Myers, 1997; Walsham, 2006), where we thus far have conducted six in-depth interviews with consultancy firms operating as SAP Partners in Norway. We will briefly introduce the software solution, its vendor, and associated partners, before describing our methods for data collection and analysis.

4.1 Case - Norwegian SAP partners

Our empirical basis is a study of the practices of one important type of actor within the SAP ecosystem. SAP is one of the largest vendors of ES and has been dominant in this domain for decades. They deliver three distinctly different ES-suites (SAP S/4 HANA, SAP Business By Design, and SAP Business One), with their SAP S/4 HANA suite being central in their current strategic investment. SAP is a relevant actor for investigation in this context, due to its market position. SAP has a significant apparatus of partners. SAP has created an apparatus of partners (approximately 4,500 partners globally) to which they have outsourced the task of implementation-level design. The perspective of these partners is the object of inquiry in the present investigation. The partners are governed through strict demands for continuous certifications and are facilitated through extensive resources and technical flexibility. SAP's strategy has been to create a wide range of standardized software solutions, each aimed at supporting an industry-specific segment. Accordingly, a partner is often specialized within one or few industry segments to manage the vast complexity of the expertise needed within each segment.

The partners of focus in our study all have significant experience and expertise with SAP implementation and adoption of SAP in their customers' organizations. These firms are specialized within retail and wholesale in the Norwegian business sphere and play the role of SAP partners as members of SAPs PartnerEdge program.

4.2 Data collection and analysis

We initiated the research project with an interest in the process of implementation-level design, and how it was enabled and constrained by generic resources. Our focus on design and innovation further developed through abductive cycles of empirical data analysis and investigation of existing academic literature. We have conducted six in-depth semi-structured interviews, illustrated in Table 1. The interviews were conducted with members with varying roles and positions in five consultancy firms operating as SAP partners, and with one ES-expert who advises customers in ES implementation across partner organizations. There are currently thirty-one SAP partners operating in Norway, and our informants were partly chosen through SAP's websites, and partly from recommendations that appeared during interviews. Our initial approach to the data gathering process was to investigate how SAP facilitates partners in their implementation efforts. As data was gathered, digital innovation became a recurring and consistent theme that emerged from the data. Our focus was consequently shifted to how

partners facilitate innovation in their customers' organizations. The continuing process involved identifying the partners' practices during implementation-level design, what tools and resources they are leveraging from the design infrastructure, how they cooperate with their customers, and how they communicate with SAP as the vendor of the solution they work with. The analysis was continuously carried out by using the concepts of generic- and implementation-level design to frame our understanding of where, and by whom, design activities are performed. Inductive cycles were then conducted in light of this conceptual framework as new insights were acquired. This was carried out by categorizing the empirical data into abstract concepts that captured the activities of the implementation-level design process that could be applied across partners, and how and what flexibility these activities depended on to cater to specific needs.

Position	**Number of informants**
Leader in a partner organization	2
Department manager in a partner organization	2
ES author, conference host, and expert in the Norwegian market	1
Developer in a partner organization	1

Table 1. Positions and numbers of informants.

5 Case analysis

We now turn to our analysis of implementation-level design as a context for digital innovation. We begin by looking at how implementation-level design unfolds to cover the activities in the process that shapes the potential for digital innovation.

The process of implementation-level design is initiated through negotiations regarding the scope and scale of a project. This occurs during the procurement process, which will be leading for the following design and construction of the solution(s). A typical implementation-level design process starts when the partner is awarded a contract with a customer. The customers' point of departure for hiring a partner is preferably motivated from a business development point of view. They might enter with a business angle as to how to meet the changing needs of the market they operate in, as well as how their services are expected to be exposed. The partner's task is to meet strategic opportunities and goals with technological innovations. The aim is to build a solution that possesses the capacity to take advantage of novel innovations, based on SAP and the technological opportunities afforded by the design infrastructure. While partners' practices differ, we highlight five activities of the implementation-level design process that are identified in our empirical investigation as important and general across partners and projects. These are illustrated in Figure 1 and are used to structure our analysis. These steps can reoccur, often as a result of new innovation opportunities, in various order, and may also take place simultaneously.

