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Enhancing Business-to-Business Relationship Value Using Service Digitalization – Opportunities and Challenges

Thomas Alexander Martin

A thesis submitted in partial fulfilment of the requirements of
Sheffield Hallam University
for the degree of Doctor of Business Administration

December 2022

CANDIDATE DECLARATION

I hereby declare that:

I. I have not been enrolled for any other award of the University, or other academic organisation, whilst undertaking my research degree.

II. None of the material contained in the thesis has been used in any other submission for an academic award.

III. I am aware of and understand the University's policy on plagiarism and certify that this thesis is my own work. The use of all published or other sources of material consulted have been properly and fully acknowledged.

IV. The work undertaken towards the thesis has been conducted in accordance with the SHU Principles of Integrity in Research and the SHU Research Ethics Policy.

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“It’s not a faith in technology. It’s faith in people.”

(Steve Jobs, 1994).

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ABSTRACT

Technological developments of the past two decades in the form of digitalization have tremendously changed how Business-to-Business (B2B) services are built, delivered, and consumed, offering new ways of creating value. Although digitalization has been common for quite some time, academic and practical engagement in this field accelerated recently, as the restrictions of the COVID-19 pandemic laid a path for digital to become the 'new normal'.

Digitalization is an indispensable element both today and in the future business environment. Despite the availability of technology, opportunities for value enhancement, and greater willingness of business customers to engage in digital formats, the adoption of digitalization in B2B services remains highly variable throughout sectors, service fields, and firm sizes. Explanations for this are numerous, wide-ranging, and include the growing complexity of B2B services; significant failure rates of digitalization projects, as high as 90%; and the fact that investments in digitalization often do not deliver the expected return on investment, an effect known as the 'digitalization paradox' (Gebauer et al., 2020; Ramesh & Delen, 2021).

Taken together, these factors make B2B service digitalization a highly interesting but challenging field for both practice and academia. Therefore, this thesis aims to shed light on the field of B2B service digitalization by providing in-depth insights into the service digitalization avenues in which B2B companies can engage, the value that is generated, and the corresponding challenges to be considered. In detail, three research questions (RQ's) are addressed:

- What is the potential of service digitalization in B2B relationship value management?
- What factors influence the value in practice perception of service digitalization in B2B relationship management?
- How do B2B companies manage service digitalization projects in practice, and what are the potential challenges and learnings?

Building on a literature review of key themes, qualitative research based on semi-structured interviews was undertaken in two stages. In stage one, latest in-practice knowledge from eight consultants in the B2B digitalization space was gathered. In stage two, insights from two corporate B2B firms were analysed in two case studies, with 17 key informants, who have engaged in different business service digitalization activities to increase relationship value.

Two service digitalization avenues were created to lift value, one based on improvements in efficiency, the other on enhanced effectiveness. Propositions are presented to enrich service digitalization research in the field of B2B digitalization influence factors, cost- and benefits categorization, and programme management elements. In addition, a set of challenges and corresponding learnings are proposed along six dimensions (Vision, Business Model, People, Technology & Data, Change Management & Financial Aspects).

A service digitalization relationship value enhancement framework is proposed that links service digitalization, relationship value, and technology adoption theory in B2B services. In addition to real-life insights from the case studies, this framework can be used by practitioners to better sell, plan, and steer their service digitalization activities in B2B services.

Keywords: *B2B service digitalization, relationship value, technology adoption, digital servitization, efficiency, effectiveness, expert interviews, case studies.*

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
ARA	Actor-Resource-Activity
B2B	Business-to-Business
B2C	Business-to-Consumer
B2G	Business-to-Government
CAPEX	Capital expenditures
CDO	Chief Digital Officer
CEO	Chief Executive Officer
CESE	Cost Effective Service Excellence
CO.	Company
DBA	Doctor in Business Administration
DTS	Digital Transformation Strategy
EC	Electronic Commerce
ERP	Electronic Resource Planning
FMCG	Fast Moving Consumer Goods
GDP	Gross Domestic Products
GDPR	General Data Protection Regulation
ICT	Information and communication technologies
IDT	Innovation Diffusion Theory
IHIP	Inseparability, Heterogeneity, Intangibility, Perishability
IMP	Industrial Marketing and Purchasing Group
IOT	Internet of Things
IVF	Interactive Value Formation
IT	Information Technology
MBS	Munich Business School
MVP	Minimum Viable Product
NGO	Non-Governmental Organization
OBR	Organic Buying Relationships

OECD	Organisation for Economic Co-operation and Development
OPEX	Operational expenditures
PSS	Product Service Systems
RBV	Resource Based View
RER	Routinized Exchange Relationships
ROI	Return on Investment
RQ	Research Question
SCM	Supply chain management
SHU	Sheffield Hallam University
SIM	Subscriber Identity Module
SST	Self Servicing Technology
TAM	Technology Acceptance Model
TBO	Transactional Buying Operations
TOE	Technological, Organizational, Environmental Theory
TQM	Total Quality Management
UPS	United Parcel Service

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1 INTRODUCTION AND BACKGROUND

1.1 Business-to-Business in Times of Digitalization

Technological developments of the past decade in the form of digitization, digitalization, and digital transformation have fundamentally changed the way products and services are designed, delivered, and consumed as well as the interactions that happen in a B2B environment (Arli et al. 2018; Barrett, 2015; Ritter & Pedersen, 2020a). The use of technological developments to maintain and enrich existing products and services as well as the relationships that underlie these factors is an accepted element of successfully competing in a B2B market space characterized by high levels of globalization, competition, commodification, and consumerization (Lilien, 2016; Nayak et al., 2021). What once was regarded as important has become even more critical in business today, when personal interactions are restricted due to the COVID-19 pandemic having possible longer-term implications that are currently reviewed in academia and practice (Alshater et al., 2022; Chernoff & Warman, 2022). All branches and sizes of companies in all geographic areas have been touched, including the consumer sector, demonstrating that digital technologies are becoming an indispensable basic need for business continuity, changing B2B buying behaviour as well as underlying relationships (Ritter & Pedersen, 2020b; Schilirò, 2020).

A prominent example of such digital developments in the service sector in recent years is IBM, a multinational technology company, where the service turnover share rose from 40% to 64% within the past 10 years (IBM, 2019). Others are McKinsey, one of the top international consulting firms, which offers a 100% digital consulting self-service product called McKinsey Solutions (McKinsey, 2020a), and Cemex, a multinational construction material company, which provides a fully digitalized end-to-end service platform from pre-sales consulting to delivery to their customers, called CEMEX-GO (Cemex, 2020). All three examples demonstrate that, with the help of technology, services that once were delivered exclusively in person are now supported or fully substituted

by digital service applications that claim to offer superior customer experience, optimized cost–benefit ratios, and totally new business opportunities. Within practice and academia this has led to a series of engagement often summarized under the umbrella terms of digitization, digitalization, digital transformation, and digital servitization (Arli et al., 2018; Lilien, 2016; Ritter & Pedersen, 2020a).

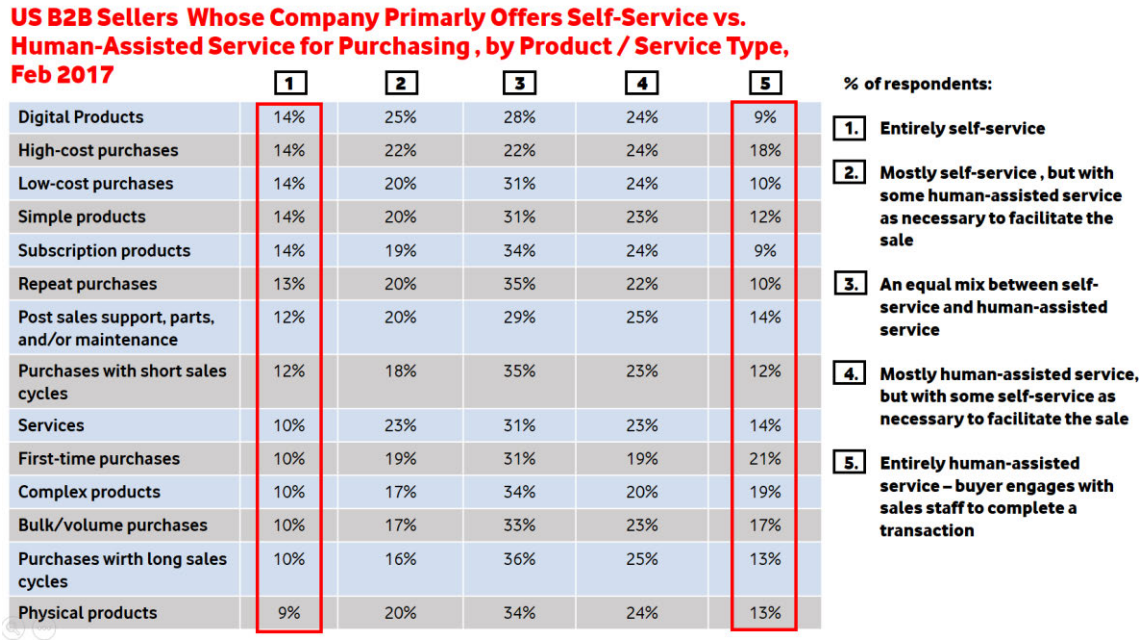
This development of and demand for technology-enabled digital services is neither restricted to a few prominent examples in the corporate domain, as outlined above, nor to a certain geographic area. Indeed, it is a global trend, as digital services have risen 22% within the past 10 years (Gartner, 2019). In fact, B2B service offerings in general and technology- and knowledge-intensive business specifically are the fastest growing segments in the economy (Wirtz et al., 2018). While the shift from product to service is well-documented in academic literature, a further acceleration based on digitalization is visible (Verhoef et al., 2021).

The reason for this is twofold. First, in taking a service consumer perspective, there is evidence that B2B customers demand ever more digital services in the form of self-service, as they are often faster, more convenient, and offer greater availability (Forrester, 2019). Additionally, the potential of digital applications is known from the business-to-consumer (B2C) field, with prominent examples such as Amazon, the world's largest book seller having no physical bookstores; Uber, the world's largest private transport firm owning no vehicles; and Airbnb, the world's largest accommodations provider owning no buildings (Culpeper & Thelen, 2020). As every B2B actor is a B2C consumer, expectations in the B2B environment are imposed even more strongly (Floridi, 2015; Lilien, 2016). Second, and from a service provider perspective, digital services are claimed to be cheaper in comparison to traditional face-to-face services, offering cost savings as well as differentiation potential (Gnädinger, 2011 & 2012; Scherer et al., 2015). Both are accepted to be highly relevant factors for firms looking for cost savings as well as new revenue potential as part of their value optimization strategies (Lindgreen et al., 2012). This field seems to be even more interesting as necessary hardware and software are becoming more affordable and are no longer restricted to large corporations (Ramaseshan et al., 2015).

However, even as the provision of digital services is seen as the 'new normal', as digital technologies are widespread rather than being extraordinary (Ritter & Pedersen, 2020a), utilization in the B2B environment remains heterogeneous (see Figure 1). This fact is pointed out by the Organisation for Economic Co-operation and Development (OECD), which states that:

'…the uptake of digital technologies remains particularly low among small firms even for technologies that seem particularly relevant for SMEs (small and medium-sized enterprises), such as cloud computing'.

(OECD 2017, p. 36).



US B2B Sellers Whose Company Primarly Offers Self-Service vs. Human-Assisted Service for Purchasing , by Product / Service Type, Feb 2017

	1	2	3	4	5
Digital Products	14%	25%	28%	24%	9%
High-cost purchases	14%	22%	22%	24%	18%
Low-cost purchases	14%	20%	31%	24%	10%
Simple products	14%	20%	31%	23%	12%
Subscription products	14%	19%	34%	24%	9%
Repeat purchases	13%	20%	35%	22%	10%
Post sales support, parts, and/or maintenance	12%	20%	29%	25%	14%
Purchases with short sales cycles	12%	18%	35%	23%	12%
Services	10%	23%	31%	23%	14%
First-time purchases	10%	19%	31%	19%	21%
Complex products	10%	17%	34%	20%	19%
Bulk/volume purchases	10%	17%	33%	23%	17%
Purchases wirth long sales cycles	10%	16%	36%	25%	13%
Physical products	9%	20%	34%	24%	13%

% of respondents:

1. Entirely self-service
2. Mostly self-service , but with some human-assisted service as necessary to facilitate the sale
3. An equal mix between self-service and human-assisted service
4. Mostly human-assisted service, but with some self-service as necessary to facilitate the sale
5. Entirely human-assisted service – buyer engages with sales staff to complete a transaction

Figure 1: Self- and Traditional-Service Share Distribution by Products in EMarketer (2018).

Attempts to explains the heterogeneous use of digitalization in B2B transactions from an academic perspective are plentiful, with the most prominent declaring that B2B firms are lagging in digital maturity behind their counterparts in the B2C field (Catlin et al., 2016). This is often argued with respect to the higher complexity in B2B markets, making end-to-end digitalization efforts more challenging and, therefore, more cost-intensive (Brennan et al., 2020). Tim Höttges, CEO of Deutsche Telekom AG, a large multinational telecommunications operator, supports this from a practitioner's side by saying that companies mainly developed their digital service offerings in the B2C field

and that many opportunities remain in the more complex digital B2B services (Di Lorenzo, 2015). However, even though many potential opportunities exist, digitalization efforts in B2B commerce are claimed to be challenging. Business relationships and underlying products and services differ fundamentally from the B2C context in terms of complexity (the number of entities and stakeholders involved in sourcing, production, and delivering), customization of products and services, and many other elements (Lilien, 2016; Mencarelli & Riviere, 2015). This difference in characteristics is even more critical, as it is agreed in the literature that insights from B2C service digitalization cannot be universally applied to B2B due to these differences and underlying business logic (Kumar, 2016; Lilien, 2016; Scherer et al., 2015). In summary, there is a notion in the literature that for B2B services, a new set of digitalization frameworks must be considered that can be inspired by B2C experience but cannot be simply copy-and-pasted. Additionally, it must be noted that research in the field of B2B service digitalization is still in its infancy (Arli et al., 2018; Lilien, 2016; Wirtz & Kowalkowski, 2022).

The trend towards service digitalization in B2B activities is not new to academic discussion and has been addressed in recent decades (Fikirkoca, 2007; Sila, 2015). However, when it comes to adoption of technology and digitalization of services, research is predominantly focussed on e-commerce, where more than 55 adoption models using more than 100 adoption elements are proposed (Sila, 2015 & 2018). Most studies in this field of digitalization have focussed on the issue of what influences adoption and how to manage it, in other words, by ‘doing things right’ (Ramaseshan et al., 2015; Sila, 2015). What is yet not fully clear are the different avenues to take within the ‘the right things to do’ direction and the various opportunities and potential challenges for digitalization for B2B firms. More specifically, how can these firms decide on the most suitable options as well as the factors to watch out for? In addition, there is only fragmented research in the B2B field that combines service digitalization undertakings and relationship management, with a few notable recent examples having opened this field (Stoffer, 2019; Stoffer et al., 2019). This seems stunning, as services are expected to be a major part of proposed future revenue streams in the field of B2B research (Brennan et al., 2020; Pagani &

Pardo, 2017; Stoffer, 2019; Victorino et al., 2018) and the influence of relationships is an accepted factor that has been confirmed in recent studies (Håkansson, 1982; Zhang et al., 2016). It appears that the mainstream of research has treated digitalization as just another technology, addressing it with academic tools such as technology adoption models of the past (Parviainen et al., 2017; Sila, 2015). The generalizability of much-published research on this issue seems problematic. First, recent research asks for differentiating digitalization, as several different types with a variety of business rules exist (Ritter & Pedersen, 2020a). Second, limiting the academic discussion to pointing out how to do things right and less on what are the right things to do to increase benefits when introducing digitalization in exchange constructs leaves out possible further insights. Besides the academic argumentation to engage in a research project on B2B service digitalization there was a strong professional motivation behind it. Within my job as a department head, owning the B2B Customer Relationship Management (CRM) development roadmap, I was constantly faced with digitalization activities in the service space. What started as the accumulation of different technical digitalization endeavours became soon a demanding quest far beyond technological challenges. I realised during all these digitalization activities that challenges such as ‘How to bring certain technological developments into usage?’ became as important as developing the underlying technical solutions themselves. However, back then my team and I had no structured approach to engage in technology adoption activities and we were managing all challenges on a day-to-day basis. As there was little time on the job to answer these questions, and no model to plan, steer, and improve our digitalization activities at hand, I decided to engage in a research project with the objective to close these gaps. My intention was to be better prepared myself, and to help others making more informed decisions when deciding on, planning and executing their digitalization project in the B2B service space. Furthermore, I was hoping to lay a first scholarly foundation for a possible future engagement as a lecturer at one of the local universities. I was already approached by several institutions if I would be willing to teach; however, I wanted to add a contribution to knowledge element to the in-practice experience by engaging in this research project.

1.2 Different Benefits Perspectives on Digitalization in Business-to-Business

Within this context of cost and benefits, ‘efficiency’ has been mentioned in the literature as a concept of ‘doing things right’ (Rämö, 2002; p. 572). Since the study of manufacturing processes by Taylor, efficiency has been claimed for the manufacturing revolution through concepts such as Deming’s total quality management (TQM), Taylor’s scientific management, and other concepts within lean management, such as Kaizen and just-in-time delivery (Drucker, 2007; Waring, 2016). The fundamental logic behind these concepts is always the same: to create a swift and smooth flow of services and products from the producer to the customer by process environments characterized by exact clock timings (Rämö, 2002). According to Rämö (2002), such an idea of doing things right, meaning in an efficient manner, implies an improvement and management of a situation already known, and that already exists. However, it is suggested that too strong a focus on efficiency alone tends to restrain a certain awareness of changing demand and, therefore, less innovativeness and other challenges and pitfalls (Heavin & Power, 2018; Rämö, 2002). Examples of this are numerous within history, ranging from prominent ancient cases such as the Ford Model-T, where a pure focus on efficiency gains ignored customer demands and led an immense market share to completely decay, or more recent examples from the telecommunications industry, where short message services (SMS) were heavily cannibalized by new innovative messaging services as WhatsApp (Resende et al., 2019). Examples within the service field can be found, where a blind focus on cost efficiencies has led to increased customer churn, as services may have been more efficient but failed to meeting customer expectations any longer (Lee & Cranage, 2018; Zhu et al., 2013). This leads us to the complementary notion to efficiency, ‘effectiveness’, which has been referred to as the concept of doing the right things (Rämö, 2002, p. 572). As such, effectiveness indicates a political dimension of governance focussing on defining targets towards which organizations should objective their business and innovation strategies (Scherer & Voegtlin, 2020). In the context of efficiency and effectiveness, Sørensen and Torfing (2009) state that:

'Networking with stakeholders in the identification and use of common means will tend to increase efficiency, and networking with stakeholders in the pursuit of common ends will tend to enhance effectiveness'.

(Sørensen & Torfing, 2009; p. 239).

It appears important to enrich the current 'efficiency – doing things right' dominant discussion within B2B digitalization literature with an 'effectiveness – doing the right things' perspective that is currently underrepresented. Most of all, it is important to take a combined view. This seems even more relevant, as there is evidence that a systematic application of concepts based on efficiency only – including lean management principles and tools such as pure self-service technology (SST) – faces considerable difficulty in generating additional potential (Radnor & Osborne, 2013; Ramaseshan et al., 2015; Torfing et al., 2019). Moreover, an over-standardization for the sake of efficiency gains can even lead to a reduction in service productivity (Moynihan, 2013; Røiseland et al., 2015). The demands of differentiating service digitalization activities and service digitalization transformation, including value aspects, have been echoed recently within the academic domain. Based on 16 expert interviews, Wirtz and Kowalkowski (2022) highlights the differentiation of alternative pathways of service providers to increase value as one of the top future research avenues (see Table 1). Anarelli et al. (2021), having systematically reviewed 249 articles, supports this by saying that approaches, mechanisms, and activities that result in the implementation of digital service platforms are the most interesting future research directions on digitalization and digital capabilities.
Shree et al. (2021), having analysed 146 articles on digital platforms, add to the discussion of service digitalization. This domain has been studied mainly from a technology and information system perspective, and they suggest that a practical managerial perspective would be a fruitful future research avenue (see Table 1).

Table 1: Extracts of Future Research Directions in B2B Digitalization and Service Management

Source	Thematic Field / Details	Direction for Future Research in Academia – Extract
Wirtz and Kowalkowski (2022)	B2B Service Digitalization, Cost-Effective Service Excellence, Value Capture Insights from 16 expert interviews of executive teaching academics in fields above	**01. Building capabilities to capture value in B2B:** *'…what are the alternative pathways service providers can use to translate enhanced value creation into increased revenues, and what are the specific advantages and disadvantages that each pathway offers?'* **02. How to realize servitization in B2B:** *'Research is needed on how B2B firms implement servitization, strategically approach their transactional environment, and how they initiate or engage in the reconfiguration of their service systems'.* **03. Potential pathways of cost-effective service excellence (CESE) in B2B:** *'What are the potential alternative pathways to achieve CESE, the specific opportunities and challenges each pathway brings, and the conditions and factors that make each specific pathway more or less effective?'*
Anarelli et al. (2021)	Digitalization, Digital Transformation, Digitalization Capabilities Systematic literature review of 249 articles	**01. Insights in implementation process:** *'Most interesting future research directions on digitalization capabilities are: … Approaches, mechanisms, activities, and processes resulting in the implementation of digital platforms and the development of digital platforms capabilities…'* **02. Research phase of digitalization capabilities:** *'This dispersion of papers indicates that literature on this topic is still into a developing phase, with authors studying the topic from different points of view and with different theoretical heritages. This proves that a unified corpus of academic production in the field of digitalization capabilities still has to be developed…'*
Shree et al. (2021)	Digital Platforms in B2B Markets, TOE Framework Systematic literature review of 146 articles	**01. Context of platform adoption in B2B:** *'Our review unearths the need for stronger theoretical frameworks to better understand the adoption of digital platforms in B2B context'.* **02. Managerial / in practice perspective on platforms in B2B:** *'The platform service provider has been studied mainly from an IT/IS technical perspective rather than managerial/marketing perspective ...'* **03. Dyadic view on B2B platforms:** *'…most of the studies on digital platforms in B2B focus either on service provider or client side; there are very few studies that explore the dyadic relationship'.* **04. Scarce insight on corporate firms:** *'Most of the sector-specific studies were conducted in the context of small firms or SMEs (30%), with only a few studies focusing on public sector organizations (3%) or big organizations (5%)'.*
Parida et al. (2019)	Digitalization, Business Model Innovation, Advanced Services Systematic literature review of 106 articles	**01. Process of service digitalization:** *'…literature on digital servitization and business models has scarcely researched such processes and how they unfold. What are the key phases, activities, and roles, and how should the customer be involved in value creation?'* **02. Organizational and culture changes in digital servitization:** *'A deeper understanding of how a digitalization culture can be instilled across the firm's delivery network is a necessity'.*

In addition to shedding light on the ‘why’ discussion in service digitalization – in other words, why is a company implementing a service digitalization: efficiency, effectiveness, or both? – it appears important to explore the ‘how’ factors as well. Parida et al. (2019) analysed 106 articles in the field of B2B service digitalization and concluded that academic research regarding how service digitalization implementation unfolds in practice is lacking, pointing out that it would be beneficial to research the key phases, activities, and roles (see Table 1).

Within the digitalization process and underlying phases, it is suggested that a possible dualism of time is implied in the discussion of effectiveness and efficiency. On the one hand, there is the perspective of ‘right timing’ or a ‘window of opportunity’, which is often referred to as *kairos* from ancient Greek, as the non-chronological aspect of time defines a timely moment. On the other hand, there is the concept of *chronos*, which defines time as a serial order, measure, and change; therefore, it is the ruling factor in efficiency (Rämö, 2002). In this sense, *chronos* and *kairos* are not sharply distinguished classifications but are a complementary set of human time constructs, with *chronos* suggesting a specific order of things and time as phases in digitalization projects and *kairos* suggesting that there is a certain time that can have an impact, such as the recent COVID-19 pandemic (Almeida et al., 2020; Kelly et al., 2014). With respect to the field of service digitalization is seems relevant to explore what to do and when to do it. The ‘what’ could be taken from an efficiency or effectiveness angle or a combination of both perspectives. The ‘when’ would need to address aspects of acting chronologically (*chronos*) as well as choosing the right moment to do it (*kairos*), meaning the most beneficial timing of service digitalization.

In summary, it can be said that, although many prominent researchers outline the impact of digitalization on business relationships as a top research priority (Arli et al., 2018; Lilien, 2016; Ritter & Pedersen, 2020a) and the importance and potential of services (Lilien, 2016; Parviainen et al., 2017), up-to-date insights are missing regarding the concrete potential of service digitalization in B2B relationship value management. It is not clear exactly what needs to be considered – efficiency and/or effectiveness goals – when engaging in service

digitalization activities based on use cases. In addition, there are few insights into when to introduce or to develop service digitalization in business relationship settings, since many factors influence whether a relationship will be maximized or jeopardized (Anarelli et al., 2021; Parida et al., 2019; Sheer et al., 2021; Wirtz & Kowalkowski, 2022). Understanding these topics seems relevant, as personal interactions remain dominant in both personal relationships (Hoar, 2015; McKinsey, 2020) and digitalization efforts that target efficiency goals (Ramaseshan et al., 2015; Scherer et al., 2015).
Given the technological possibilities available to meet customer demands as well as the best practices from the field of B2C, B2B companies could benefit even more from using digital services in their relationship value management by better understanding their options in this field, including awareness of influencing factors and of how to manage potential challenges.

The field of engagement for this research project, which started back in autumn 2016, seems even more relevant today: The global COVID-19 pandemic that began in early 2020 has demonstrated the importance of digital tools in B2B activities as well as the increased willingness among customers to use them. Furthermore, there is a significant demand for research in this field, as indicated in the literature (Anarelli et al., 2021; McKinsey, 2020; Parida et al., 2019; Sheer et al., 2021; Wirtz & Kowalkowski, 2022).

1.3 Objectives of the Research

The topic will be explored with several objectives in mind (see Figure 2). As a first objective, options for service digitalization in B2B relationship value management are outlined. This seems important, as most studies have been limited to highly specific cases of service digitalization as self-service-only applications (Ramaseshan et al., 2015; Sila, 2015), possibilities of servitization in manufacturing (Victorino et al., 2018), or a niche field such as the impact of digitalization on upstream supply-chain interdependencies (Vendrell-Herrero et al., 2015). While such research has enabled a detailed understanding of digitalization mechanisms from an academic point of view, from a practitioner's perspective, this multitude of specific subjects and detailed findings present the

risk of ‘not seeing the forest for the trees’. On a holistic level, companies are simply attempting to determine the potential of service digitalization and how to choose a path most suitable to them (see Sila, 2015; who identified 55 adoption models with over 100 influencing elements). Therefore, it is the objective of this thesis to outline the possibilities that exist for service digitalization in B2B so as to place the practitioner audience in a more informed position to understand the many roads to take to enhance value.



Figure 2: Objectives of this DBA Research Project on B2B Service Digitalization and Relationship Value Management

A second objective is to identify a list of potential influencing factors that may affect choosing one or the other road from a value perspective, offering indications for why certain firms engage in service digitalization measures much more heavily than others and what value perceptions exist as a sum of all benefits and costs incurred. In this respect, technology adoption literature such as the technology, organizational, and environmental adoption (TOE) model by Tornatzky and Fleischer (1990), and many others have proposed several adoption dimensions and underlying elements. However, existing research remains more general, offering few insights into the benefits and costs that influence a service digitalization decision. Taking a dyadic value perspective on the value of service digitalization activities in the B2B space as a sum of possible benefits and costs incurred is another objective of this thesis, supported by recent literature pointing out that a stronger focus on dyadic perspectives is needed (Shree et al., 2021). This seems important, as the main

body of managerial literature and part of academic literature seem to highlight the benefits side of service digitalization. However, it must be understood that such benefits come at a cost, and benefits and costs can be seen from different angles by providers and users of digitalization services.

Third, this thesis aims to identify the corresponding challenges that may be experienced in various phases of digitalization projects. This will add to the scarce research on how service digitalization transformation projects unfold in practice (Wirtz & Kowalkowski, 2022). Even as each service digitalization endeavour can be argued to be highly individual, based on the situation and circumstances, this research outlines two in-depth case studies that provide real-life examples of roads to take and challenges to manage in B2B service digitalization.

Despite the importance stated in the research of differentiating services (Oliveira & Roth, 2012; Raddats & Easingwood, 2010) and relationship value (Wilson, 1995; Zhang et al., 2016), no service digitalization study integrated this combined perspective in its scope. From a contribution to practice perspective, it is the fourth and final objective of this thesis to develop a B2B service digitalization – relationship value framework based on insights gained. This is bringing together in one place the relevant elements for B2B relationship value enhancement driven by service digitalization.

It is hoped that this research will enable practitioners in B2B firms to make informed decisions about B2B service digitalization measures to increase relationship value. This contributes potentially to reduce the high failures rates in digital transformation activities, which can be as high as 90%, by giving B2B decision makers and programme managers a foundation on which to increase their success likelihood when engaging in service digitalization activities to increase relationship value (Ramesh & Delen, 2021). Capturing these dimensions and underlying factors within a framework could provide a useful tool for firms that are conceptualizing and developing their digital service propositions to maximize relationship value. Perhaps this could also facilitate the transformation within the B2B domain of implementing service digitalization

capabilities on a broader scale, where the adoption of a customized digital service approach remains the exception (see Figure 1).

From a contribution to knowledge perspective, this research adds to the scant research on service digitalization in the B2B space that is highlighted by recent studies (Lilien, 2016; Mahlamäki et al., 2020; Pagani & Pardo, 2017; Parviainen et al., 2017). Additionally, this study would address future research directions that are highlighted in recent academic research (see Table 1). The understanding of this subject is crucial, as B2B customer experiences are increasingly built on personalized service solutions enabled by technology (Pappas et al., 2017) as well as with a combination of social, physical, and digital elements (Bolton et al., 2018) in a changing world where in-person contacts are growing more restricted (McKinsey, 2020a).

From a practitioner's perspective, all of this seems necessary, as companies often fail to achieve the expected revenue streams from digitalization investment, which is known as a 'digitalization paradox' (Gebauer et al., 2020). To the author's best knowledge, academia has presented no service digitalization framework supporting B2B firms in choosing their service digitalization strategy to maximize rather than jeopardize relationship value. This provides indications of what possible challenges exist and how to address them. In addition, management literature, in the form of consultancy reports or whitepapers, highlights the subject as promising (Forester Consulting, 2017; Hoar, 2015; McKinsey, 2017). However, in addition to providing high-level indications about what might be possible drivers and how to approach them, such consultancy papers miss qualitative or quantitative support, openly admitting that it is a promising but challenging field by saying:

'And while B2B players share with B2C companies the need to build strategies around the core of understanding customer journeys, the complexity of B2B relationships makes digital-transformation efforts unique. Carefully parsing those complex customer relationships, striking the right balance of human and digital interactions, and maintaining an agile approach to navigating intricate customer networks will be among the keys to success'.

(McKinsey, 2017; p. 10).

1.4 Research Methodology Employed

The following research methodologies are employed in this research project (see Figure 3).

First, this study outlines the latest knowledge and gaps from academia in the form of a literature review in the fields of B2B relationship management theory, technology theory, service theory, and value theory (see and Chapter 2). Engaging in these multiple fields is vital, as the topic of this research project cannot be limited to one field only, and it is generally suggested in the literature to take a broader view when exploring a research topic (Saunders, 2016; Shree et al., 2021).

Second, findings in academic literature are enriched with the latest in practice knowledge by knowledgeable experts from top-tier international consultancy firms in the field of B2B service digitalization by engaging in eight explorative qualitative semi-structured expert interviews (see Chapter 4). The intention is to confirm findings from the initial literature review as well as possibly revealing new research avenues to consider regarding the challenges and gaps in B2B digitalization from a practice perspective.

Third, two in-depth case studies in the field of B2B service digitalization are employed, consisting of firms from the corporate segment and a total of 17 informants. The objective is to highlight two real-life service digitalization use cases from the B2B space and to indicate what service digitalization path these firms have chosen as well as the challenges they faced.

In addition to linking these insights to findings from the literature review and expert interviews, this should support the strong practical aspect of a DBA by providing real-life business examples.

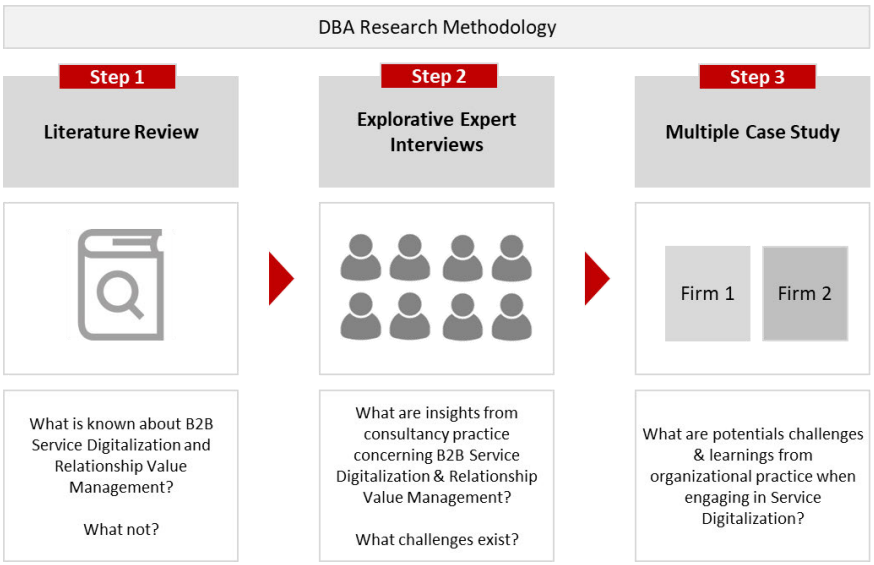


Figure 3: DBA Project Research Methods

1.5 Structure of the Thesis

This research is structured in seven chapters (see Figure 4).

Chapter 1 has provided an overview of the topic, the objectives, and a high-level look at the methodologies used.

Chapter 2 presents the various fields of theory that link into the DBA topic, covering latest insights and gaps from the fields of B2B, service management, technology, and value management (see Figure 5). In addition, two research questions are raised based on gaps identified in the literature (see Section 2.8).

Chapter 3 outlines the philosophical position of the author, provides a structured argumentation for the methodologies chosen and presents ethical considerations that are linked to the DBA project.

Chapter 4 is dedicated to the first primary data engagement in this study, which consists of eight explorative expert interviews. In addition to presenting critically the advantages and possible challenges of this methodology, the expert selection process and findings are outlined. As part of this chapter, a first draft of the intended service digitalization relationship value framework is constructed (see Figure 2 – Objective 4). In addition, a third research question for this research project is added based on finding of expert interviews (see Section 4.7 & Chapter 5).

Chapter 5 covers two in-depth case studies of firms from the B2B corporate segment that have engaged in different paths of service digitalization. Alongside details of the firm selection process, findings are outlined that complement the intended framework.

Chapter 6 summarize the findings of the primary research activities in this DBA project (Expert interviews and case studies) and reflect them in line with extant literature. As a result a set of propositions will be presented that will be structured along the outlined research questions. In addition, a service digitalization relationship value framework will be proposed that combines key elements of this DBA project.

Chapter 7 outlines the contribution to theory and practice and discusses limitations and future research propositions. This chapter ends with a personal reflection of the author regarding the last six years within this DBA programme.

A bibliography and a set of appendices are added that provide in-depth details about the primary research methodologies outlined in Chapters 3. Materials include administrative documents such as participant consent and information sheets as well as questionnaires and Nvivo 12 coding schemes.

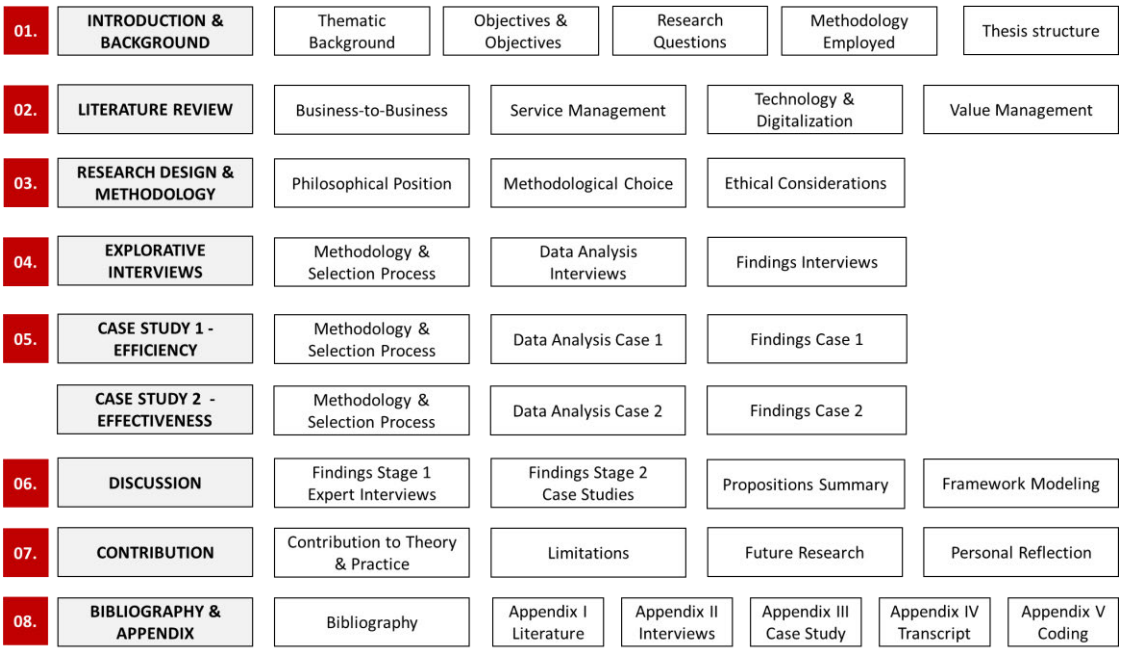


Figure 4: DBA Thesis Structure

2 LITERATURE REVIEW – THE BUSINESS-TO-BUSINESS LANDSCAPE IN TIMES OF DIGITALIZATION

After presenting the method of the literature review, this Chapter introduces the domain of B2B in terms of economic relevance, underlying business principles, and logics of relationship management and how it differs from the field of B2C. In addition, the concepts of service, value, and technology are presented as well as their roles in a B2B setting. The objective is to summarize the current state of knowledge and management theory as well as to identify potential research gaps to be addressed.

2.1 Literature Review Methodology

This section states the research methodology employed for the field of B2B relationship value enhancement via service digitalization with the objective of identifying subjects where additional research would be beneficial based on a literature review (Kraus et al., 2020; Paul & Criado, 2020; Saunders, 2016).

A literature review is a:

'… systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of reported documents'.

(Fink, 2019; p. 6).

In this respect, the literature review process is an iterative activity of defining keywords, parameters and searching for sources that include and/or have these themes as a topic of focus, recording and critically reflecting the body of literature (Saunders, 2016). In addition to the purpose of narrowing the research topic as well as explaining the corresponding aims and objectives, a literature review seeks to provide an account of what is known and what would be beneficial to know in a certain field to formulate any research questions (Fink, 2019).

The literature review started in early 2017 based on a keyword search in principal academic databases such as EBSCOhost, Emerald Insight, ProQuest, and ScienceDirect (see Table 2).

Table 2: Literature Review Delimitation

Delimitation	Details
Field	Business-to-Business, Relationship Management, Service Management, Technology - Digitalization, Digital Transformation, Self-Service, and Value.
Academic Databases	EBSCOhost, Emerald Insight, Google Scholar, SAGE Journals, ScienceDirect [Elsevier], Scopus, SpringerLink, Taylor & Francis Online, ProQuest, Elsevier, Researchgate.com
Period	2000–2022 as focus period
Search areas	Abstract, title, keyword, co-citation references
Type	Peer-reviewed journals (focus)
Language	English, German

The following four main research fields in the literature and corresponding scientific scholarship were identified, critically reviewed, and clustered – Business-to-Business, Relationship Management Theory, Service Theory, Technology Theory, and Value Theory (see Figure 5).

First, the field of B2B theory was identified because it defines the context of the DBA project. Keywords used included business-to-business, industrial management, and relationship management focussing on latest insights and proposed research directions (Lilien, 2016; Prohl et al., 2020). These were mapped to provide the theoretical and practical frame and literature foundation for this research project (see Appendix I – Figure 41). Besides giving a general overview of the B2B environment in general and its growth drivers (see Section 2.2), relationship aspects were identified and addressed as an important topic (see Section 2.3.1 & 2.4.1).

Second, the field of technology theory was identified as crucial, as it is claimed to be one of the driving transformational forces in B2B (see Section 2.4). This is due to the availability of hardware, software, and their combinations leading to new processes such as self-service approaches, business models, and value generation avenues (Vize et al., 2013). In addition, technology adoption factors – for example, provider and user capability – and experiences of buyers from B2C were identified, as technological developments have a significant impact on business models (Brennen & Kreiss, 2016; Parasuraman, 2000;

Parasuraman & Colby, 2015). Keywords in this field were: B2B technology, B2B digitalization, digital transformation, and technology adoption.

Third, the field of service theory was reviewed in detail, as it is claimed to be one of the main differentiation points in B2B, which is often characterized by product commoditization (Lilien, 2016; Prohl et al., 2020). Keywords in this field included B2B service management, servitization, digital servitization, and service failure (see Section 2.5 & 2.6.2).

Fourth, value theory has been a focus of marketing research in recent decades, as generating value is seen as the principal motivation when engaging in transactional activities within the B2C and B2B spaces (Eggert et al., 2019; Kohtamäki & Rajala, 2016). Keywords included were B2B value management, value creation, relationship value, and value co-creation (see Section 2.7).