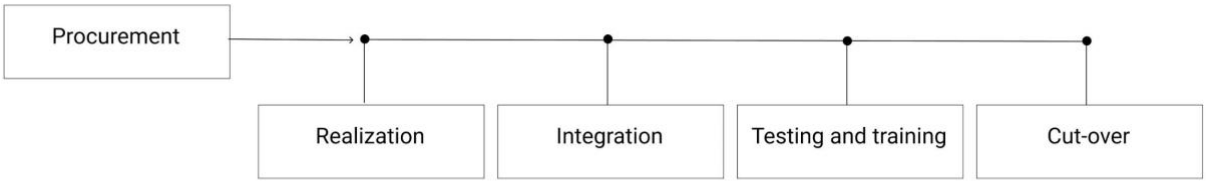

Figure 1. Key activities of the implementation-level design process.

5.1 Procurement

What we term procurement comprises the tender process where initial negotiations take place. Normally, the procurement process involves various partners competing in gaining the customer's project. It is vital for the partner to be competitive in terms of budget. Here, solutions from earlier projects may be used to showcase a specific proposition as to how to solve the challenges and support organizational needs. Customers have two main approaches when choosing a partner. They may either have a comprehensive requirement specification, or an outline of their main strategic organizational objectives. The latter approach gives the partner a greater space for using the generic technological possibilities part of the design infrastructure to solve the customer's issues. As mentioned by a leader in one partner organization, "*This is way more modern, and one does not limit ourselves to the present situation but opens up for using technology for real innovation. Not just smaller adjustments, but real innovation".* Furthermore, the procurement process ends with negotiating the overall estimation of cost and development time. The chosen approach and results of the negotiations have repercussions for the flexibility throughout the design process, limiting or enabling the space for adjusting the solution based on organizational needs.

5.2 Realization

The realization activities involve designing and constructing the software solution. The starting point of this activity involves using a standardized solution, or a template from an earlier project, as a base for localizing the software to fit the needs of the particular organization. The flexibility to localize the generic solution is provided by means of one or a combination of three alternative approaches:

1. Configuration - setting standard parameters.
2. Customization - changing the source code.
3. Building or using third-party extensions (apps).

The existing organizational business processes are reviewed individually in collaboration with the customer. The partner investigates whether the needs may be accommodated through the existing configuration possibilities. However, as one informant issued, "*I have never experienced a project where everything can be solved solely based on the configuration possibilities. They can never solve all obstacles".* These partners manage large customers, often unwilling to settle for a standardized solution. The flexibility to solve these customers' needs by tailoring the solution initially depends on:

1. The customer's willingness or ability to pay for the expenses of tailoring.
2. Whether the implemented solution will rely on an on-premise or cloud solution.

An on-premise SAP S/4 HANA solution offers nearly unlimited flexibility for tailoring the solution to fit the particular organizational needs and is built by creating a unique program library where the program code of the core is overridden by custom code. The expense is however greater in terms of maintenance regarding the task of operating the software and is often fit for large customers in need of the reliability and security this model offers. Meanwhile, SAP S/4 HANA Cloud consists of a standardized configurable core, lowering the operational cost and the maintenance cost of new features and updates. This choice will accordingly affect the content and tasks of the continuing partnership. The core of the cloud solution is shared between multiple customers, hindering the possibilities for customization. However, the partner generally avoids changing the source code of the core systems, mainly consisting of parts that handle transactions. As one informant points out, "The core is more or less tight and as for SAP, the core is highly flexible in terms of their vast richness of configuration possibilities". As such, the core may be configured within the premises set by SAP to be cost-effective regarding maintenance efforts. As articulated by a partner, "The point is that innovations are released every day, or every week and we have to be able to handle them. This is the reason why we can't change the source code, and if we do so, novel innovations become meaningless". Accordingly, partners need to build a solution that can handle the iterative innovation requirements. They do so by building new or

identifying and retrieving existing extensions. The set of resources that the partner has available during the construction of a solution, which we refer to as the design infrastructure, can be categorized into:

1. Functionality, boundary resources, and documentation developed at the generic level and offered by SAP.
2. Extensions developed and distributed in the ecosystem of certified SAP complementors.
3. Options and resources for building extensions (The UI library SAP Fiori, SAPs programming language ABAP, APIs, boundary resources, documentation, and learning material).

Extensions are dependent on a rich and well-documented API, allowing, and enabling flexibility for partners to exploit technological innovations and merge them with organizational needs. As reflected on by an informant, "*I would say that the vendor that offers the richest, most well-documented, and accessible API-capacity also provides the biggest opportunity-space for innovation, because they give their customers unlimited opportunity space to connect whatever it may be of pre-composed and self-developed extensions".* Figure 2 illustrates how resources from the design infrastructure are localized through implementation-level design. Partners need to be aware of, navigate, and consistently monitor these technological innovations and possibilities afforded by the design infrastructure, to effectively support their customers through this process.