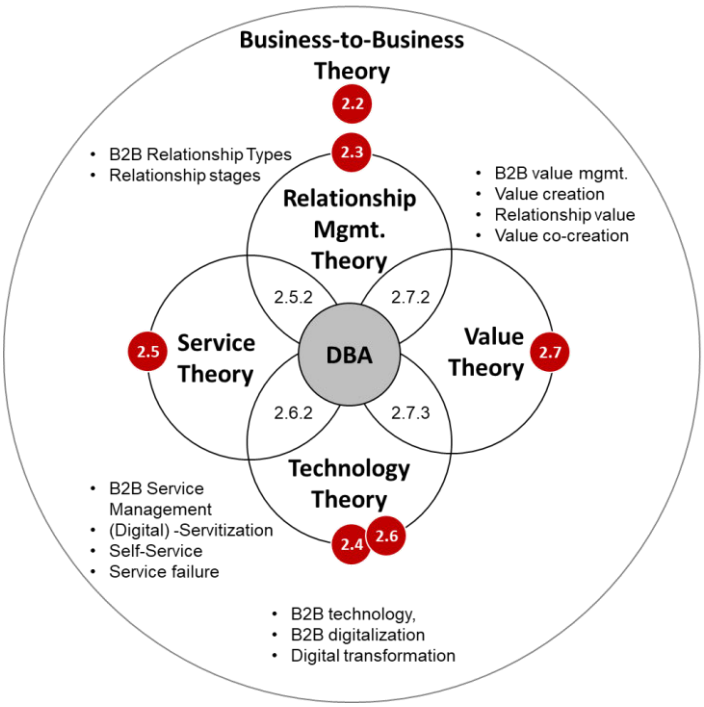


Figure 5: DBA Literature Review Fields, Key Search Words, and Corresponding Thesis Sections

Identified sources were clustered in thematic fields and gradually extended using the 'pyramid principle' framework proposed by Minto (2009). This framework proposes a hierarchical structure based on horizontal and vertical logic of thoughts. The horizontal logic is about presenting the underlying reasoning, and the vertical logic is about presenting the storyline in a question-

and-answer dialogue. The idea behind the vertical logic is to start with the main idea in this research project – B2B relationship value enhancement via service digitalization – asking questions like '*What is B2B?*', '*What is relationship value?'*, '*Why is it important to talk about it?*' and '*What is the situation, complication and possible answer?*'. The horizontal level represents the number of statements that can be found to the corresponding thematic field which can be derived inductively or deductively (Minto, 2009). A detailed account of the pyramid principle with corresponding horizontal and vertical clusters can be seen in Appendix I (see Figure 40 & Figure 41).

2.2 Relevance and Growth Drivers in Business-to-Business

According to calculations by Lilien (2016) global Business-to-Business buying volume accounts for estimated $50 trillion per annum. This amount should be even significantly higher today in 2023 underlying the gross domestic product (GDP) growth predictions of the World Bank (2019) which were 3.0% p.a. since 2015. However, a certain fall-back must be acknowledged with the current COVID-19 situation leading to a reduced demand as well as negative impact on global supply chains (Hartmann & Lussier, 2020).

With this economic relevance, B2B buying volume is significantly and roughly the same size as Business-to-Consumer (B2C) buying volume (Gartner, 2019). Explanations for this can be found in the production- and supply chain management theory. Most services and products offered in the field of B2C are only made possible based on a complex environment of numerous production infrastructures, tools, as well as processes put into place by multiple interacting firms of different sizes and sectors (Lilien, 2016; Mencarelli & Riviere, 2015).

One of the growth drivers in B2B buying volumes within the last two decades has been e-commerce. E-commerce can be defined as the sale and purchase of services and goods over the internet, which is an example for the fast progress of technology impacting heavily formerly exclusively in-person handled activities (Lilien, 2016; Rosario & Raimundo, 2021). The US department of Commerce estimated in 2010 that from the $4.13 trillion in total e-commerce

volumes, approximately 90% were B2B and only 10% Business-to-Consumer, (Lilien, 2016). From an European perspective, Forrester (2019) reports that Germany, Italy, France, the UK, and Spain B2B e-commerce volume will make up 17% of total sales volumes by 2024 and will reach approximately €2.8 trillion of total trade volumes. However, this high growth outlook is not a US or EU phenomenon only. In their global e-commerce in-depth report, Statista (2019) predicts 13% average growth rate per year for global e-commerce (see Figure 6). Besides the growing revenues volumes, predictions of e-commerce technology investments are also estimated to grow by approximately 15% per annum, confirming the growing importance of technology infused products and digital services within B2B buying. A trend that is further pushed by the willingness of businesses to invest in this domain (Statista, 2019).

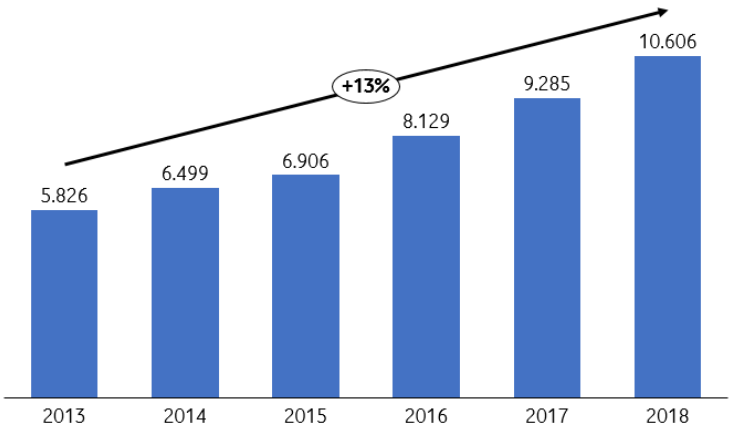


Figure 6: Global B2B E-Commerce Revenue in Billion US$ (Statista, 2019)

E-commerce is just one prominent example of the spread of technology in B2B buying, demonstrating the strategic importance for companies to build up technological capabilities to adapt to fundamental changes in producing and offering their products and services, as well as interacting with their customers (Oliviera & Dhillon, 2015).

Another recent trend in the light of technological developments is (digital-) 'servitization' that can be described as the movement of pre-dominantly manufacturing firms offering (digital-) services in addition to their core physical products (Weigel & Hadwich, 2018). Reasons for that are plentiful as the ever-increasing competitive pressures - many industrial products lack differentiation potential suffering from interchangeability - as well as increasing customer

demands that intensify the need to offer new propositions with the help of additional services (Kastalli & van Looy, 2013).

All in all, there is a notion in the literature that technology is changing fundamentally the very nature of firms and their underlying business models on which services have the potential get better, more personalized, and consequently new value stream potential with the help of technology (Rust & Huang, 2014). A claim that is materializing in numbers with digital B2B service revenues that have been growing by 22% during the last ten years (Gartner, 2019).

2.3 Business-to-Business Relationships

Within academic research the Industrial Marketing and Purchasing Group (IMP), which was formed in the early 1970s by academics from France, Germany, Italy, and Sweden, is considered as one of the main bodies having shaped initial B2B relationship research (Salo, 2006 & 2008). One of the major contributions of IMP was the introduction of the so called 'interaction model' (Håkansson, 1982 & Figure 7). Within this model, the buyer & seller relationship is highlighted as the essential element for B2B marketing having four discrete elements: (1) the interaction process, (2) participating parties within, (3) the exchange environment as well as (4) the relationship atmosphere of the interaction (Cunningham, 1982). What seems like common knowledge today was a new perspective taken back then by saying that participating B2B organisations within commercial exchange activities are influenced by organizational size, technology, structure, organizational experience, strategy, and individuals within these organizational bodies.

The proposed interaction process by IMP covers short-term as well as long-term aspects of relationships. Aspects would include individual episodes having several exchange dimensions linking business actors as social-, financial-, information- as well as product- and service exchange dimensions (Cunningham, 1982; Håkansson, 1982). In this sense, short term episodes are claimed to be influential for relationship development, whereas long-term relationships comprise organizational adaptations and institutionalizations

(Håkansson, 1982). In addition, no matter if short term episodes or long-term relations prevail, the interaction process cannot be set apart from considering environmental influences. Such environmental factors include a company's position in the production chain, market structure, international degree of the market; all factors imposing directly or indirectly pressures and with-it influencing exchange relations (Cunningham, 1982; Håkansson, 1982).

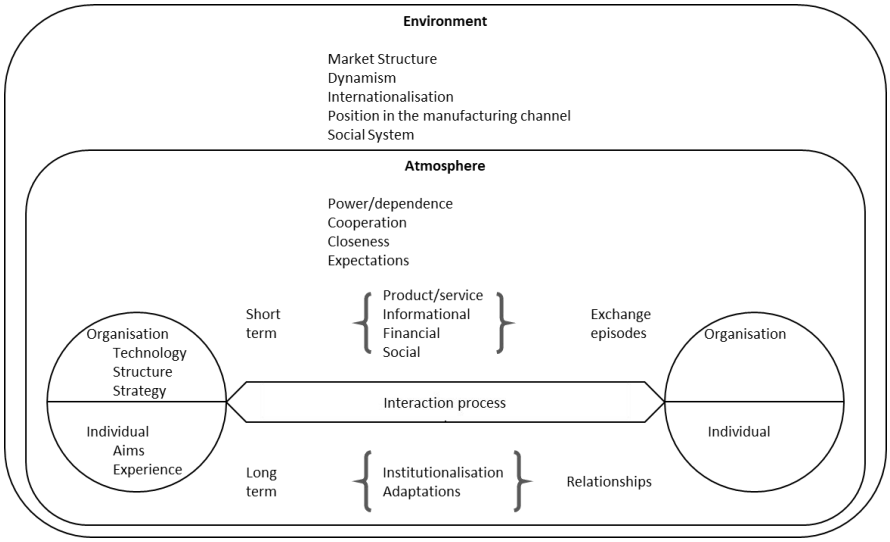


Figure 7: Business-to-Business Interaction Model by Håkansson (1982)

The importance of buyer-seller relationships for B2B marketing has been documented in numerous studies (Dwyer et al., 1987; Håkansson & Snehota, 1989; Jackson & Bazeley, 2019; Lilien, 2016; Wilson, 1995). The concept of relationship is argued to be even more important in B2B- in comparison to B2C environments as business firms are more likely to conserve a relationship as consumer purchasers (Luo & Kumar, 2013). Håkansson and Snehota (2017) propose that exchanges in B2B relationships have economic consequences and follow an economic logic as especially firms are looking for value optimisation. Therefore, it is in the product- and service providers interests to evaluate the benefits of a seller-buyer relationship given all the resources that have and will be invested. Håkansson and Snehota (2017) note as well that in this sense a relationship can be viewed both as a market investment, and as an asset from the sellers' perspective. In addition, they claim that such investments take considerable time to achieve a return on investment, as a trade-off between benefits and costs incurred, especially from newly created

relationships; a claim that is also echoed in other relationship research (Ford, 1980; Håkansson & Snehota, 1989; Håkansson & Snehota, 2017). Consequently, it seems reasonable to consider the costs and benefits of technological measures in form of digitalization influencing the relationship and its value.

2.3.1 Traditional and Emergent Types of Business-to-Business Relationships

Within research the term ‘relationship’ has been used in heterogeneous ways throughout marketing literature portraying a range of relationships from simple dyadic ones up to complex network operations (Håkansson & Snehota, 2017; Ford, 2002; Weiber & Kleinaltenkamp, 2014). In this sense, marketing scholars like Zolkiewski (2004) cautioned against the ubiquitous use of the term ‘relationships’ and that a necessary distinction between different relationship types is important to make as each relationship type inherits different characteristics to be addressed accordingly to achieve the intended outcome.

There is a considerable amount of literature that supports a differentiation in ‘transactional’ and ‘relational’ constructs (Backhaus & Voeth, 2014; Johns, 2012; Pels et al., 2000; Weiber & Kleinaltenkamp, 2014; Zhang et al., 2016).

‘Transactional’ constructs are described as discrete, often dyadic, short-term exchange activities between a small number of parties including minimal personal relationship exchanges and little to no obligation for future commercial activities (Backhaus & Voeth, 2014; Grant, 2005; Johns, 2012; Schurr, 2007).

In contrast, ‘relational’ constructs are described as more long-term oriented commercial activities as cooperations, sharing and planning between two or multiple parties. However, Johns (2012) highlights that even with a possible preference of B2B firms to be more relational- or transactional oriented, there are no clear-cut borders and depending on the context, companies might change from one orientation to another or being transactional as well as relational oriented at the same time (see Figure 8). This is supported by Pels et al. (2000) that say that whether a B2B exchange construct is relational or

transactional is based on the sellers' and buyers' views with regard to certain product- or service complexity rather than firm types in general. The idea of a 'transaction-' and 'relationship' oriented views on B2B relationships can be found elsewhere. Weiber & Kleinaltenkamp (2014) echoed the statements by Pels et al. (2000) by claiming that a firms' orientation can depend on the degree of complexity of its services and/or products (see Figure 8). In this sense, the more complex a service and/or product, the potentially more 'relational' oriented a firm would be and vice versa (Weiber & Kleinaltenkamp, 2014).

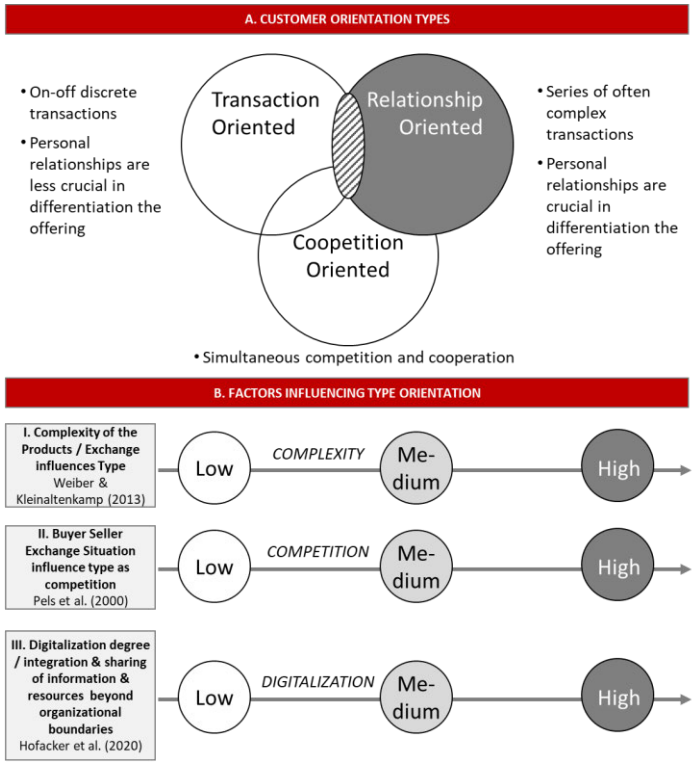


Figure 8: Own Figure Based on B2B Customer Orientation Types in Johns (2012), Weiber & Kleinaltenkamp (2013), and Hofacker et al. (2020)

In contrast to static orientation types in the past, more recent research suggests that relationship types are dynamic which can be described in so called 'relationship intensity continuums' (Zhang et al., 2016). Consequently, it can be said as there is no such thing as 'one' B2B relationship as research suggests differentiating relationship types in transaction- and relationship-oriented types. As each type has potentially different characteristics, and therefore demands a different combination of factors to fulfil these demands, adaptation of products and services are suggested (Johns, 2012; Pels et al., 2000; Weiber &

Kleinaltenkamp, 2014). Besides the traditional definitions of B2B relationships more recent literature names as well new forms as ‘coopetition’. Coopetition is a simultaneous manifestation of cooperation and competition between B2B partners (Raza-Ullah et al., 2014). Examples would include Microsoft, an international provider of software and digital communication services, offering digital products as Skype, an internet-based video-conferencing platform, partnering with T-Systems, a global provider of telecommunication services, as a reselling partner (Blaschke, 2019). In this case T-System offering own telecommunication service to B2B clients would be earning a commissioning fee for selling Microsoft’s product Skype; however, with the downside that own communication products would be cannibalised. Based on the potential of technological advancements, including the increased interconnectedness of global economy, firms are often required to compete with partners as well as collaborate with their competitors (Gnyawali & Park, 2011; Hofacker et al., 2020).

2.3.2 Development of Business-to-Business Relationships

It is widely recognized in the literature that interaction between business parties is at the very heart of B2B markets (Håkansson & Snehota, 2017; Zhu & Zolkiewski, 2015), as well as services (Edvardsson, 2005 & Edvardsson et al., 2011). Studies in the field of B2B marketing have identified ‘interaction’ as the critical factor in relationship management (Brennan et al., 2020; Canning & Hanmer-Loyd, 2002; Håkansson, 1982). However, besides a general agreement that relationships are dynamic, the way this development happens and what relationship stages exist has been heterogeneously (see Table 3). The heterogeneity materialises in numbers of different stage models proposed, the use of similar still different terms describing each phase with no accepted terminology existing. In addition, there is a difference in the underlying logic. Some relationship models are close to a customer lifecycle-approach, known from marketing literature (Weiber & Kleinaltenkamp et al., 2014) having an initial, ramp-up and decline phase as final stage. Others are declaring the last

phase as final stage (Ford, 1980), communal state (Zhang et al., 2016), or established relationship stage (Restuccia & Legoux, 2019).

Table 3: Overview B2B Relationship Development Models

1. Ford (1980)	2. Dwyer et al. (1987)	3. Wilson (1995)	4. Eggert et al. (2006)	5. Derrouiche et al. (2010)	6. Zhang et. al. (2016)	7. Restuccia & Legoux (2019)
a) Pre-Relationship stage	a) Awareness Phase	a) Partner Selection	a) Build-Up	a) Awakening	a) (Damaged State)	a) Recent Relationships
b) Early stage	b) Exploration Phase	b) Defining Purposes	b) Maturity	b) Exploration	b) Transactional state	b) Established Relationships
c) Development stage	c) Expansion Phase	c) Setting Relationship Boundaries	c) Decline	c) Expansion	c) Transitional State	
d) Long-Term stage	d) Commitment Phase	d) Creating Relationship Value		d) Engage-ment	d) Communal state	
e) Final stage	e) Dissolution Phase	e) Relationship Maintenance		e) Decline		

More recent research has addressed the question ‘how’ and ‘why’ these stages develop. It has been suggested for long that there is a gradual development of relationships in B2B environments, where phases are influenced by stages and these likewise by episodes; each element having different goals that need to be addressed accordingly to retrieve the desired benefits on a provider and supplier side (Eggert et al., 2019; Weiber & Kleinaltenkamp, 2014).

This can be seen as an indication that it is not enough to consider the type of relationship orientation alone but to consider underlying elements as the corresponding phase, stage, or episode, where the actual exchange activity is happening. These sub-elements are possibly influencing the further development of the relationship as there is a possibility that relationship-development is not unidirectional but multi-directional. In this sense, relationships can develop towards strong relationships with potentially higher value return or vice versa (see Figure 9).

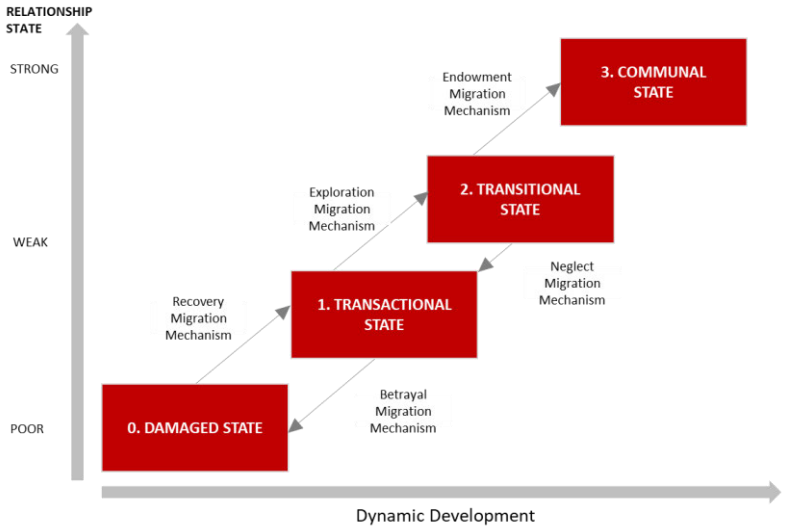


Figure 9: Overview Relationship States and Migration Mechanism by Zhang et al. (2016)

Based on a longitudinal study of 552 relationships, Zhang et al. (2016) integrated the concept of relationship-type differences with a perspective on relationship dynamism and a multi-directional development of such relationships in one model (see Figure 9). They identified 3+1 relationship states (transactional, transitional, communal, and damaged). According to their research the ‘transactional’ is the beginning of most relationships, where low to medium levels of customer dependence, commitment, and trust prevail, characterizing an undeveloped, neutral relationship. Relationships within the ‘transactional’ state consist of moderate levels of sales growth and profits. The ‘transitional’ state is defined by two main characteristics. All variables in this state are higher and it is the state with the least stickiness meaning that most firms migrate to a lower or higher state. The ‘communal’ state consists of the highest levels of customer dependence, commitment and trust producing the highest levels of sales growth and profits. The ‘damage’ state contains the lowest levels of commitment trust but medium to high level of customer dependence.

There are several important deductions that arise from the model above. Besides the quantified confirmation of different customer types, it is suggested that relationship states need to be treated differently as different characteristics prevail (trust, commitment, profits and sales growth). Consequently, such differences need to be addressed accordingly with an adequate set of

capabilities in order to ensure effectiveness (Oliveira & Roth, 2012). Such adapted capabilities could be in the form of relationship marketing activities that are more effective in some stages as in others (Zhang et al., 2016). Luo and Kumar (2013) showed that different marketing formats have different effects depending on the relationship state and that effectiveness can be increased by knowing the exact relationship state. Netzer et al. (2008) showed the effect of the sequence of customer-firm encounters on relationship development confirming quantitatively the dynamics of relationships, as well as the impact on previous encounter on buying behaviour of a subsequent one. This is particularly significant in B2B environments, where relationships tend to develop over longer periods, last longer, having higher switching costs, as well as having greater effect on outcomes as in comparison to B2C settings (Zhang et al., 2016).

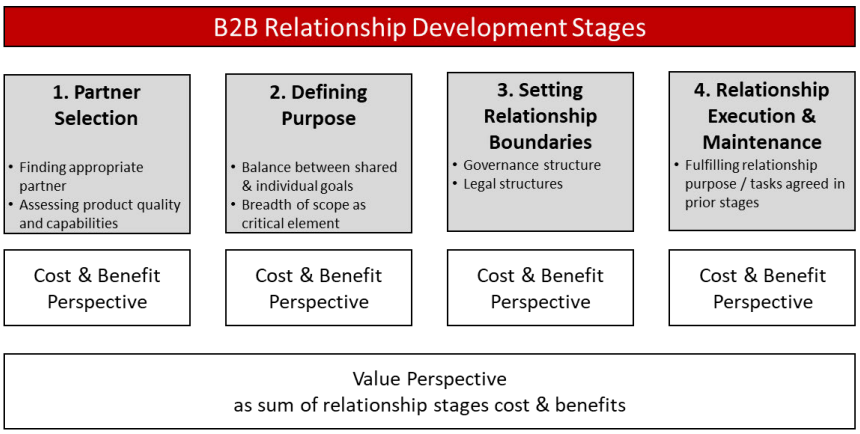


Figure 10: Adapted B2B Development Stages and Cost Benefit Perspectives Based on Wilson (1995)

2.4 Technology in Business-to-Business

Even with the recently increasing discussion of digital technologies and how they change the way what is offered (Gandhi et al., 2018), and how it is sold (Syam & Sharma, 2018), the topic of technology in business propositions, processing and underlying relations is not new to academics and practitioners. Already back in 1972 Webster and Wind pointed out the influence of buying-technology and its moderating effect on buying situations which became an ever since argued and researched topic. Examples are research activities as within the IMP Group (Håkansson, 1982) or more recent examples as the

Technology Readiness Index 1.0 and 2.0 (Parasuraman, 2000; Parasuraman & Colby, 2015). For decades, companies operating in B2B environments have been utilizing technology in form of information technology in form of enterprise resource planning and customer relationship management systems to reach cost reductions and support quality efforts (Salo, 2006).

In addition, it has been agreed for years that with the level of services exchanged between companies increasing (Ulaga & Reinartz, 2011), and companies striving to become a total solution provider - meaning that formerly exclusively products are enriched with services (Mele, 2009). In this respect the IT portfolio of a firm reflects its desired interaction capabilities with suppliers and customers (Ekman et al., 2020).

In recent years, the debate around the use of technology and data has been summarized under the headings as ‘digital’, ’digitization’, ‘digitalization’, and ‘digital transformation’ (Brennen & Kreiss, 2016; Ross, 2017; Schallmo et al., 2017; Weill & Woerner, 2018).

Even with numerous authors using these terms interchangeably, there is an indication in the literature that it is necessary to distinct them.

Ross (2017) argues to differentiate ‘digitization’ and ‘digitalization’. Whereas ‘digitized’ entails the movement from analogue to digital data (e.g. a paper-based process that is digitized using software); ‘digitalization’ refers to digital value propositions, where something entirely new is possibly created and tremendous testing efforts are necessary as the end state is not known (Ritter & Pedersen, 2020a). Brennen & Kreiss (2016) took an extensive as well as interdisciplinary approach arriving at the following definition which will be the definition for this research project. They define digitization as the:

‘… the technical process of converting streams of analogue information into digital bits of 1s and 0s with discrete and discontinuous values.’

(Brennen & Kreiss, 2016; p. 1).

In contrast ‘digitalization’ refers to the:

‘… adoption and increase of use of digital or computer technology by organization, industry, country etc.’ and ‘… the way many domains of social life are structured around digital communication and media infrastructures.’

(Brennen & Kreis, 2016; p. 2).

Most academic contributions argue that digitization and a subsequent digitalization can offer tremendous benefits for industrial firms as they offer efficiency potentials as optimized process times (e.g. customer response times) as well as digitalization offering new propositions and therefore new potential value streams (Ritter, 2020; Ritter & Pedersen, 2020a). However, according to Ritter & Pedersen (2020a) both cannot be separately regarded, and a more integrative approach is preferred as:

‘…digitization capability is the organizational building block on which digital business model is based.’

(Ritter & Pedersen 2020a; p. 187).

Consequently, firms need to digitize first to being able to digitalise. Therefore, even though digitization may lift efficiency gains on its own it is the very basis for digitalization activities which in contrast cannot sustain without digitization. Resulting it can be claimed that the degree of digitization of a firm is arguably possible influencing factor of further digitalization activities.

2.4.1 Technology and Relationship Management

Even with the term ‘digitalization’ often used a general manner, the impact can be determined on several levels (Ritter & Pedersen, 2020a). Within their study of B2B networks being impacted by technology, Pagani and Pardo (2017) suggest a digitalization impact framework along a so-called Actor-Resource-Activity logic (Håkansson & Johanson, 1992). The so-called ARA model proposes three layers: activity links, resource ties and actor bonds to describe different types of business exchanges (see Figure 11). Activities could be any acts directed towards a purpose as processing information, developing a product, selling, or purchasing. Resources sustain such activities and could

consist of physical facilities, raw materials, operating systems etc. Actors within the ARA model can be organizations or individuals that interact with others to link activities and to combine resources (Lenney & Easton, 2009). From the ARA model analysis by Pagani & Pardo (2017) the following three digital technology impact types emerged.

First, the ‘activity-links-centred type’ of digitalization, where the digital resource is used in order to optimize activities that are already existing by increasing their quality and/or lowering costs. In this respect, an electronic resource planning system (ERP) does not change the very nature of a purchase activity between actors but allows a more efficient way of processing it (Senaya et al., 2022).

Second, the ‘resource-ties-centred type’ of digitalization, which is mainly characterized by the creation of a new activity that is carried out between known actors meaning that activities are based on a previously established relation. Examples of this would be digital ecosystems e.g. networked products that communicate with the manufacturing company about their usage on that basis new services can be proposed (Senoner et al., 2022).

Third, the type that support new bonds between actors is called ‘actor-bond-centred type’. According to Pagani and Pardo (2017) this is the case when the digital systems allow actors to connect to other actors and form new connections that where not there before as a marketplace platform of knowledge exchange.

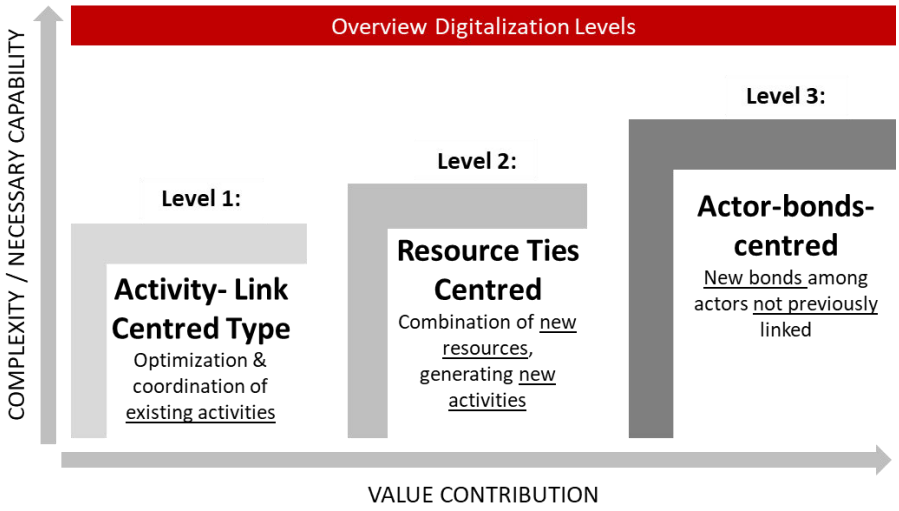


Figure 11: Roles and Types of Technology by Pagani & Pardo (2017).

In this sense technology in form of digitalization is more than just hardware, software, and transmission of data. The key role of technology is to provide information, communication, as well establishing the basis of combining existing resources to make established processes more efficient or even to create new exchanges. Technology in form of digitalization could be used to standardize, transactionalize, as well as relationalize service (Huang & Rust, 2018). Rafaeli et al. (2017) conceptualizes this by proposing a technology evolution framework with three components. One component would be the technology for 'standardization' and automation' to enhance productivity (Efficiency Perspective). Early examples would comprise self-service counters like ATM's or robotics to perform physical tasks (Colby et al., 2016). More recent examples would be automated digital bots performing standardised task formerly performed by humans (Boute et al., 2022). The second component would be to use technology for 'personalization' reasons e.g. identifying personal needs as well as preferences and to tailor accordingly any service offers (Riegger et al., 2021). The third component is to use technology for 'relationalization' meaning that the collection of information via technology is used for building up new relationships as well as strengthening existing relationships (Reis et al., 2021). Comparing the framework proposed by Rafaeli et al. (2017) with the approach suggested by Pagani and Pardo (2017) it becomes clear that possible roles of technology are similar conceptualized implying the importance of the concept as well as the need of differentiating them. In addition, it becomes evident to consider in what stage within the digital maturity curve an organisation and its customers is.

2.4.2 Organisational- and Individual Level Aspects of Technology

Technology can be seen from different perspectives and on an organizational as well as individual level. With regard to organizational levels the Technology-Organization-Environment (TOE) framework, originally developed in the 1990 by Tomatzky and Fleischer (1990), proposes three types of factors that affect the adoption of technology innovation: environmental context (market structure

and industry characteristics; government regulations), technological context (characteristics and availability of technology) and organizational context as communication processes, firm size, complexity of managerial structures (Sila, 2015 & Figure 12).

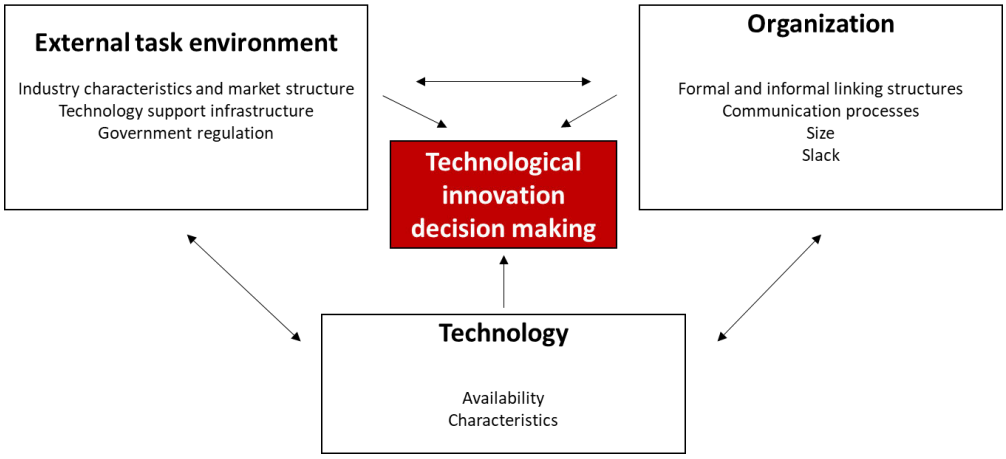


Figure 12: Technical, Organizational and Environmental Adoption Model by Tomatzky & Fleischer (1990)

Regarding the 'technological context', TOE has been used to explore the diffusion and adaptation of various information system innovations along different levels as supporting business administration, core business applications as well as technical tasks (Sila, 2015; Swanson, 1994). In the literature several enabling elements have been identified for a successful information system integrations, one being the availability of technology resources as infrastructure, others technical skills and capabilities of staff, plus user- and additional developer time (Sila, 2015). Even though the literature highlights the wide usage of TOE (Sila, 2013 & 2015), the specific factors within each characteristic dimension (environmental, technological, and organizational characteristic) vary across studies (Teo et al., 2006 & 2009).

In their study of adoptions factors of e-commerce, Sila (2013) operationalizes the 'technological context' by including complexity, data security, cost, network reliability and scalability. Asare et al. (2016), in their study of supply chain technology adoption, consider additional elements like compatibility, observability, testability, and relative advantage of technology. The 'organizational context' has been conceptualized differently throughout literature

including business size, CEO characteristics and employee information system knowledge (Iacovou et al., 1995), as well as the importance of internal top management support for technology adoption (Asare et al., 2016; Premkumar & Ramamurthy, 1995; Sila, 2013). The 'environmental context' has been operationalized by factors like external pressure (Iacovou et al., 1995), competitive pressures, as well as exercised power (Premkumar & Ramamurthy, 1995), and perceived government and industry pressures (Asare et al., 2016). Besides the broad usage of TOE among researchers there are also some limitations of TOE to be found. Gibbs and Kramer (2004) point out that the TOE model does not incorporate inter-firm factors as trust as identified as important variables in other studies (Hart & Saunders, 1997). Interestingly, even with not having incorporate trust in the original TOE model, there are studies that use a TOE framework as a basis and add trust or other variables (Asare et al., 2016; Sila, 2013). This flexible adding or removing of adoption elements within the TOE framework has been claimed to be one of the main reasons why an evolution as well as change since the initial development is lacking (Baker, 2012). This is in line with argumentation of Zhu and Kraemer (2005) that describe TOE as a generic theory rather that a fixed adoption model. Baker (2012) sees this adaptable flexibility of TOE more as an advantage rather than a limitation by saying:

'The freedom to vary the factors or measures for each new research context makes the TOE framework highly adaptable. Thus, scholars have seen little need to adjust or refine the theory itself.'

(Baker, 2012; p. 12).

However, besides the increasing sophistication of technology adoption models, as the TOE, focussing on organizational aspects alone may not capture a complete view of 'how' technology is adopted (Tscherning, 2012). Literature proposes to engage in multilevel research to address different levels of theory and to complement macro-aspects on an organizational level with micro-aspects on individual level to capture the complexity of technology adoption (Liu & Hung, 2021; Tscherning, 2012). This seems even more vital as the actors behind business relationships are individuals that can appear on single

individual level as subject matter experts, decision makers, as well within constructs of buying centres as a combination of different roles. In this respect, Pozzi et al. (2014) argue that technology constraints and affordances theory can help to better understand how organizations and individuals use technology, as well as how this might affect their performance.

Research at an organizational level can be considered as meso-level aiming to understand and interpret organizational level characteristics and its dynamics; research at an individual level aims to seek understanding of individual's thoughts, behaviour and feeling (Liu & Hung, 2021). It can be stated that there is a strong need for theoretical frameworks in this space which has been recently echoed in the literature (Shree et al., 2021).

On the one hand, the adoption of technology within organizational settings and beyond as for example with digital platforms has to be better understood. Studies within the last decade have primarily focused on performance factors of digital platforms (Chang et al., 2020; Liu et al., 2020), high-level antecedents of adoption from a seller and buyer side (Vize et al., 2013), and factors affecting digitalization choice (Penttinen et al., 2018). However, most of these studies are bound to specific context and are claimed not to provide a detailed understanding of the underlying phenomenon as theoretical underpinnings are missing (Shree et al., 2021). On the other hand, most of the studies employed within B2B service platform space have been studied from a technical rather managerial perspective leaving out aspects of organizational decision making, focussing pre-dominantly on technical challenges (Chakravarty et al., 2014; Shree et al., 2021). Furthermore, the main part of the research activities on digital service platforms in B2B focus either on service client or -provider side, with very scarce studies that take dyadic relationships within their considerations (Jiang et al., 2019). Finally, there is a notion in the literature that knowledge about critical factors within digitalization project management, and the successful adoption of digital is still lacking and suggested as one major future research stream (Shree at al., 2021; Thitimajshima et al., 2018).

2.5 Services in Business-to-Business

In general, services are regarded as source of differentiation and innovation in the B2B environment which is more and more characterized by product commoditization (Lilien, 2016). Technological developments add sets of new capabilities and with-it possibilities for services, where new logics prevail (Ritter & Pedersen, 2020a). This section will give an account of different aspect of services in B2B with a focus of linking it to relationship management and digitalization.

2.5.1 Business-to-Business Service Types

According to Pekkarinen and Ulkuniemi (2008) business services should be regarded as objects of processual exchange in which value is created for the service provider and their customers throughout an interactive relationship. Even with this broad definition of service other more detailed definitions can be found.

One classic distinction offered by Grönroos (1979) is to classify services as ‘consumer services’, that are sold to individual household and individual ‘private’ customers, and services that are provided to industry and institutions referred to as ‘producer- or industrial services’.

Within a B2B setting Homburg and Garbe (1999) specified Grönroos’ (1979) definition in more detail by using the term ‘business services’ instead of ‘industrial services’ as the latter are commonly referred to manufacturing companies selling to organizational institutions only (see Figure 13). In addition, they offered a wide spectrum of business service- and sub service class classifications as the differentiation between ‘Professional Services’ and ‘Industrial Services’.

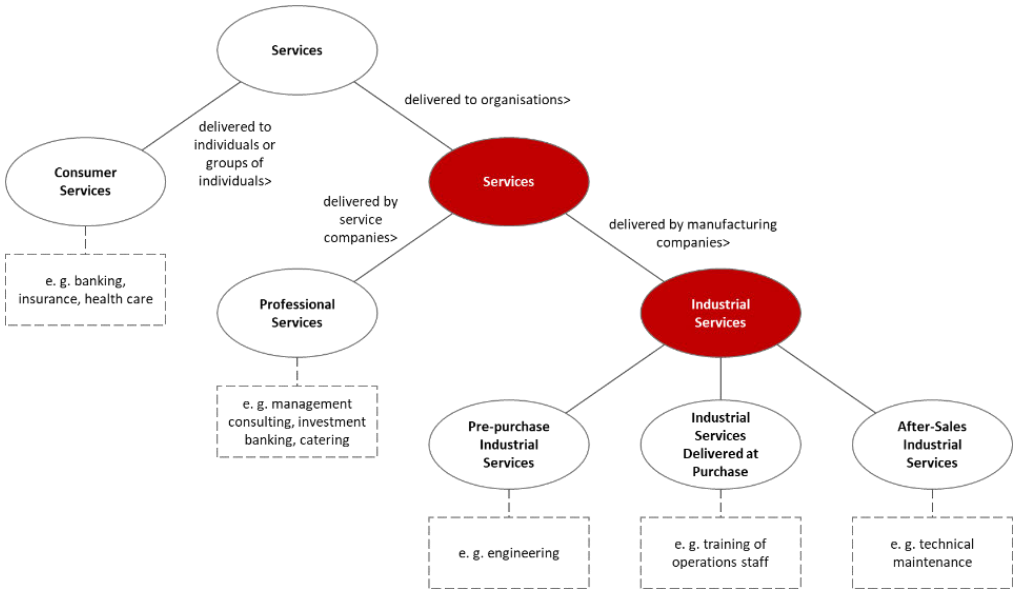


Figure 13: Taxonomy of Services by Homburg & Garbe (1999)

Within service and e-service literature there is a common understanding among scholars and practitioner that technology has been one of the pivotal driving forces behind the rapid progress of nowadays service offerings leading to complete new service models under the umbrella of 'digital servitization' (Rust & Huang, 2014). Paschou et al. (2017) define the concept of technological infused products and services with their connected possibilities as a:

'… new layer of connected intelligence that automates process, transforms data, and augments the actions of the organizations enabling companies providing PSS (Product Service Systems).'

(Paschou et al., 2017; p. 4).

There are scholars that argue that within this digital servitization information and communication technologies (ICT) are integral part of the growing number of services (Chae et al., 2014; Richter & Pedersen, 2020a). Some go as far to say that the 'service revolution' of the last years and the 'information revolution' can be considered *as:*

'… two sides of the same coin.'

(Rust & Huang, 2014; p. 206).

In this sense, the introduction of digital technologies has been identified to increase service delivery efficiency by using technology and to enable new

technology infused service offerings in addition or stand alone to traditional services and is a key research priority in service operations (Adrodegari et al., 2017; Victorino et al., 2018). Interestingly, and contrary to common belief, this use of technology enables the outsourcing of assets, processes, and activities of B2B firms and is one driving force that explains most of the service sector growth globally (Wirtz & Kowalkowski, 2022; Wirtz, 2015).

With regard to examples in that space Car-to-Go is such a representative example of a technology infused service offering. Car-to-Go offers a free-floating car sharing service as an alternative to self-owned cars, where the car as a physical object is offered as a 'service' and the customer as car-service consumer manages service process using it on its own in a self-service approach (Schulte & Voss, 2015). Within an B2B setting the concept of Rolls-Royce Aerospace, the turbine manufacturer not to be confused with the car producer, of 'power by the hour' can be mentioned, where the B2B customers do not acquire the turbines as physical products but they are charged by the actual hours of usage including all maintenance costs (Baines, 2015).

With the presented examples it appears relevant to use a B2B service definition that takes account of this new aspect of services on the outline more traditional service definition as outlined above.

In their empirical study of B2B service categories Raddats (2011 & 2018) proposes a new typology of three distinct service type e.g. discrete services, product lifecycle services and output-based services (see Figure 14).