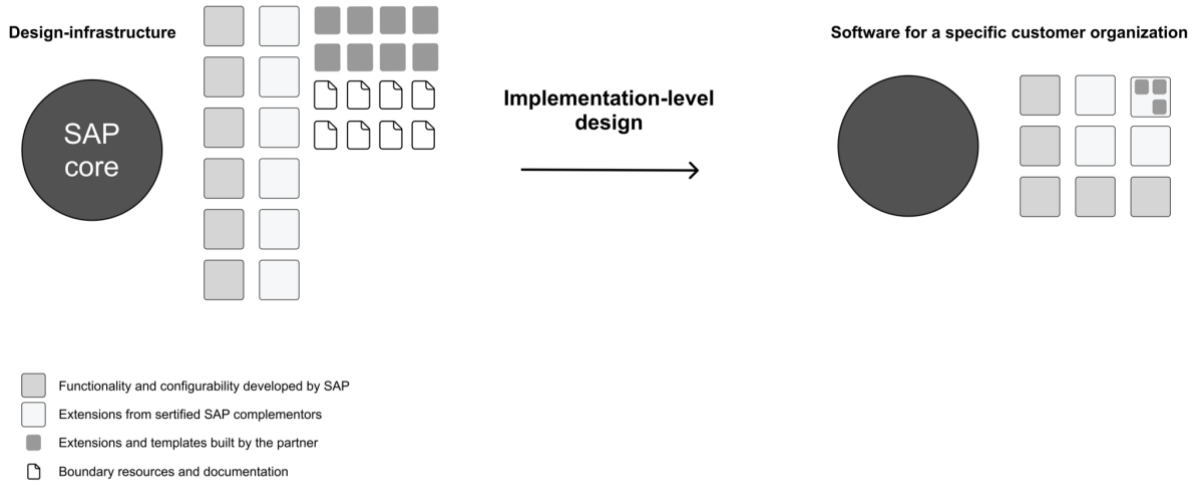

Figure 2. Resources from the design infrastructure are localized through implementation-level design.

5.3 Testing, training, and cut-over

Before the solution can be released, all functionality supporting individual business processes needs to be tested. Testing and training is a joint task between the partner and the customer. Some partners provide an educational program including an exam that the end-users need to take before the solution can go into use. Sufficient staff training is a critical success factor to minimize the risk of the inevitable organizational changes in the existing practices. One central element at this stage involves the partner preparing the customer for what's to come concerning expectations of increased turnover. As one partner puts it, "*It gets worse before it gets better [...] It is common with a dip in productivity before it goes very well after a few months".* It is also vital to create a cultural mindset for new ways to work, among the customer's employees.

Once all processes are tested and sufficient training is completed, all prior data from old systems are transferred to the new solution before going into the cut-over phase. The customer now has a fully integrated solution ready for use, and a platform with robust systems with capacity and capabilities for future expansion.

5.4 Continuous implementation-level design

For some customers and projects, the process of implementation-level design may last through the entire life-cycle of the solution. One partner has worked with a market-leading company within its business segment for a decade, constantly aware of their emerging business needs while monitoring the design infrastructure for relevant technical solutions. As the partner reflects regarding their cooperation with this customer:

"*They demand daily innovation releases. Now we don't do that daily, we do it weekly because new solutions must be tested first, but it means that we release new innovations consecutively all the time. And that is because this technology makes that possible",* and "*When we work with [customer organization], we are concerned with how [customer organization]'s customers experience things [...] and we are occupied with analysis, and how to succeed regarding the end-customers".*

Additionally, the capacity for innovation is dependent on the customer's willingness and ability to change, either within the limits of the technological opportunity space of SAP or to new features potentially beneficial for the customers' organization. Therefore, a comprehensive task is for the partner to negotiate with the customer, and either try to justify the cost benefits of choices made or extensions to be added, or to explain why it is wiser to stick to the configuration possibilities provided in the design infrastructure. The partner plays an important supportive role through this decision process. The main elements in this role include facilitating innovative solutions by possessing comprehensive knowledge and competence on the one side, in the customer's industry segments and organizations, and on the other the technological opportunities. As exemplified by a partner, *"We try to understand the intention behind a need, how the customer works, and provide input on how to solve an issue. We have for instance worked with a customer who needed to inspect various objects and needed an inspection plan. Instead, we proposed that they should use sensor technology to count the number of visits, and the number of tremors so that they could inspect when the sensor had counted a fixed amount. This resulted in innovation for the customer because they could go out to inspect less often, and when needed".*

To summarize, we have examined the process of implementation-level design through the perspective of the partner, by exploring their role in realizing ES potential for digital innovation in individual customer organizations and their local practices. We now turn to the discussion.