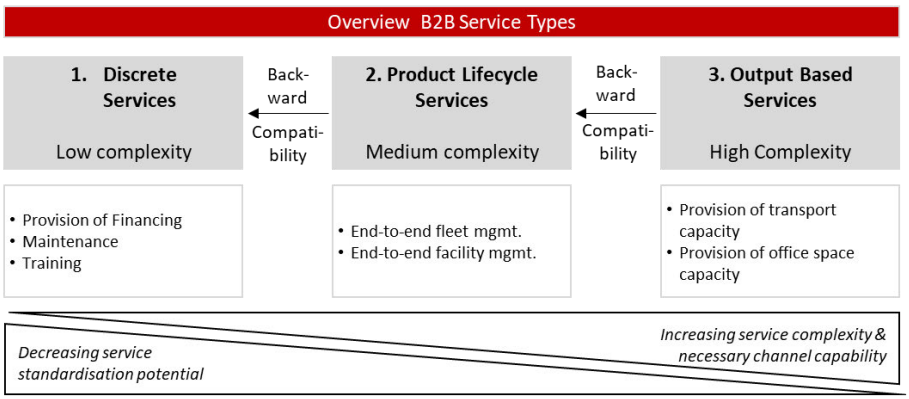


Figure 14: B2B Service Typology by Raddats and Easingwood (2010)

‘Discrete services’ can be offered in combinations or individually and are in line with typology of Homburgh and Garbe (1999) for example equipment installation, maintenance, and training. ‘Product lifecycle services’ are seeking higher service revenue across the customer lifecycle (Sawhney, 2006). Services like this would include outsourcing product-based activities as business case modelling for banks managing their cash-cycles or managing end-to-end car fleets for a logistic company. In this sense, product lifecycle services are regarded as more valuable as discrete services and output-based solutions are claimed to be the most valuable services. They differentiate from product lifecycle services as outsourcing is more of holistic nature often including a multiple vendor product (Raddats & Burton, 2014). Examples of output-based solutions would be entire business process outsourcings as infrastructure management of data centres in a way that data storage space is available. Or taking the car fleet example it would not be the management of an existing physical car fleet but the provisioning of transport capacity. A noteworthy issue outlined by Raddats and Easingwood (2010) is the ‘backward compatibility’, in other words as most firms will try to move their customers up the service type staircase to increase value, they are likely to supply as well service offers that demand less commitment from their customers if necessary. A company providing output-based services as transport capacity would also be offering discrete services as pure car maintenance. However, according to Raddats and Easingwood (2010) this process is not straightforward ‘forward compatible’ without significant change in service strategy and resource set-ups.

2.5.2 Business-to-Business Services and Relationship Management

The collaborative capability, meaning employing service as a relational resource, has been claimed to be key success driver in business (Lusch et al., 2006; Zeeshan et al., 2019). A claim also to be found within the network theory literature, where relational resources as service(s) are seen as vital for successful relationships, as well as the relationship marketing literature

emphasising the customer relationship (Gadde & Snehota, 2019; Gadde et al., 2003; Håkansson & Snehota, 1989).

Allmendinger and Lombreglia (2005) claim that a company's product is the possible starting point or 'gateway' to an extension range of services offered during the entire relationship lifecycle, starting from the customer's initial purchase of a product to its disposal. This is further supported by several sources that emphasize the aspect of product and relationship lifecycles as source of possible service opportunities (Bundschuh & Dezvane, 2003; Santos et al., 2017; Sawhney, 2006).

Besides positive effects of services on relationships, negative implications can be also found. Within research, service failures within B2B are to a large extent related to service outcome issues as late or incomplete deliveries (Lockshin et al., 1998; Tontini et al., 2017). This is in contrast with service failures in B2C environments, which are potentially much more linked to process dimension of in what way and how a service is delivered (Rita et al., 2019). Within the B2C domain service failures have been highlighted to be a potential opportunity to establish even stronger relationships and to delight consumers (Hays & Hill, 2001). In this sense, service problems do not need necessarily to be a disadvantage for the service providing company; instead it is claimed that it depends on the way 'how' a service problem is managed (Edvardsson et al., 2011; Zolkiewski et al., 2017).

Even with literature suggesting that service failures provide a possible opportunity of handling B2B relations, there is an agreement in the literature that service failures lead to costs both on the service receiver and -provider side (Hansen et al., 2008; Lockshin et al., 1998). In this sense, costs may materialize as customer dissatisfaction leading to negative word of mouth (Khuong et al., 2021). In addition, service provider competence might be questioned leading to no further business engagement. Furthermore, service receiver perception of relationship disruption might occur leading to negative downstream effects to other stakeholders of the value chain (Henneberg et al., 2009; Zhu & Zolkiewski, 2015).

However, even with the most part of the literature outlining the critical aspects of service failures, there is also research that suggest that if one or a limited

number of service failures occur, and it is perceived as unique scenario, most customers might be tolerant with occasional incidents (Low et al., 2013). Low et al. (2013) point out that each customer has a unique ‘tolerance zone’ which is formed by the expectations of the service and the actual output of the service received including a cost-benefit evaluation of the process. In contrast to the negative impacts of service failures, the literature has also pointed out that ‘buyer friendly’ service complaints can be a source of positively impacting relationship management (Hansen et al., 2008). In support of that, Homburg and Fürst (2005) discovered that a satisfactory handled service failure case has an effect on loyalty of customers. In many B2B environments, service propositions consist as a set of various processes and resources that interact with the processes and resources of the customer. Examples could be maintenance-, transportation-, and/or consultancy, as well as advisory services (Hübner et al., 2018). In strong contrast to individual B2C settings, such B2B service interactions are claimed to require much closer attention towards relational aspects (Coviello & Brodie, 2001; Kumar & Pansari, 2016). Reasons for that are manifold such as that possible service failures in B2B markets can have an amplified impact as not only the clients operations may be impacted but also their clients down the B2B value chain via so called ‘domino effects’ (Zhu & Zolkiewski, 2015). The current COVID-19 pandemic has massively caused such domino effects and had put several service providers in a very difficult, or even dreadful position to fulfil their business obligations (Baliga et al., 2020). In many instances, this has led to massive service failures and damaged services (Topline Strategy, 2020).

2.6 The Role of Digitalization in Business-to-Business

Digitalization can be seen as a pervasive force in the economic marketplace having as well an outstanding role in academic research. However, much of academic research has focussed on B2C marketing as mobile retailing (Pagani et al., 2017), online reviews (Sparks & Browning, 2011), gamification (Hofacker et al., 2016), and online communities (Park et al., 2018). Besides the need in practice to get hands on guidance on what digitalization really means for B2B

there are more recent academic developments that hold considerable promise for potential of digitalization in B2B in general and more specific within relationship management such as innovation networks, servitization, and relationship dynamism (Hofacker et al., 2020; Kannan, 2017).

2.6.1 Digitalization and Innovation-Networks

Innovation networks can be described as loosely coupled interactions of autonomous firms where members engage in joined activities ranging from research and development to commercialization and diffusion of new propositions (Dodgson et al., 2008; Dodgson & Gann, 2018). Recent research from the innovation domain indicates that digitalization can add significant benefits for innovation networks on several levels. First, communication costs can be lowered as well as scope and reach of communication formats increased by using communication and collaboration networks (Tan et al., 2020; Yaqub et al., 2020). Second, digital technologies in form of digitalization can facilitate network knowledge heterogeneity by using scope of digital tooling to transmit knowledge as well as to receive feedback. In this respect, digitalization enables a network to lift potential of crowd intelligence by integration network partners and their knowledge (Zhou et al., 2018). Examples of innovation networks would include the new space sector industry in Scotland (Vidmar et al., 2020).

2.6.2 Digitalization and Servitization

Following the research insights of Hofacker et al. (2020) servitization can be described as a trend as well as transformative business process in B2B that goes in line with digitalization mainly within the manufacturing environment (Coreynen et al., 2017; Zhang & Banerji, 2017). On the one hand, it is a trend as B2B markets, traditionally populated by firms offering a stand-alone product centred customer value proposition, extend these propositions more and more by the addition of services (Benedettini et al., 2017). By doing so servitization can improve a firms' differentiation capabilities by creating additional value for

customers by diversifying existing portfolios and with it offering a balance of products and services (Visnic & Van Looy, 2013). On the other hand, servitization often goes along with digital technology that has the potential to disrupt the way products and services are designed and processed (Hofacker et al., 2020; Vendrell-Herrero et al., 2015). There is a growing stream of research that examines the potential of servitized products and the role of digitalization within (Vendrell-Herrero et al., 2017).

Digital technology infused services (digital servitization) can be defined as a digital service offering that is based on a physical product (see Figure 15).

However, besides offering new differentiation potentials, digital servitization comes along with some challenges.

First, from an organisation capability perspective, implementing services in product dominated firms has been identified as one of the key challenges as other realisation logics prevail and different capabilities are required in order to design, implement, and execute service offerings; even more when this goes along with digital technologies (Kowalkowski et al., 2017; Kowalkowski et al., 2015).

Second, on a proposition level, digital services could substitute or cannibalize traditional service as in-person service hotline is replaced by self-servicing webpage or similar (Scherer et al., 2015).

Third, taking a financial performance perspective, after being created, digital services usually have only low-cost volume of producing a new service item. While this would be beneficially from a service provider perception, as less costs are incurred for the same or comparable proposition, from a service consumer perspective, research has identified that a digital service might reduce the customers' value perception (Rifkin, 2014).

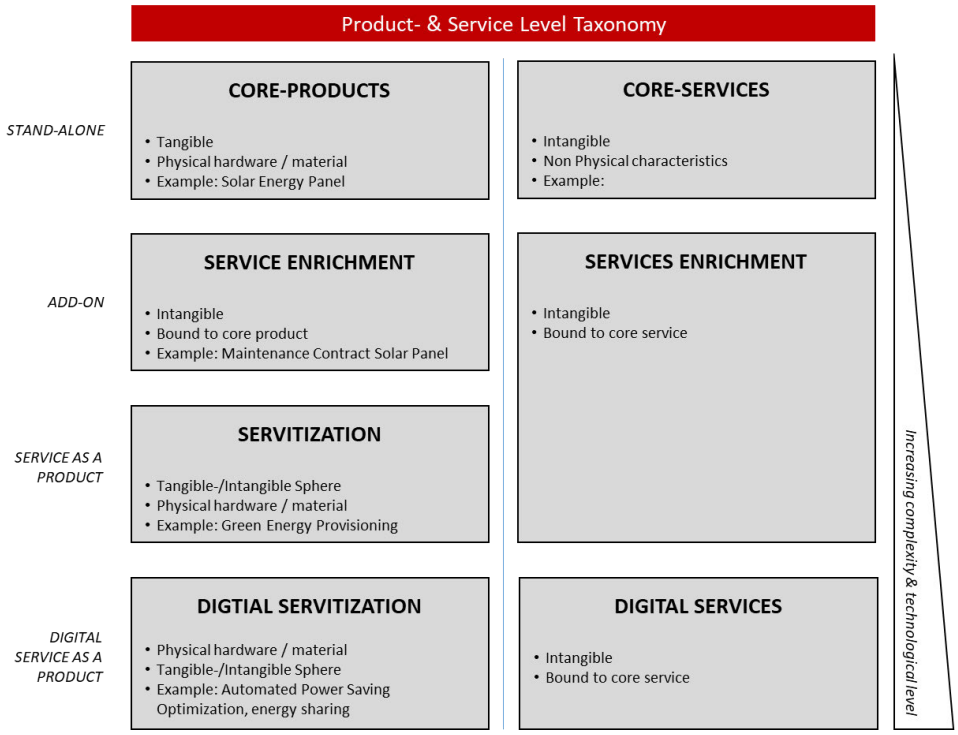


Figure 15: Product, Service, Servitization Classification

To conclude, B2B firms must assess these challenges to decide that digitalization endeavours in their service settings holds the intended promises (Hofacker et al., 2020). However, finding solutions to these challenges offers a huge differentiation potential even with servitization is being generally regarded an investment intensive endeavour with scalability and productivity as common challenges (Kowalkowski et al., 2017). To tackle these challenges several future research roads have been recently stated in the literature. Research is needed on how B2B firms engage in servitization, how they strategically approach their environment, engage, and initiate in the reconfiguration of their organisational assets (Wirtz & Kowalkowski, 2022). Other proposed future fields of engagements found in the literature range from understanding the ability of an organization to strategically decide on what business activities can be servitized or not, up to what challenges and learnings might arise when doing so (Penttilä et al., 2020; Wirtz & Kowalkowski, 2022). What is seen as future promising research avenues for servitization in general is also echoed for digital servitization. The literature in digital servitization has scarcely investigated what challenges arise, how such processes unfold in general, and it is missing a

general understanding on what are the key activities, phases, roles, and how value is generated in detail (Parida et al., 2019).

A main topic that arises in this context is the role of organizational culture within digital servitization. It is claimed that for numerous engineering-intensive companies it has been highly problematic to mentally switch from selling hardware equipment to intangible aftersales service, even more if they are digital. Therefore, a much deeper understanding of how a culture in favour for such changes can be instilled is pointed out as a research necessity (Annarelli et al., 2021; Parida et al., 2019). Besides culture another challenge highlighted throughout the literature is a firms digital integration capability. On a general level, integration capabilities can be sub-divided into two main research streams, digitalization enabled channel integration and integration of processes and data for mass customization (Annarelli et al., 2021). Oh et al. (2012) defined channel integration capability as a:

'…firms ability to use IT in integrating cross-functional channel resources and operations in service delivery systems.'

(Oh et al., 2012; p. 370).

With respect to mass-customization the concept of digitalization capabilities is highlighted by several authors as a way to integrate production systems and information systems in increase performance (Annarelli et al., 2021; Bharadwaj et al., 2007; Dean et al., 2009). However, even with research in these fields the unified corpus of academic research of digitalization capabilities still has to be developed. In this respect, Annarelli et al. (2021) point out the following key future research directions on digitalization capabilities based on a systematic literature review of 249 articles:

'1. Theory building and theory testing studies on digital integration capabilities and on digitalization capabilities representative of dynamic capabilities characteristics;

2. Approaches, mechanisms, activities and processes resulting in the implementation of digital platforms and the development of digital platforms capabilities;

3. Empirical studies on the development and exploitation of drivers to digitalization transformation;

4. Correct balance of resources to be allocated in developing digitalization capabilities, according the specific competitive needs of companies;

5. The nature of digital innovation and related digital innovation capabilities;

6. The effects of digital innovation and related capabilities in determining competitive advantage.'

(Annareli et al., 2021; p. 12).

2.6.3 Digitalization and Relationship–Dynamics

Relationship dynamics can be described as the sum of interactions of two or more individuals that interact across and within organizational boundaries on a dynamic basis (Palmatier et al., 2013; Shamsollahi et al., 2020). This dynamism is one of the central tenets of B2B relations which instead of being linear having their ups and downs over time (see Section 2.3.2). In this respect, firms and their representatives experience constantly changing experiences throughout time and digital elements within these experiences such as social media platforms have the potential to inform how relationship dynamics take shape (Hofacker et al., 2020).

Much of scholarly attention has been to the development of business relationships (see Table 3) and it accepted in the literature that digitalization has tremendously changed how business relationships are developed throughout different stages over time, acting as a direct force in relationship dynamics (Vendrell-Herrero et al., 2015). In this respect, the digitalization of business relationships can be defined as the process of making business information, activities, as well as offerings related to exchanges between two or more forms digital (Salo, 2017). This process can happen on different levels or as a combination of them. One level could be the digital infrastructure as a structural element that is added to the traditional seller-buyer relationship (Salo et al., 2020). The impact of digital infrastructure is reinforced when repeated investment are made in digital technologies that facilitate the exchange of

information as supply or production chain data (Salo et al., 2020). However, as a business relationship digitalization is more than just infrastructure-based factors, other elements could be on a communication or other level.

Digital communication can facilitate, enhance, and intensify inter-personal communication up to a level that face-to-face contacts are completely replaced (Salo et al., 2020). In this respect, social interaction can be more intense and focussed when mundane work such using physical mail or fax for communication of documents is abolished by using digital infrastructure such as internet or inter-company virtual private network applications. Salo et al. (2020) propose that such process and structural digitalization specific outcomes can be classified in virtuous and vicious cycles of digitalization. Virtuous cycles occur when firms efficiently and effectively use digital technology to speed up process elements and with-it yielding benefits of digitalization. Vicious cycles occur when expectations of digitization efforts are not met.

B2B relationship digitalization has the potential to yield major benefits ranging from lower transactional costs up to increased customer value as new proposition are created with the help of technology (Ramaseshan et al., 2015; Salo, 2008). Such transaction cost reductions are lifted when upstream and downstream supply chain partners connect directly blurring the boundaries between supplier and customer firms (Pagani & Pardo, 2017).

However, relationship digitalization inherits several pitfalls and its possible impact must be understood and managed.

Singh et al. (2017) identified that digitalization has the potential to eliminate the need of human intervention and therefore directly impacting relationship dynamics. What can be seen as a benefit for the sales organization, as less costs are incurred, could have the opposite impact on the customer side leading to possible service failures when customers' expectations are not met by the digitalization activity (Forbes, 2020; Liu & Hung, 2021). However, there are also examples that indicate that the opposite is the case; Forrester Consulting (2017) identified that 60% of companies prefer a digitalized solution and not to interact with a sales representative.

2.6.4 Digitalization and Service Business Model Innovation

Numerous studies have pointed out that 21st century business innovations are massively influenced by the utilization of digital technologies (Laudien & Pesch, 2019; Newell & Marabelli, 2015). With the unlimited availability of data, companies have the possibility to innovate their business processes by using data as a new currency to fuel their knowledge and resource base (Brynjolfsson & McAfee, 2012). Implementing digital technologies and with-it digitalizing business streams can help companies to overcome the traditional business constraints that are related to service. In this respect, utilizing digital technologies can help firms to tremendously speed up service processes as well as disentangle the assumed linkage between service and human activities. In other words, formerly in-person services as hotel consultation and reservation services are now being delivered by technology platforms (Laudien & Pesch, 2019). However, introducing service innovations seems to be heterogeneous with companies deciding on diverse strategies having different underlying motivations (see Figure 1). Laudien and Pesch (2019) identified four archetypes of digital business models in service firms: (1) Digital beginner service firms, (2) Customization-focused service firms, (3) Distance bridging service firms, and (4) Full scale digital service firm.

Within ‘digital beginners service firms’ digital technologies do not add value to service delivery in a relevant way. Digital technologies might be used as a substitute for analogue technology, but the core process is not changed at all. Examples would be online booking for service appointment instead of calling a service desk as offered by Shore.com, a German start-up offering appointment management cloud platform (Widhalm et al., 2015). In general, no customer data is used to enhance value capture.

‘Customization-focussed service firms’ focus on value creation within an integrative approach with their customers using digital technologies to identify customer needs and wishes. Such firms have different approaches to utilize customer data by having a strong emphasize to use data in accordance with existing data privacy regulations, in other words offering dedicated time slots for

delivery or customization of product features within certain limits. An example would be United Parcel Services (UPS), a world-wide operating logistic organisation, offering individualised delivery slots and adjacent services as insurance services (Jain et al., 2017).

‘Distance bridging service firms’ utilize digital technologies to bridge geographical as well as communication distances as for example translation services integrating service partners within the whole service value chain. Rosetta-Stone would be an example, a multinational language service provider offering B2B language courses with native speakers via video conferencing from all geographical zones bridging distance and time zones by integrating computer assisted language learning offerings (Bajorek, 2017).

‘Full scale digital service firms’ rely on fully digital value creation. In general, such firms rely on freelancers instead of having a team of full-time employees. Fully automated processes are at the core of their business model as for example with machine-to-machine integration. Both factors make such organizational set-ups supposedly more flexible and cost-efficient. Firms like that are also characterized by co-creation, often combined with simultaneous work on same programme or projects, empowered by technology where offline delivery is not part of business. Noteworthy examples would be business intelligence services as the combination of freelance analysts and research engine technology as offered by Gartner and Forrester, two multinational research service companies (Sun et al., 2018).

2.7 The Concept of Value

The creation of value is becoming a more and more prominent theme in research additionally fuelled by the ‘networked economy’, meaning the creation of services and products through social networks on large scales, that becomes more and more pervasive (Gassmann & Ferrandina, 2021; Kohtamäki & Rajala, 2016). The purpose of this section is to introduce the concept of ‘value’ in general as it is seen as a foundational element in marketing research. In addition, linking it more concretely to Business-to-Business, relationship

management, and digitalization sphere seems important as they are the underlying fields of this research project.

Value theory has been a focus in marketing research during the last decades as generating value is seen as the principal motivation when engaging in transactional activities within the B2C and B2B space (Eggert et al., 2019). However, value is claimed to be a highly complex, consisting of several dimensions being influenced by multiple factors. Therefore, conceptualizing value and grounding it in this research project is the intention within the next pages.

Practioneers as well as scholars in the field of B2C and B2B agree that 'value' is a fundamental concept of the marketing discipline as for example indicated in the American Marketing Association that define 'marketing' as:

'... the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.'

(American Marketing Association, 2017).

In this respect and in line with research of Woodruff (1997), 'value' on a general level can be seen as:

'… a customer's perceived preference for, and evaluation of, those product attributes, attribute performances, and consequences that arise from use and that facilitate, or block, the customers in achieving their goals and purposes in use.'

(Woodruff, 1997; p. 142).

In this respect, the concept of value has been claimed to be crucial in business management along different buying behaviour dimensions out of several reasons.

First, according to Gallarza et al. (2011) value has an economic dimension, where perceived price is linked to value what is commonly known as transaction as well as a psychological dimension that influences the brand-, product-, and ultimately purchase choice.

Second, in addition to perceived price and psychological dimensions, value is claimed to be inextricably linked to other marketing related themes. Examples range from customer satisfaction and service quality to the dichotomy of acquisition value and transaction value as it relates to different perceptions of products, services and their price (Al-Sabbahy et al., 2004; Soni & Dawra, 2019).

Third, the literature states that the concept of value is recognized as one of the fundamental elements to the understanding of marketing and with-it business management as it helps to explain consumer behaviour that occurs after or even before the purchase (Steward et al., 2019; Zeithaml, 1988), repeat purchase (King et al., 2016; Nilson, 1992), or purchase intention (Alalwan, 2018; Dodds & Monroe, 1985).

Fourth, some authors go as far to propose that there is even an ethical justification for value that stems from the connection between value concepts and marketing activities (Gallarza et al., 2011). Following this argumentation, Holbrook (1994) claims that if an exchange is viewed as a:

'… transaction involving two agents in which each agent gives up something of value in return for something of greater value.'