6 Discussion and Conclusion

We started with the following research question: How does innovation take place during implementation-level design?

We will explicitly address and discuss our research question by proposing a conceptualization of how digital innovation takes place during implementation level-design, a context which the dominant perspective within IS literature portrays as unfavorable for digital innovation (Strong & Volkoff, 2010). Based on our conceptualization, we will define five avenues for further research.

6.1 How innovation takes place

We adopted the definition of digital innovation as the process and the result of combining and recombining digital components that enable change and create novel value (Henfridsson et al., 2018; Øvrelid & Kempton, 2021; Yoo et al., 2010). We have shown through our case that implementation-level design is a professional software development context with potential for digital innovation through combining technological possibilities available within a design infrastructure of generic resources to respond to organizational needs that create novel value in the customers' organizations. We see digital innovation as a socio-technical phenomenon (Msiska & Nielsen, 2018), where partners serve as a generative property aimed at realizing the possibilities and potential that are located partly in the technology, and partly in the organizations where the technology is applied. The partner is positioned to bridge the gap between technological possibilities and the emerging needs of specific customer organizations. They do so by consistently monitoring, on the one hand, the technological opportunities

afforded by the design infrastructure, and on the other, the evolving business needs and opportunities of each of their customers. We conceptualize this process as a two-sided monitoring process that partners consistently perform to effectively cater to their customers' organizational needs and challenges (illustrated in Figure 3).

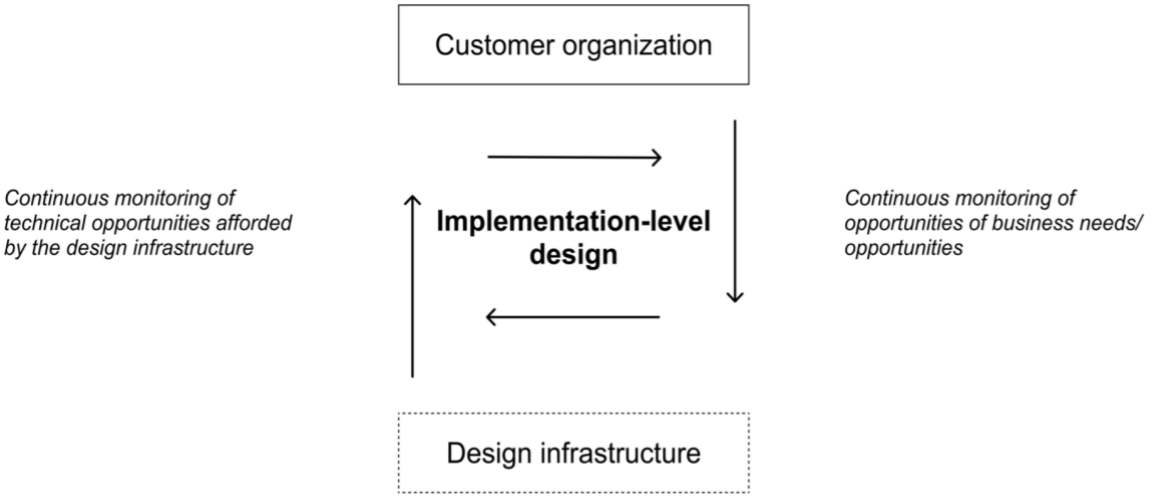

Figure 3. Digital innovation during ES implementation takes place through a two-sided monitoring process.

Digital innovation takes place when the partner combines and recombines digital components from the design infrastructure in response to particular user needs through the process of implementation-level design. This activity is motivated by customers' challenges and needs and aimed at solving them through creating novel value when new functionality is introduced in the customers' organizations. An important element that enables the prospects for novel value to be generated is afforded by vendors pursuing platform strategies, opening up to external innovation (Foerderer et al., 2019). This requires the necessary flexibility that APIs and technical resources provide (Wareham et al., 2014). The partners utilize the flexibility afforded by the platforms to build specialized solutions that fit their customers' contextually conditioned needs. It is well established that platforms have accelerated the opportunity space for digital innovation, as shown in influential studies (Foerderer et al., 2019; Rickmann et al., 2014; Wareham et al., 2014)**.** However, the generativity that they provide is central in the present investigation regarding the potential for implementation of ES to foster digital innovation (Li, 2021). While acknowledging the reported issues in ES research, we may also emphasize the opportunity space emerging from novel technology and outsourcing of design and innovation (Roland et al., 2017). The opportunities for combinations and recombinations afforded by the generative technology capacitates localization of ES to contextual conditions. Our findings contradict the portrayal of these solutions as rigid packaged solutions incapable of local adaption (Koch, 2007; Strong & Volkoff, 2010; Wagner et al., 2006), and supports the view of realizing ES as an enabler for digital innovation (Badewi et al., 2020; Kharabe & Lyytinen, 2012; Lokuge & Sedera, 2018a; Sedera et al., 2016).

6.2 The partner as an innovation facilitator

Given a flexible design infrastructure, the process of implementation-level design evolves into a relationship of close interactions between a partner and a customer, where emerging needs are transformed into technological solutions that require significant effort from the partner. Partners are presented with a rich environment of socio-technical components from the design infrastructure, enabling capacity and capabilities to build specialized solutions for individual customers. However,

navigating this abundance of resources demands new forms of competence and skills of the partner (Venkataraman et al., 2018). A vast selection of technological possibilities needs to be translated into organizational needs. A prerequisite is for the partner to possess comprehensive knowledge of the business segments their customers operate in. Partners tend to specialize within one or a few business segments to completely handle the complexity of this task. The design infrastructure constantly evolves with features and functions, providing possibilities that customers need to respond to. The continuing role the partner plays throughout the enduring partnership with each customer involves assessment of incoming and available options provided by the design infrastructure, and if and how these are to be assessed within the scope of specific customers' projects to foster innovation.

6.3 Avenues for further research

In this paper, we have examined and identified general elements of how innovation takes place through implementation-level design. Particularly, our analysis highlights digital innovation as emerging through a two-sided monitoring of the design infrastructure and the customers' organizational needs. The aim is to seize both strategic and technological opportunities that provide novel value to the customer organization at hand. Our findings provide a basis for several relevant avenues for further research:

1. Our analysis hints at a highly competence-intensive exercise for partner organizations, who must sustain a comprehensive understanding of both the possibilities that lie in the design infrastructure, and the emerging needs of the many customer organizations they serve. A relevant avenue for further research is to explore the competences that are needed to successfully manage such processes.
2. A second avenue would be to study specific ES implementation projects, where the two-sided monitoring process conceptualized in this paper can be examined in greater detail. While this paper addresses *how* innovation takes place, a relevant area for investigation would be the *ways* and *means* by which digital innovations materialize, and what is required from the involved parties.
3. As our analysis has illustrated, there is a close collaborative relationship between partner and customer. Questions arise as to the particular elements in that relationship from the customer's perspective. Our empirical insights suggest that the role of the customer requires an organizational culture that fosters the ability to change, adapt and interact adequately with new innovations. Hence, a relevant third avenue would be to investigate the customer's role in the implementation-level design process in terms of preconditions, competences, and particular actions.
4. From our analysis we see that the way the procurement process is structured bears consequences for the ability to innovate. If defined through extensive requirement specifications the space for novel combinations of digital possibilities and the potential for taking advantage of strategic prospects is constrained. The issue in this context, and a fourth avenue for further research, would be how procurements may be negotiated in such a way that they afford openness for innovation, while avoiding budgetary unpredictability for the customer.
5. Our conceptualization highlights a two-sided monitoring process conducted by the partner. A possible fifth avenue may address questions regarding the scope, range, and nature of the efforts, on the part of the ES vendor, to support the partner in their monitoring activities of the design infrastructure, and to provide them with opportunities by means of various knowledge boundary resources (Foerderer et al., 2019).

6.4 Contribution and Concluding Remarks

In this paper, we have explored the practices of five partners to identify how digital innovation takes place during implementation-level design. The contributions of the paper consist of, on the one hand, our empirical insights into an increasingly relevant context of IT design, and on the other, a

conceptualization of digital innovation as the result of a two-sided monitoring process conducted by partners to build specialized solutions for individual customers. Based on our conceptualization, we have proposed five avenues for further research. We argue that our conceptualization is relevant for, and contributes to, research engaged with the nature and potential for digital innovation in ES implementation (Badewi et al., 2020; Kharabe & Lyytinen, 2012; Lokuge & Sedera, 2018b; Sedera et al., 2016).

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