(Holbrook, 1994; p. 22).

then it can be concluded that marketing activities are in a sense socially justified because each party is better off after having fulfilled the exchange. In this respect:

'… companies that measure value … will make a superior contribution to society.'

(Gale et al., 1994; p. 15).

as *'… improving the perceived value of products and services increases the total standard of living.'*

(Nilson, 1992; p. 176).

Despite this importance of value that is echoed in the literature as stated above there is a notion amongst scholars that there is a lack of clarity surrounding the

concept of value especially in the B2B environment (Eggert et al., 2018). Reviews of established marketing literature have summarized existent value research on a broad scale (Ellegaard et al., 2014; Lindgreen et al., 2012; Lindgreen et al., 2012; Minerbo & Brito, 2021); however there remains:

' … a general feeling among academics and practitioners that suggests we have only just begun to understand what 'value' means.'

(Lindgreen et al., 2012; p. 4).

Throughout the history of economic research, the meaning of value has been conceptualized diversely maybe with the most fundamental distinction having been made between subjective and objective concepts of value. Already back in the 18th century Adam Smith recognized two essentially different conceptualizations of the term 'value':

'The word value, it is to be observed, has two different meanings and sometimes expresses the utility of a particular object, and sometimes the power of purchasing other goods which the possession of that object conveys. The one may be called 'value in use', the other 'value in exchange'.'

(Smith, 1776; p. 42).

'Value in use' is the contribution to the objective achievement meaning 'utility' and with-it signifying a more subjective conceptualization of value (Eggert et al., 2019). 'Value in exchange', which is reflected in market prices, represents more the objective conceptualization of the term value i.e. as the power of purchasing a service or product (see Figure 16).

An example would be a product such as a 'scissors'. The scissors can be seen as a cumulation of forged iron and its material value which is produced for a cost factor of X and sold with a margin at a price Y market value (Value in exchange). This scissor for a hairdresser can be seen as fundamental part of his business model of cutting hairs as this very scissor costing the price Y will be used in hundreds and thousands of haircuts which cannot be done without it (value in use). On the other hand, the same scissor could be used to open paper letters once every week or month in a standard household, or might not

be utilized at all if put on the exhibition shelf of a scissor collector, fulfilling other purposes and hence providing quite different value.

In this respect the same scissor, even when having the same ‘value in exchange’ at a market price Y, can have a very different subjective ‘value in use’ depending on the corresponding actor and his value perspective.

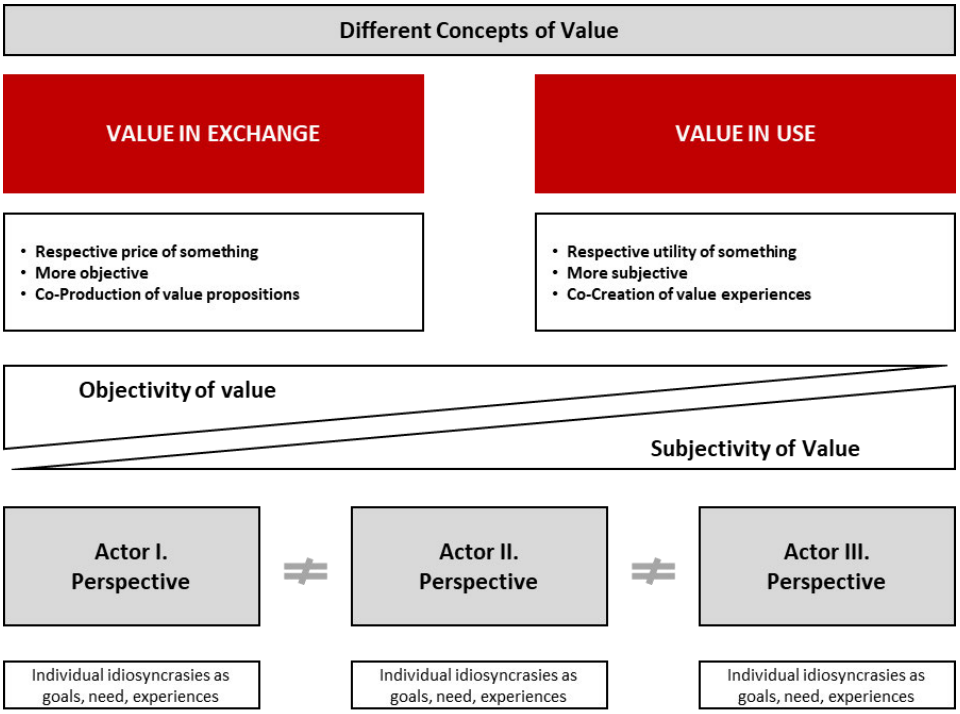


Figure 16: Different Concepts of Value

Marketing theory has understood and used such examples for long conceptualizing ‘value’ as a perceptual construct that is both context and actor specific (Corsaro & Snehota, 2010; Eggert et al., 2019) and therefore always claimed to be subjective as outlined throughout literature (Minerbo & Brito, 2021; Woodruff, 1997; Zeithaml, 1988). However, even with being subjective, the underlying intended objective achievement can be seen as the central motivating force that drives behaviour (Peterman, 1997; Xia & Bechwati, 2021). As a consequence, the subjective value perception of the degree of objective achievement that is reached by an item (as a service or product) can be argued to be at the very centre of any value judgement (Eggert et al., 2019).

In line with the contextual- and phenomenological character of value and its subjective nature, Vargo and Lusch (2016) recently acknowledged within their Service-Dominant also called S-D logic that from a service perspective:

'… value is always uniquely and phenomenologically determined by the beneficiary.'

(Vargo & Lusch, 2016; p. 18).

They claim that the very origin of all value considerations are 'idiosyncratic dispositions' (something peculiar to an individual as character or capability). Such idiosyncratic dispositions are shaped by the sum of different experiences an individual has made. Consequently, as each individual has made different experiences it is important to highlight that actors might experience and assess the potential value of a service, a product, or a relationship differently based on the different experiences they have made.

Therefore, the role of the actor is a very crucial one when conceptualizing value appraisals in B2C and B2B. However, is not just the actor's subjective perception which might appear at first hand static and given due to the idiosyncratic elements and experiences made as outlined above. Actors can also play a collaborative, active, and endogenous role during the 'value in use' phase often referred to in the literature as 'value co-creation' due to their dynamic character as well interactive value formation (IVF) capability (Echeverri & Skålén, 2011; Tregua et al., 2021; Vargo & Lusch, 2008). Managing such collaborative situations has been identified as an additional challenge for service providers as they have to ensure that their current or prospecting customers engage in such value co-creation activities always with the Damocles sword at present that such engagements bear the risk of value co-destruction or other downsides of value formation (Echeverri & Skålén, 2011 & 2021).

According to Luyen et al. (2022) this seems to be especially the case when prolonged and complex services are embedded with technology as for example in self-service environments, where additional layers of complexity on the top of the underlying service can arise and customers need additional capabilities as technological understanding to exercise their co-creation role (Appiah et al.,

2021; Bagozzi, 2007). In such settings like online banking or online hotel bookings, which can be seen as a strong shift to technologically empowered self-service, user ambiguity can possible arise as customers may appreciate the potential benefits of such a self-service tool but at the same time need to exert more time and effort to reach their objective achievement (Johnson et al., 2008).

In the literature Haumann et al. (2015) refer to this phenomenon within coproduction processes as ‘consumer intensity’ - in other words the degree to which actors bring in or must bring in certain capabilities. Consequently, due to the different idiosyncratic elements of actors and their experiences, paradoxical actor experiences of the same service are more common. This can go as far that if an actor does not have the necessary capability to engage in an interactive value formation, or seeing it as too resource intense, such settings bear the risk of value co-destruction. In this respect, avoidance-based behaviours are potentially exercised that avoid or at least minimize interactions with such settings leading to less to no value creation (Baron et al., 2006; Graf-Vlachy et al., 2018; Johnson et al., 2008; Wilson-Nash & Tinson, 2021).

Highlighting the importance of customer intensity Luyen et al. (2022) propose to integrate this in the definition within the concept of ‘interactive value formation’ (IVF) of by stating that IVF is:

‘… a systemic interplay between resource integration based interactional processes driven by consumer intensity, which can encapsulate multiple value forming processes simultaneously, leading to the codetermination of value.’

(Luyen et al., 2022; p. 297).

Even with the importance or value of value having been argued in the literature there is a general agreement that researching value is difficult. Explanations for that are multitude ranging from the very nature of value as an abstract concept including different meanings and lack of consistency in value definitions and corresponding conceptual obstacles up to methodological problems as structure of value models, number of value dimensions, and uncertainty regarding the line between value and satisfaction that endanger the reliability of value measurements (Gallarza et al., 2011). Besides the challenges outlined value

research has expanded significantly establishing a rich variety of frameworks and concepts and will be subject in the next section.

Building and extending such concepts will be the intention of this research project to answer the need of further research in the field of value creation in B2B service value systems, service networks and service ecosystems (Kohtamäki & Rajala, 2016; Ostrom et al., 2015).

2.7.1 Business-to-Business and Value

Within the B2B marketing literature the concept of value is also polysemous, meaning that multiple definitions and perspectives exist (Gallarza et al., 2011; Galliers, 2011). Value is used in a wide range of settings ranging from the value of singular products, services, or entire customers; up to the creation and delivery of value of suppliers to buyers (Mencarelli & Riviere, 2015).

From a historical point of view the understanding of value in B2B markets has advanced from pure objects of exchange towards a more complex and holistic and therefore rather complicated views of actor interactions (Lindgreen et al., 2012). Such B2B actors can be organizations which are no homogeneous monoliths but instead consist of multiple dependent or independent companies of all sizes bringing in a certain complexity level when it comes to conducting business activities. In this context the question arises ‘who is the value beneficiary the individual or the collective?’. An example could be General Electric, a multinational conglomerate, consisting of several hundred subsidiaries deciding on one common telecommunication provider (Eggert et al., 2019).

The phenomenon of individual and/or collective value creation within decision-making processes has been researched under the term ‘buying centre’ within the organizational buying literature considering individual actors outside and inside a purchasing organization indirectly or directly being involved in the buying process (Kohtamäki & Rajala, 2016; Webster & Wind, 1972). This multi-actor perspective has been recently enriched by considering the customer side as well and its underlying organizational process (Raddats et al., 2019, Huber &

Kleinaltenkamp, 2018; Weiber & Kleinaltenkamp et al., 2017; MacDonald et al., 2016).

Kleinaltenkamp et al. (2017) define such constructs as the so called ‘usage centres’, which:

‘… comprises, from the perspective of a single actor, all resource integrators that draw on a focal resource within a usage process.’

(Kleinaltenkamp et al., 2017; p. 721).

However, as a single actor can be on the supplier or provider side the question arises if value perceptions and their underlying constructs are in both cases similar or can they differ? Within business markets supplier and customers are organizations that follow a similar logic when building value perceptions that consist of specific underlying goals and needs as well as a willingness to invest resources and capabilities (Eggert et al., 2019; Plinke & Wilkinson, 2015). In this respect, suppliers and customers develop expectations on the future benefits and possible costs incurred within the intended exchange.

Therefore, the trade-off between benefits and costs results in a set of exchange-ratios that reflect the expected value from a supplier and vice versa the expected value from a customer side (Eggert et al., 2019). Plinke and Wilkinson (2015) propose two conditions to realise such exchanges. First, each actor is taking into consideration all expected costs as well as benefits and will not engage voluntarily in any sort of alternative exchange that makes them worse. However, within B2B markets supplier and customers typically can choose from several alternatives (Kleinaltenkamp et al., 2017).

Consequently, supplier’s and customer’s exchange ratios must be perceived as superior or at least equal to their respective next best alternative. Following this logic, the second pre-requisite according to Plinke and Wilkinson (2015) is that neither the supplier nor the corresponding customer recognizes better, in other words more valuable alternatives when they engage within an exchange activity.

To judge the value of interactions in form of transactions, literature proposes to differentiate ‘expected value in use’ and ‘experienced value in use’ (see Figure 17).

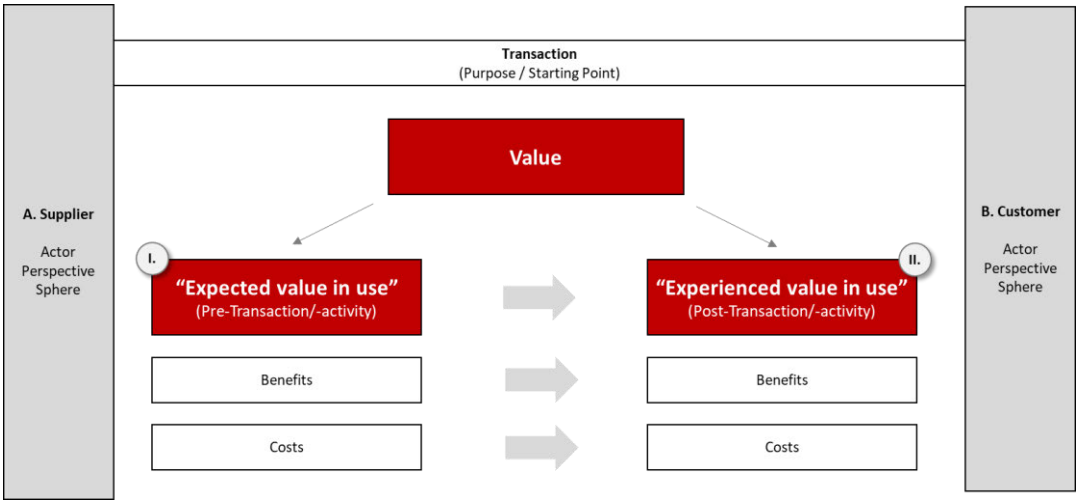


Figure 17: Expected and Experienced Value in Us’ Framework Adapted from Eggert et al. (2019)

‘Experienced value in use’ is the value of a supplier’s or customer’s purpose, outcome, or objective that originates from the usage of a specific product or service (Macdonald et al., 2011). The organizational buying literature usually adopts a customer’s perspective and explains how this perspective is conceptualized, what are the drivers behind, along which dimensions, and the corresponding effects on rebuy decisions and relational outcomes (Grönroos & Voima, 2013; Huber & Kleinaltenkamp, 2018). In this respect, ‘experienced value’ results from the quality of the resource integration process, supplier- as well as customer resource and actual received value (Macdonald et al., 2016). ‘Expected value in use’ consists of the future value expected or promised from a service and/or product and its attributes that customers and supplier offer in some kind of value proposition (Kullak et al., 2021; Payne et al., 2017). ‘Expected value’ in use reflects the actor’s evaluation of the perceived benefits based on a product or service offering that meets their value need as benefits expected and costs they are willing to invest (Kumar & Reinartz, 2016). Expected value in use can be therefore described as the monetary worth of social-, technical-, and economic benefits of a product or service proposition that an organization is receiving in exchange for a certain price (Anderson et al., 1998; Eggert et al., 2019). Consequently, it appears relevant to consider the

differentiation if ‘expected value in use’ and ‘experienced value’ in use as different actors based on their individual idiosyncrasies e.g. experience with some sort of product, service or not might have different perceptions which should be considered when creating a value proposition.

2.7.2 Business-to-Business and Relationship Value

Against the notion of taking a singular one-sided perspective (product-, supplier, or consumer-value perspective) within a limited set of activities as one single transaction in the past, value research has also adopted a dyadic relationship marketing approach (Eggert et al., 2006; Hussain et al., 2020). Early contributions on relationship value research trace back to proposals of Ravald and Grönroos (1996) as well as Wilson and Jantrania (1995). Ever since the topic has remained a heavily discussed phenomenon in research up to today due to the dynamic character of value and multitude of influencing factors such as technological or environmental developments (Hussain et al., 2020).

There are several highlights within the value and relationship research of the last decades that are worth to be pointed out.

Anderson (1995) describes the business relationship between two or more companies as a set of interwoven business strands in which each strand consists of a number of business episodes highlighting the temporal and connectedness of business exchanges each contributing to value. Raval and Grönroos (1996) take up this idea and connect it with the concept of value by stating that there needs to be a differentiation between ‘relationship value’ and ‘episode value’ given that a business relationship has several episodes and that the relationship value in total has a major effect on overall perceived customer value. Both depend on the specific context, as the relationship is evaluated as a whole instead of evaluating separate offerings. Flint et al. (2002) highlight the different perceptions of value by stakeholders in B2B that can materialize in:

‘… judgements or evaluations of what the customer perceives he has received from the seller.’

(Flint et al., 2002; p. 103).

In this respect, value perception and value creation are at the very essence of entering in business relationships and can be seen as epicentre of marketing and accepted source of competitive advantage (Hofacker et al., 2020; Kumar & Reinartz, 2016; Woodruff, 1997). Therefore, B2B relationship and marketing research has a very strong emphasis on value co-creation (Cossío-Silva et al., 2016), which can be seen as an interactive set of activities among customers and partners in the B2B domain that are aimed to create superior customer value (Hofacker et al., 2020; Ramaswamy & Ozcan, 2018).

There has been a growing recognition in academic research that superior customer value development can be a key differentiator in B2B exchanges and their underlying relationship management. However, this differentiator is not bound to objects of exchange as services or products but as the value of the exchange relationship itself (Tzempelikos, 2020). In this respect Ulaga and Eggert (2006) define 'relationship value' as a possible trade-off between the cost and benefits involved in a business exchange relation. In addition, Ulaga and Eggert (2006) proposed that this exchange logic happens on different level e.g. a firm's internal operations, core offering and sourcing process) with personal interactions being the strongest differentiator. In addition, they found out that interestingly price shows the weakest potential when trying to achieve a market differentiation.

However, value seems to lie in the:

'… *eye of the beholder.'*

(Tzempelikos, 2020; p. 1).

More specifically, research proposes that customer value can be very subjective as it is based on customers specific perceptions of the concrete costs and benefits included rather than the firm providing the product or service determines as value (Payne et al., 2017; Vargo & Lusch, 2014). These specific perceptions could be influenced by a series of previously conducted transactions over time and all the cost and benefits included within these exchanges (Ritter & Walter, 2012), as well as degree of competition and other external factors (Gale et al., 1994). In this respect, value creation can be seen

as static as well as dynamic hybrid as it can occur in one transaction but as well as a conglomerate of all transactions over time.

The latter can be seen more relational as prior transactions might influence subsequent ones, where cost benefits trade-offs go beyond the traditional service and/or product transactions and include communications flows and personal interactions (Tzempelikos, 2020).

The literature has addressed these holistic views of relationship value by breaking it down in different perspective and themes. However, with all there is known on value in B2B environment there is an agreement in the literature that a deeper understanding of how value develops over time in business relations is needed (Munksgaard & Frandsen, 2019). This seems to be particularly of importance as customers' assessment of value drivers in business can be influenced by the evolution of the environment e.g. emerging technologies in which they engage that can in turn change the way of collaboration and communication (Salo, 2017). Understanding and influencing these perceptions and changes seem vital as they can be served as a basis for more efficient sales and marketing resource allocations shifting from traditional in-person to online marketing, self-service or the integration of social media tools or other digital formats (Ramaseshan et al., 2015; Rollins et al., 2014).

Hofacker et al. (2020) state that evolving environmental factors as the technological advancements in the light of digitalization drive the next era of value creation in business digital marketing and relationship management. According to them this will shape how value is co-created and how customers will perceive this value co-creation (see Figure 18). Research has highlighted the multidimensionality of interactive value formation and that value is not a linear but iterative process based on numerous underlying so called 'value-forming conditions' (Helkkula et al., 2012; Luyen et al., 2022; Spanjol et al., 2015). Types of engagement between stakeholders, the intensity of activities within and across different engagement types in practice are highlighted as such underlying condition dimensions (Luyen et al., 2022). In this respect, value can be seen as a complex process in flux being influenced by multiple elements

as the frequency, number, intensity, as well as types of resources integrated just to name a few (Luyen et al., 2022).

As value is pre-dominantly defined by intangible aspects in comparison to tangible benefits (Vargo & Lusch, 2008; Vargo & Lusch, 2014) this emphasises the potential role of digital technologies in B2B value-creation. As such digital technologies as the internet-of-things (IoT), linking machines to networks, turning passive assets into active communicating and self-organising ones, self-service, and digital supported service hybrids could enhance completely new value co-creation offerings. In addition, they could eliminate cost-intensive human involvement in standardized processes and with-it increasing value by reducing costs (Ramaseshan et al., 2015; Scherer et al., 2015). However, besides many positive aspects it is likely that this creates new challenges that amplifies the softer behavioural aspects of relationships in B2B settings (Hofacker et al., 2020; Sharma, 2021). In this respect, research has pointed out that besides offering new value co-creation possibilities, digitalization can also raise challenges that cannot be addressed with existing business models, demanding totally new combinations of how business is conducted to be truly digital (Ehret & Wirtz, 2017). This might go along with other side effects as the risk of im-personalization of relationships (Ryssel et al., 2004).

With all the different aspect of relationship value outlined, what could be a possible definition? One of the most widely accepted and used definitions of business relationship value in the literature originates from Eggert and Ulaga (2002) that define ‘relationship value’ as:

‘…the trade-off between the multiple benefits and sacrifices of the supplier’s supply, as perceived by the main deciders in the customer organization, taking into consideration the offers from the available alternative suppliers in a specific use situation.’

(Eggert & Ulaga, 2002; p. 110).

In this respect relationship value is defined as a multidimensional, subjective construct conceived as a trade-off between sacrifices and benefits that evolves over time from a consumer decider perspective (Ulaga & Eggert, 2006).

For the purpose of defining relationship value for this thesis the following assumptions are made on the basis of relationship value proposed by Ulaga and Eggert (2002).

First, the claim that value is a multi-dimensional construct on the basis of trade-offs between sacrifices and benefits as stated by Eggert and Ulaga (2002) will be adopted as it represents judgment of benefits and costs that can be found in the main body of value literature. This has been also re-confirmed by recent studies within value literature (Hussain et al., 2020; Tzempelikos, 2020). However, as value perceptions can be subjective (Tzempelikos, 2020), this thesis hypothesises that there is no such thing as a single 'relationship value' but it is at least twofold as it can viewed from a supplier and buyer perspective (see Figure 18).

Second, since the research of Eggert & Ulaga (2002) several studies have stated that that value in a B2B relationship setting can be seen on a wider network and stakeholder basis than just with a seller-buyer dyad. Examples would be external partner relations that are needed in order to fulfil the core exchange activity (Frow & Payne, 2011). In this respect, the aspect of including a wider range of stakeholders that interact within a value creation network will be adopted in relationship definition (Figure 18).

Third, other studies extent the concept of suppliers delivering individual and isolated elements only, with a view on customer value. Examples would be the creation of a unique solution for the customer and that the supplier actively assists his customers in performing their own processes (Prior; 2013; Rabetino et al., 2018). In such cases value creation goes beyond a pure product- or service perspective by taking into consideration integration and other facilitating activities such as processes.

Fourth, as relationships are dynamic, consisting of several episodes, this temporal aspect, with each element offering a different value proposition, will be included in relationship value definition (see section 2.3.2 & Figure 18).

Fifth, as there is a notion in the literature that value consists as of the sum of the underlying benefits and sacrifices of the interacting stakeholders, research suggests that environmental factors as market trends, competition levels up to

global influencing factors, as the recent COVID-19 pandemic, influence market perception (Riviera et al, 2016; Raza-Ullah et al. 2014; Teo et al., 2009 & Figure 18).

Therefore, for this thesis relationship value is defined as:

'…the individual trade-off between multiple benefits and sacrifices of two or more parties engaged within an exchange process as perceived by decision makers in the corresponding party organization over time taking into consideration organizational-, inter-organizational-, relational, technological and environmental factors.'

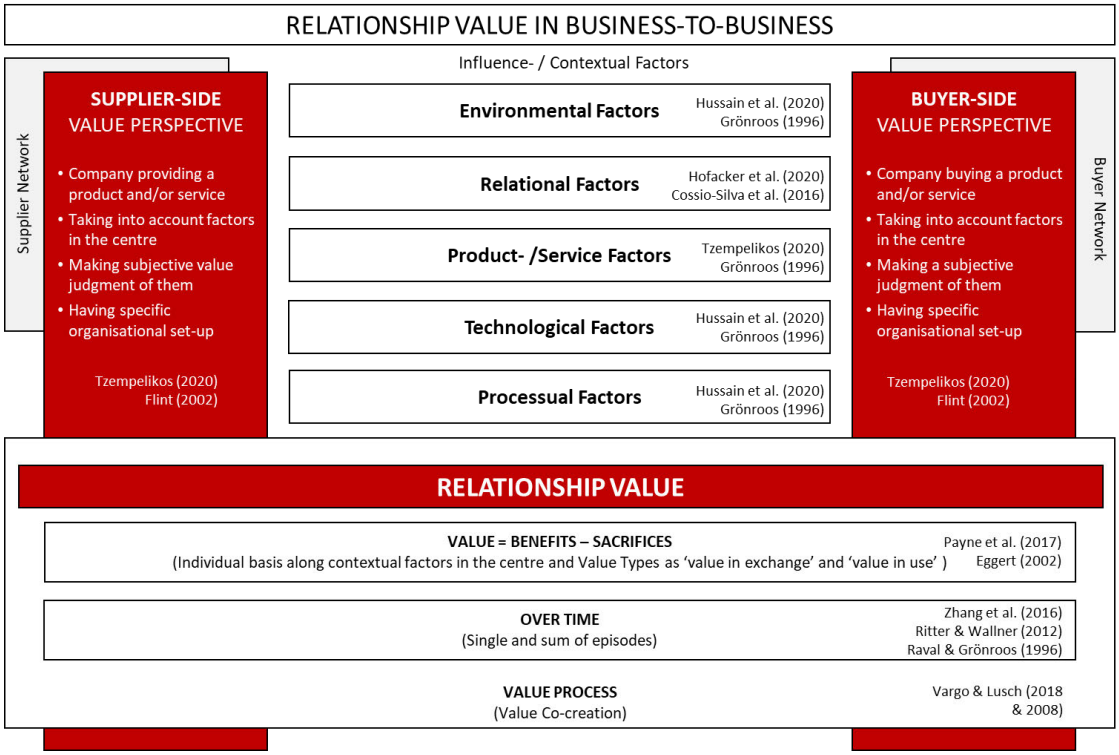


Figure 18: Overview of Relationship Value Elements in Business-to-Business

2.7.3 Business-to-Business and Digitalization Value

It is agreed in the literature that value in a B2B context has changed significantly within recent years due to the advent of digital technologies as cloud computing, interconnectedness of everything and everyone (Pagani & Pardo, 2017; Zaki, 2019). As a result, new potential service- and product propositions are created offering hence wise new possibilities of conducting

business activities all of which having the capacity of changing the very structure of social interactions and value creation processes in business as it is known (Corsaro & Anzivino, 2021).

Today's B2B- but also B2C environments, which are characterized by continuous connectivity, digital interactions and increasing digital capabilities of the masses, have heavily impacted how actors integrate, resource, and engage in value creation activities (Mahlamäki et al., 2020; Steinhoff et al., 2019). Examples are plentiful as transactional business exchanges from buyers-, supplier-, and intermediary relationships that entirely transposed their activities from physical to digital context, in other words using end-to end B2B procurement services online as provided by SAP ARIBA (Allal-Chérif et al., 2021; Bharadwaj & Shipley, 2020; Turkle, 2017). There are reports that state that the majority of today's B2B buyers prefer conducting their business digital and that they prefer to receive information online on their own instead of engaging with sales representatives due to the convenience of digital channels (EMarketer, 2018; Hoar, 2015). Out of the motivation of increasing value, B2B companies have embraced digitalisation to lift efficiencies, reduce costs and with it create higher internal- as well as external customer value (Corsaro & Anzivino, 2021; Thaichon et al., 2018).

Besides the agreement in the literature on the impact of digitalization on value creation, dimensions where and why digitalization can create value exactly have been fuzzier and more scattered leaving currently no comprehensive picture. Taking a technology perspective, Rindfleisch et al. (2017) identified that IoT, big data, artificial intelligence (AI), augmented reality, cloud solutions, as well as social media are amongst the technologies that mainly enable new value creation within the B2B space. Breidbach and Maglio (2016) took an actor- and resource integration perspective by stating that with the advent of such digital technologies the contextual, temporal, and special dimension is changed heavily meaning that exchange of resources can happen at any time, everywhere. Such resources can change, possibly evolve over time, and develop throughout interactions as actors invest, adapt, and learn. In this process potentially new tensions can occur along this digital evolutionary path,

especially in a digital environment where role of actors can get blurry (Ford & Mouzas, 2013; Pagani & Pardo, 2017).

From a value co-creation perspective, Ehret and Wirtz (2017) affirmed that technologies in form of digitalization can impose a certain uncertainty in inter-dependent relationships as new ways of how to engage in exchanges are created as we can see in mobile apps, digital platforms. Bolton et al. (2018) asserted that digital developments affecting the social physical realm stimulate the creation of more customer-oriented approach offering customised customer experience with the help of digital technologies and with-it creating value which would have been impossible without such technologies before. Such customised digital experiences could possibly lead to a digitally enhanced integrated value propositions and therefore improve firm performance (Nath & Bharadwaj, 2020).

Furthermore, the literature in the B2B space also highlights the importance of network aspects that are influenced by use of digital technologies by B2B companies (Corsaro & Anzivino, 2021). The advent of digital developments as digital platforms, where numerous actors from the supplier and buyer side can virtually interact with each other, has influenced the way actors participate in value co-creation processes (Benz et al., 2021; Storbacka et al., 2016). The fact that business activities are undertaken in a digital environment with a different degree of personal interaction, up to no face-to-face interaction at all - which was formerly the dominant mode of exchange - heavily influences the complex construct of buyers, intermediaries, and suppliers including their specific business contexts (Turkle, 2017; Yadav & Pavlou, 2014). However, most studies undertaken in the field of context have remained on a quite general level (Corsaro & Anzivino, 2021).

Another highlight in the B2B value- and digitalization literature is the influence of value co-creation and digitalization. Within the last decades value creation has been at the very centre of marketing research in B2B as it is claimed that customers and supplier work together as a matter of creating superior value that cannot be one-sidedly achieved either by the customer or supplier (Ramasawamy & Ozcan, 2018; Woodruff, 1997). Hofacker et al. (2020) claim

that with the emergence of digitalization and related technologies driving next era of value creation in business, the way value is created and experienced can be fundamentally shaped by digital marketing. The notion in the literature that value is pre-dominantly regarded through intangible instead of tangible assets highlights the potential role digitalization can take (Vargo et al., 2008). However, the role of digitalization in value co-creation is manifold.

One field of digitalization would be the physical infrastructure. Nowadays passive hardware infrastructure elements as machines, tools, and even primary materials could be digitally activated in a sense that with they become an active resource in a value creation process. Formerly passive solar panels could be connected with machine-to-machine telecommunication solutions transmitting their status (Technical parameters, energy efficiency ratios etc.), laying the foundation for new value co-created services as innovative maintenance schemes or business models (Ehret & Wirtz, 2017). Another field of digitalization influencing value co- creation would be the communication level. The increasing use of digital technologies such as collaboration tooling (Microsoft Teams, Zoom, Researchgate.com) could be of help to transcend challenges related to intra-organization and inter-organizational time and space discontinuities - not to speak of modern relationship management systems as provided by salesforce.com and other companies following a software platform business-model (Obal & Lancioni, 2013). Other examples can be found in the e-commerce space, where platforms like Amazon, Alibaba but also ebay, three major internet-based marketplace platforms, expanded their scope from pure digital marketplaces providers to product and service integration platforms (Hofacker et al., 2020). With this approach service- and product offerings all around the clock, over multiple geographical sites are made possible by the provisioning of digital data and processes. In addition, such developments can give insights to the underlying buying behaviour behind as well as enabling customer comments that could provide a useful basis for future product and service adaptations.

In this respect, one of the very core essences of value co-creation is the engagement with customers and suppliers during each stage of the relationship and product or service production stage (Payne et al., 2008). In this respect,

digital technologies seem to be much more than facilitating the communication between supplier, producer and the customer but also shape how this is entirely executed (see Figure 19).

The use of blockchain technology, a cryptography technique, can be of use to execute, track, and secure value activity packages and therefore reducing the need for manual monitoring within B2B partner networks (Queiroz et al., 2019). In this respect, it can be claimed that with the help of digital technologies new value spheres as digital product- or service benefits are realised by integrating suppliers and buyer's capability within an interaction activity which were not possible without such technologies (Kohtamäki & Rajala, 2016). On the contrary, besides the mentioned benefits digitalization can bring in the field of value creation, research has also identified the downsides as certain risks. Examples would be that not all business models can similarly benefit from digitalization up to that traditional business might go out of business as they cannot hold pace with the digital competition (Ehret & Wirtz, 2017).

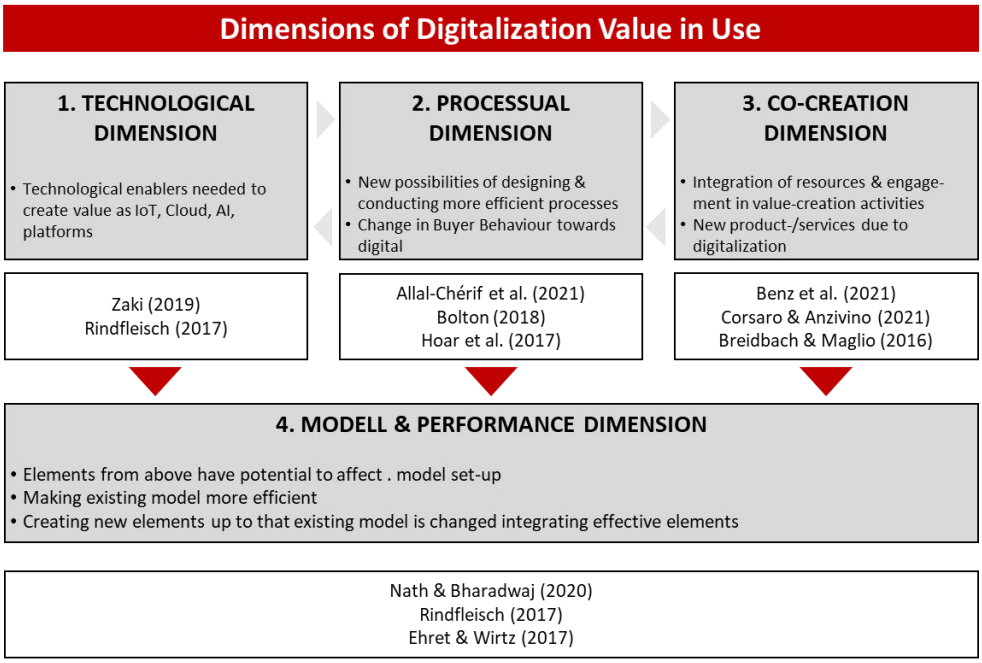


Figure 19: Dimensions of Digitalization Value in Business-to-Business

2.7.4 Value and Values in Business-to-Business Digitalization

The literature review on value revealed that value as a concept and value co-creation as a process is a highly complex construct along multiple dimensions (see Figure 17 & Figure 19) in which different actors operate and are mutually affected by contextual conditions and relational aspects as the use of digital technologies which are rapidly and continuously modified (Corsaro & Anzivino, 2021; Grönroos, 2011; Vargo & Lusch, 2008).

However, besides the complexity of value, value is agreed to be one of the main driving forces, why actors engage within exchange activities as it is the ultimate objective in business to maximise value by optimizing benefits and sacrifices.

An important step in growing the understanding of customer value in B2B markets was to reveal that organizations not only create value by exchanging services or products in singular transactions. Rather, business relationships are accepted to have a potential for value co-creation between relationship actors in their very own respect by engaging in co-creation process by bringing in different capabilities and intensity levels. Therefore, the former transactional perspective of value has been enriched by more relational elements which can be named ‘relationship value’ or ‘relational value’ that includes assessment of objective achievements as a summative evaluation of past transactions and anticipated future developments (Minerbo & Brito, 2021).

However, relations consist of actors and actors can differ, consequently if an actor brings in its capability or not, depends on its individual perceived value as indicated by Woodruff (1997), which is based on the ‘expected value in use’ and/or ‘experienced value in use’ consideration. Still, it is not just the idiosyncrasies of the different individual actors that can influence value creation.

A further perspective of value creation in B2B is the recognition that business activities happen in markets or ecosystems of several actors and stakeholders (Sila, 2015). Such ecosystems are influenced by numerous elements that go beyond relational view of suppliers and buyers and could include also

environmental, processual, and technological factors as digitalization (see Figure 19).

Such elements can be seen as a value context sphere that is defined as:

'… the combination of specific circumstances that allow for a phenomenon to be fully understood; thus without this understanding, value creation can be only partially explained.'

(Corsaro & Anzivino, 2021; p. 340).

However, even if value creation can be claimed to be context specific, within this literature review it became obvious that digital technologies in form of digitalization play a more universal role. Even if their specific value-add or -loss might be context-bound, the possible imaginable contexts in which digitalization appears seem endless and it is hard to imagine that there is any B2B space that seems not affected by it.

Still, as outlined before, the formats in which digitalization creates values are plentiful ranging from making existing processes more efficient with the help of technology as well as creating entire new digital enhanced or purely digital products and/or services. Nevertheless, it became clear that digital technologies alone create no value and should be more seen as a value enabler or potential value bucket. If value is to be enhanced or created depends on if there is a beneficiary that subjectively 'values' the direct or indirect outcomes of digitalization (Vargo & Lusch, 2018). Such beneficiaries could be external customer benefiting for an improved delivery process or internal employees being able to handle service use cases in much lesser time due to efficiency gains. And in some constructs, as value co-creation, it can be argued that there is not only the condition that the beneficiary alone potentially values certain things, he or she as well as other actors must be capable and willing to bring in certain capabilities to realise this value co-creation at a cost or sacrifice. In this respect, even if the mainstream of publications around digitalization is technology centred, we cannot expect that technological aspects alone would be the universal solution.

Based on the value theory outlined, without human engagement value creation would not be realised for the main cases of imaginable examples.

Consequently, it appears reasonable to consider human aspects in non-digital and digital value creation activities.

However, it has to be acknowledged that in a world where billions of machines are digitally connected, and millions of autonomous algorithms managing processes without any human intervention, it could be evaluated outside this research project if ‘machines’ could be possible value beneficiaries as well.

2.8 Summary of Findings and Gaps

From section 2.3 on B2B relationships it can be summarized that it is agreed in the literature that relationships in B2B are highly complex with one complexity driver being that relationships can be dynamic meaning that they can develop in different directions, over time, throughout different stages (see Table 3 & Figure 9). In addition, relationships can be based on transactional activities or relational ones, based on a sum of elements as the complexity of products and services, forming different relationship types (see Figure 8). Such relationship types are highly individual having different potential development paths, each having unique characteristics that need to be addressed differently when it comes to relationship management (Zhang et al., 2016). Reasons for that are manifold with the main argument found in the literature that certain exchange activities as services are more effective than others, depending on the underlying relationship state (Luo & Kumar, 2013; Netzer et al., 2008). However, even with the acceptance of relationship stages and -types in the literature affecting effectiveness of marketing and other activities, no service digitalization framework or technology adoption model was identified taking this dynamism and difference in types of relationships into account (see Section 2.3.2). This seems important to address out of several reasons. On the one hand, service capabilities have to be aligned to fulfil the service purpose of the service provider as well as to meet the service expectations of the service consumer; especially the latter can be different depending on the underlying relationship stage or -type (Oliveira & Roth, 2012). As relationship stages and -types are different in characteristics, different combinations of service design elements with the underlying service capabilities have to be provided – if not

they risk not to achieve the expected service outcome with less value generated up to service failures negatively impacting the entire relation (Forbes, 2020; Hübner et al., 2018; Liu et al., 2020).

Besides addressing the relationship state and -type, there is indication that the dynamism of relationship migration paths between different states also need to be addressed. It can be that a service set up might be relationship state effective but that must not be the case for migrating to the next state-level which should be the objective as higher value returns are to be expected (Eggert et al., 2006; Zhang et al., 2016).

Brown et al. (2009) state that:

'For all of that promise, though, making services work isn't easy, and success is far from assured. Many companies are unprepared when they make the move into new territory, and fall into a number of traps, such as introducing services the wrong way and focusing on the wrong points when pitching them to customers.'

(Brown et al., 2009; p. 7).

In addition to the complex field of service capability effectiveness, a technology perspective has to be integrated as digital infused services and/or digital servitization cannot be realised without it (see Section 2.6.2). This is even more important as there is an indication in the literature that technology is taking a new as well as different role as before (Pagani & Pardo, 2017; Rafaeli et al., 2017). What was outlined as an enabling element in the past, supporting certain elements of already existing product- and service creation processes and their delivery, can now create totally new service portfolios, up to even creating new bonds amongst actors not previously linked with the help of technology (see Section 2.6.3; Pagani & Pardo, 2017; Rafaeli et al., 2017). That could mean that the service digitalization capability provided must take into consideration that there is not a bilateral relation to be addressed, having one relationship state and one migration path to the next level, or one service producer and service consumer only, but multi-lateral relations amongst known actors up to network-lateral connections with new actors. In addition, any technological development

in form of digitalization needs to consider relationship state flexibility as a form of state adequate capability addressing the different state relevant elements. However, even with the notion that this is a relevant factor, ‘how’ relationship stages influence service capability effectiveness is not yet fully clear. This is further supported by authors calling for research considering dynamic aspects of relationships. Arli et al. (2018) state that:

‘Noting demands for a more dynamic view of relational selling, the impacts that digital relationships exert across different phases of a buyer–seller relationship also are pertinent, reflecting the need to evaluate the effectiveness of online platforms as the relationships progress over time.’

(Arli et al., 2018; p. 181).

From the service section (see Section 2.5) it can be concluded that services differ in characteristics as service complexity, asking for an adapted set of capabilities to achieve the intended service outcome (Oliveira & Roth, 2012). It became evident that services are seen as growth area in the B2B domain, and that technology is offering new possibilities in the form of digitization, digitalization, and (digital-) servitization (Raddats & Easingwood, 2010; Weigel & Hadwich, 2018). However, what is missing is the link between service types, relationship management, and the potential influence of digitalization (see Section 2.5 & 2.5.2). In addition, there is only scattered knowledge on what capabilities are needed to realise exactly what kind of digital services and/or digital-servitization, and how to combine them to implement digitalization programmes successfully (Annarelli et al., 2021; Wirtz & Kowalkowski, 2022).

‘This dispersion of papers indicates that literature on this topic [service digitalization capabilities] is still into a developing phase, with authors studying the topic from different points of view and with different theoretical heritages. This proves that a unified corpus of academic production in the field of digitalization capabilities still has to be developed.’

(Annarelli et al., 2021; p. 12).

Therefore, this research project aims to construct a relationship value service digitalization framework to investigate options of service digitalization measures across influencing factors and underlying necessary capabilities in the B2B domain. More specifically this research project addresses the following research question (RQ).

RQ1: What is the potential of service digitalization in B2B relationship value management?

From a theoretical point of view an extent amount of literature has researched technology in the form of digital transformation and its influence on service management on a general level (Giebelhausen et al., 2014; Pemer, 2020; Solnet et al., 2018). This has led authors to describe the whole service management industry to be:

'…at an inflection point.'

(Wirtz et al., 2018; p. 908).

, predicting that many service industries will be subject to tremendous fundamental changes to react to the threat of a possible disruption (Ostrom et al., 2015; Van Doorn et al., 2017). However, after the literature review undertaken the author agrees with Pemer (2020) and Nguyen et al. (2020) that up to today the main body of investigation efforts has researched standardized B2C services like cashier desks or travel agents' environments and the perception on the B2C consumer side, and for the main part leaving out the field of B2B environments (Gnädinger, 2011; Scherer et al., 2015; Wirtz et al., 2018).

Even with a tendency in the literature that technology is already available to digitally augment complex B2B structures in certain circumstances (Susskind & Susskind, 2015; Wirtz, 2018) this field remains:

'… an unchartered area of frontline research, where theory and research lag the technological advances that continue to be deployed in practice.'

(Singh et al., 2017; p. 8).

Recently, there seems to be some knowledge emerging in the field of B2B service digitalization, however only fragmented and to a large extent on a high-

level basis only, rarely making references to its use or impact on relationship management. Examples include Reis et al. (2019) that acknowledge the importance of digitalization in B2B service management, pointing out that there are still limited capabilities in the narrow context of customer recovery of B2B banking, which can be seen as one relationship phase (Zhang et al., 2016). Pemer (2020) claims on a high-level basis that the impact of digital transformation depends on the service itself, in other words that each service proposition needs a certain ‘service intelligence’, where a unique fit of technology is critical for success.

This is in line with findings of service capability requirements of Oliveira and Roth (2012). However, Pemer (2020) makes no direct reference ‘how’ this would impact the relation itself besides mentioning that in certain professional B2B services, as auditing services, the introduction of digitalization measures is influencing customer loyalty as customers expect that their suppliers are up to date with technology.

Bolton (2020) asks for a stronger integration of different so called ‘realms’ (physical-, social-, and digital-realm) in B2B digitalisation settings. In more detail, Bolton (2020) ask for inheriting certain social aspects of relations (personal interaction) to fulfil the increasing need for customized B2B customer service experiences. This argumentation of integration of different realms is close to research of the IMP GROUP (see Section 2.3; Håkansson, 1982). However, Bolton (2020) leaves out how this could affect relationships exactly and how they could be managed with regard to value enhancement.

Pagani and Pardo (2017) offer one of the few examples of B2B relationship research that proposes a framework which inherits different elements as in what form digitalization can impact B2B relations (activity-, resource- and actor bond centredness); however, leaving out how this is changing the value proposition. In addition, there is no answer to what different ‘realms’ need to be addressed exactly, as proposed by Bolton (2020), or what different service intelligences in form of capabilities are needed to realise them as proposed by Pemer (2020).

Huang and Rust (2018) point out the potential of digital transformation and form of artificial intelligence and that their value contribution can be achieved on

different levels (mechanical, analytical, intuitive, empathetic), which is close to argumentation of Pemer (2020) service intelligence adequateness. However, no reference to relationship itself is made having a strong focus on the digitalization technology in general. Nguyen et al. (2020) cautions to use digital technology in certain B2B service settings as service value could be jeopardized if digital technology and intended service quality outcomes are not balanced. From a practitioner's point of view there is no doubt that the insights outlined on digitalization and services in general and within B2B service settings above can be of help. However, with the restriction that they are often on a very high-level basis making detailed assumptions difficult as 'what to do exactly, in what situation?' in order to manage customer relationship value in B2B service settings.

In addition, it appears unlikely that practitioners undertake a research as time consuming as this literature review, answering the RQ1 by putting together all the scattered knowledge existing on their own. Therefore it seems fruitful to provide a more holistic framework in the specific domain of B2B service relationship value management, by showing what are concrete digitalization potentials in B2B service settings in order to manage relationship value, and what are possible influencing factors and potential challenges.

As up to today trillions of dollars are invested in digitalization efforts (BusinessWire, 2018), and a still inadequate understanding of how the value of such activities are perceived (Nguyen et al., 2020), exploring this topic seems even more relevant. In doing so it could add to the contribution to practice pool in digital transformation, answering 'what digitalization really means for company relationship value chain?', as well as possible clarifying myths like:

'digital requires radical disruption of value proposition…'

with other managerial understanding that:

'… It usually means using digital tools to better serve the customer needs.'

(Furr & Shipilov, 2019; p. 96).

In this respect, this research project could provide professionals, responsible for B2B service relationship management, with insights on what opportunities as well as possible stumbling blocks exist in the combination of human and technology-based capabilities in such service digitalization domains (Brynjolfsson & McAfee, 2015). This could enable managers thinking of implementing digital elements within their service management proposition, or updating them, to better judge what is possible, what factors to look out for when doing digital transformation of their service management environments. As it can be claimed that the ultimate objective of all business activities is to create value the following additional research question is proposed for this research project.

RQ2: What factors influence the value in practice perception of service digitalization in B2B relationship management?

It is accepted in the literature that firms, either on the producer or supplier side, try to maximise value (Mencarelli & Riviere, 2015; Ravald & Grönroos, 1996). For decades companies have been using IT to enhance quality and to achieve cost reduction efforts in business processes (Ekman et al., 2020; Salo, 2006 & 2008). However, prior research has found out that there is a limit to which IT can effectively automate processes given that not all human interaction can be replaced by technology (Giebelhausen et al., 2014; Limbu et al., 2014). An issue that was already outlined back in 2004 in the aftermath of the *dot.com economy* with Ryssel et al. (2004) stating that:

'IT carries the danger of impersonalizing relationships, which, in turn, could lead to reduced trust, commitment and value creation.'

(Ryssel et al., 2004; p. 204).

This issue remains today, where firms often struggle to solve the tension between the ability to react to the preferences and needs of business partners while simultaneously wanting to lift cost efficiencies by using potentials of digital transformation (Bhappu & Schultze, 2006; Ekman et al., 2020). What might be a value increase measure for one firm such as a supplier firm digitalising a

service process previously delivered by a human and therefore saving costs, might cause tensions in another company having the opposite effect.
This might lead up to value deterioration on the consumer side of this newly digitalised service if not cautiously managed as there is an agreement in the literature that not all customers value technology in the form of digitalization in the same way (Bitner, 2001; Ekman et al., 2020).

Even with technology and digitalization being around for some time as an accepted enabling element of customer engagement (Giebelhausen, 2014), the understanding of the perceived value of digital technology is limited (Lamberton & Stephen, 2016). This seems especially relevant in the service segment, where Giebelhausen et al. (2014) point out the insufficient clarity to which extend technology serves as a benefit or barrier. A topic that seems even more relevant as it is addressed within numerous studies (Coutelle-Brillet et al., 2014; Hein et al., 2019).

The few studies existing within the B2B domain primarily focus on e-commerce (Sila, 2015; Vize et al., 2013), supply chain (Kim et al., 2013; Obal & Lancioni, 2013), and areas of manufacturing (Osmonbekov & Gruen, 2013; Peterman, 1997), and are mainly centred around physical goods in physical environments (Ryu & Han, 2010; Yuen & Chan, 2010), or pure application of digital technology in form of self-service technology (Ramaseshan et al., 2015). In particular, research examining the effect of digital transformation on relationship management are sparse in the domain of B2B (Kingshott et al., 2020; Pagani & Pardo, 2017). In addition, recent research highlights that most of existing studies in this field missing an integrated provider and user perspective.

‘ …most of the studies on digital platforms in B2B focus either on service provider or client side, there are very few studies that explore the dyadic relationship.’

(Shree et al., 2021; p. 362).

From a contribution to practice perspective, managers responsible for B2B relationship management could be provided with insights of what is the value contribution of certain type of digital activity in a specific service domain.

Besides pointing out possibilities of cost benefits (Salo, 2006; Scherer et al., 2015) from an ‘provider’ internal perspective - in other words the company implementing a digital service with the intention to lift cost potentials perspective - the value add of this research would be to provide the ‘consumer’ external perspective as well. In detail, this would consider how the new digitalised service is perceived by the consumer in a certain context. In this sense, the objective of this research project is to provide concrete practical insights in form of examples of customer perceived value as a certain ratio between benefit expectations and associated costs within B2B service relationship management context (Gao et al., 2012; Kumar et al., 2013; Rust et al., 2004).

In order to increase transparency to the reader, a third research question is added as a result of findings gained in the expert interview section (see Chapter 5, p. 170). How this third research question is addressed is included in the following chapter, as well as the two research questions above.

3 RESEARCH DESIGN AND METHODOLOGY

The purpose of this chapter is to outline how the research questions of this research project are addressed.

> **RQ1:** What is the potential of service digitalization in B2B relationship value management?
>
> **RQ2:** What factors influence the value in practice perception of service digitalization in B2B relationship management?
>
> **RQ3:** How do B2B companies manage service digitalization projects in practice, and what are the potential challenges and learnings?

By the end of this chapter, the reader has a clear picture of the objectives derived from the research questions, the intended sources of information and data, and how this data is proposed to be collected, analysed, and discussed. References to possible constraints as well a special focus on aspects of validity and reliability.

3.1 Elements of the Research Design and Application to the DBA Topic

The ‘research onion’ devised by Saunders et al. (2016) is introduced and applied to this DBA project as the structure for the research design (see Figure 20). The underlying assumption of the research onion approach is that the choices of data collection, data analysis methods, and interpretation of results are heavily influenced by several elements (or layers) that must be pre-defined. Additionally, these choices must be followed rigorously to achieve a coherent end-to-end research approach. This approach is a first step towards validity and reliability, because it gives the reader and the future managerial and scientific audience a transparent account of which element was chosen, why, and the possible outcomes, benefits, and limitations (Creswell & Creswell, 2018; Saunders et al., 2016).

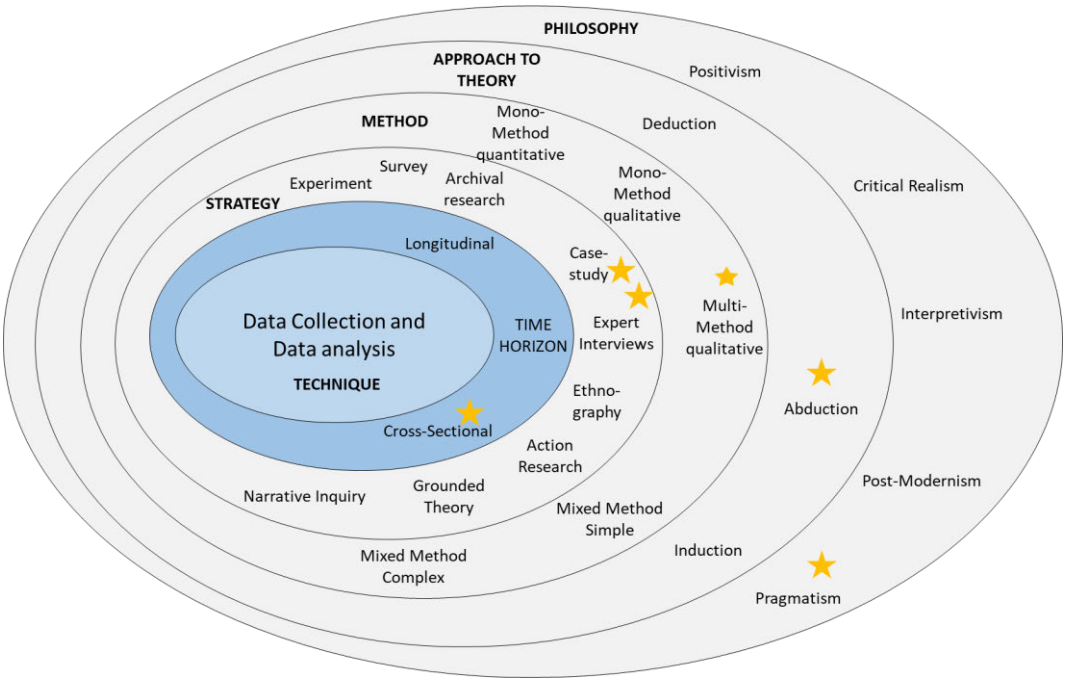


Figure 20: Adapted From the 'Research Onion' by Saunders et al. (2015)

3.2 Research Philosophy

The first layer of the research onion is a system of beliefs and assumptions of how knowledge is acquired and developed. This contains epistemological assumptions and how realities are encountered as well as ontological assumptions (McAuley et al., 2014; Saunders et al., 2016). It is widely accepted in the literature that assumptions (conscious or otherwise) will arise throughout the research process. These assumptions inevitably influence the research process and methods and how findings are interpreted. That is why studies on research methodology suggest that researchers must be aware of these philosophical stances and their commitments (Johnson & Clark, 2006).

As a novice researcher, I arrived at the following philosophical stance. I have taken into consideration ontological definitions from Fleetwood (2005) and have determined from a high-level perspective that I am part of this world, have my own interpretation of it, I am shaping reality, and I am shaped by it. In addition, I am aware that this world is a reality that exists internally but will also continue to exist when I am departed.

From an ontological stance, I put myself in between a subjective and objectivist ontology; I would call myself an ontological hybrid who is aware of the two

dimensions and is attempting to combine them. Natural scientific approaches and social sciences make sense and can be of use, similar to the German tradition of acknowledging that there are *Naturwissenschaften* [natural sciences] and *Geisteswissenschaften* [social sciences, sciences of arts] (Mainusch, 2013).

I have chosen pragmatism as my ontological and epistemological stance (Bridge, 2014; Whitford & Zirpoli, 2014).

The history of pragmatism traces back to an American school of thought that emerged in late 19th century around one central figure, Charles Sanders Peirce (Van de Ven, 2007). In his article, 'How to Make Our Ideas Clear', Peirce (1878) introduced the term pragmatism; the term was derived from Emmanuel Kant, a German philosopher of the 18th century, and can be traced back to an ancient Greek word introduced by Aristotle, *apagoge* (Bertilsson, 2004). Pragmatism intended to reconcile empiricism and rationalism by revealing that doing and knowing are fundamentally indivisible parts of the same process (Bertilsson, 2004).

The pragmatist approach strives to reconcile subjectivism and objectivism, values and facts, knowledge, as well as contextualised experiences (Saunders et al., 2016). With respect to knowledge generation, the pragmatist conception of truth can be seen as unique, as it assesses numerous merits of beliefs towards the actions they enable and the associated consequences they bring (Sergeeva et al., 2021 & 2022). This school of thought proposes that, in a complex environment characterized by unknowability and emergence, beliefs can be fallible and must be revised in light of new experiences and changing circumstances (Bromley, 2006; James, 2017).

As the author is working in a highly complex environment such as B2B digitalization, focussing on transforming established business models with the help of technology, this school of thought seems to have a reasonable fit.

3.3 Approaches to Theory Development

There are two main dimensions to the second research onion layer, theory development, that can be found in the literature: deduction and induction (see Table 4).

Ketokivi and Mantere (2010) have suggested a deductive approach that derives the conclusion from a set of premises; when the premises are true, the conclusion is true.

Within a deductive approach, research would begin with a theory that has been found or developed within the literature review, and the design of the research strategy is to test this theory. In contrast, following the argumentation of Ketokivi and Manterre (2019), induction implies a gap in the logical argument between the conclusion and the principle analysed, and the conclusion is judged to be reinforced by the number of observations made. Within an inductive research the first step is collecting data on an exploratory basis, and a theory is generated on that basis (Saunders et al., 2016).

A possible third approach that has been suggested by the literature is the abductive approach (see Table 4). This involves collecting data to explore a phenomenon, identifying themes, and explaining patterns to generate a new theory or to modify an existing theory (Sergeeva et al., 2021; Ritz, 2020; Saunders, 2016). This theory is tested on the basis of additional data collection.

Table 4: Overview Research Approaches From Saunders (2016)

	Deduction	Induction	Abduction
Logic	In a deductive inference when the premises are true, the conclusion must be true.	In an inductive inference, known premises are used to generate an untested conclusion.	In an abductive inference, known premises are used to generate testable conclusions.
Generalizability	Generalizing from the general to the specific	Generalizing from the specific to the general	Generalizing from the interactions between the specific and the general
Use of Data	Data collection is used to evaluate propositions or hypotheses related to an existing theory.	Data collection is used to explore a phenomenon, identify themes and patterns, and create a conceptual framework.	Data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework, and test the framework through subsequent data collection.
Theory	Theory falsification or verification	Theory generation and building	Theory generation
Narrative:	*Show something / prove something.*	*Observe and make a conclusion.*	*Discovering something that may be true.*
Example: *Premise 1* *Premise 2* *Conclusion*	 All men are mortal. Socrates is a man. Socrates is mortal.	 Swan one is white. Swan two is white. All swans are white.	 All beans in the bag are white. This bean is white. This bean comes from the bag.
Sources	Gill and Johnson (2010) Saunders (2016) Van de Ven (2007)	Gill and Johnson (2010) Saunders (2016) Van de Ven (2007)	Ritz (2020) Saunders (2016) Sergeeva et al. (2021)

Abduction linked to pragmatism is chosen for the following reasons.

First, there is existing theory, in other words, existing technology adoption- and relationship management models (see Sections 2.3.2 & 2.4.2). However, as these models are, for the most part, focussed on B2C activities and of a general nature, they must be explored if they are to be scientifically sound in a B2B and service digitalization context.

Second, various relationship development models have been already proposed in a B2B context (see Section 2.3.2). However, all fail to explain the role of service digitalization in B2B in general and, more specifically, in the service domain and their impact on relationship value enhancement. As an example Sila (2015) points out technology as a possible influencing factor of e-service adoption in B2B activities but fails to specify whether it is hardware, software, or the combination or something else.

Third, it is the belief of this author that exploration is necessary if new influencing factors arise when combining relationship theory with aspects of

digitalization in the service domain. Additionally, a focus must be placed on certain influencing factors and whether current adoption models must be complemented or specified. In general, the question whether existing B2B relationship management theory and underlying influencing factors are still valid must be answered in light of the potential for service digitalization today and in the future.

The question arises, how can the selected themes from above be explored from a pragmatist perspective. Within his pragmatist thinking, Peirce introduced abduction as a creative mode of discovering that follows neither deductive nor inductive modes of inference, the latter being widely believed to be the fundamental process of scientific engagement (Van de Ven, 2007). Peirce strongly denied this, arguing that inductive methods serve not to initiate but rather to test theory (Hookway, 2002; Mounce, 1997). In this sense, as the smooth interlinkage of both induction and deduction hangs on the substance, which is nourished by abduction, abduction can be seen as the key inference (Bertilsson, 2004). Abduction informs the audience about why something is the exactly the way it is and, therefore, is an act of insight. However, this insight can still be fallible. Within the works of Peirce there is one noticeable example of abduction about beans that exemplifies this potential fallibility:

'Major premise: The beans in the bag are white.

Minor premise: The beans are white.

Result: The beans come from this bag.'

(Charles Sanders Peirce, 1878; in Bertilsson, 2004; p. 376).

Even when appearing simple, this example nevertheless has wide logical consequences in comparing it to deduction or induction (see Table 4). There is not the same logical firmness as within deduction, where the final result must be true if the minor and major premises are true (Bertilsson, 2004). The fact that the white beans come from this very bag may not be true after all, as someone could have placed them there from somewhere else. In this sense, abductive reasoning can provide a clue about reality; however, it always includes a 'maybe' conclusion (Bertilsson, 2004).

However, in the thinking of Pierce, in line with Aristotle, this incertitude is the basis of all knowledge. Whereas deduction and induction are utilized to predict any future outcomes, based on findings from the present, abduction can be seen to explain outcomes and, therefore, provide a conceivable guide for actions to realize a desired outcome (Bromley, 2010).

For this research, this would mean to propose a pursuit-worthy framework and actions to take to enhance relationship value in service digitalization settings based on expert knowledge (see Chapter 4), and real-life cases (see Chapter 5).

Studies that advocate entrepreneurial decision-making adopt core pragmatist tenets by emphasizing the importance of problem-solving and experiential learning, making pragmatism a problem-solving philosophy that is particularly well suited for addressing the question of how to organize in the face of complexity such as service digitalization and relationship management (Farjoun et al., 2015; Sergeeva et al., 2021 & 2022).

From a pragmatist perspective, complexity is not limited to multiple factors as single variables in a model to be tested, or their interactions, and probabilistic decision logic (Clarysee et al., 2011; Townsend et al., 2018; Packard & Clark, 2020). Rather, complexity connotes the potential unknowability of the future deeply rooted in the notion of emergence of knowledge, meaning that circumstances change within knowledge (Ramoglou, 2021). Pragmatists admit to the fallibility of all knowledge generated (Dewey, 2021).

From a pragmatist perspective, knowledge and, with it, truths constantly emerge, and in the words of Charles Sanders Peirce (1878), if truth potentially exists it is not more than:

'… the opinion which is fated to be ultimately agreed by all who investigate.'

(Charles Sanders Peirce, 1878; in Sergeeva et al., 2021; p. 5).

3.4 Methodological Choice

The third layer of the research onion is concerned with the methodological choice of research, which is derived from the choices in the previous layers in terms of coherence. There are two main methodological styles to differentiate – quantitative and qualitative. One method is to distinguish between non-numeric data (words, images, videos, or similar formats) and numeric data (numbers). In the literature, quantitative approaches are often linked to numeric data collection procedures through questionnaires, for example. By contrast, qualitative approaches are linked to procedures that use non-numeric data such as interviews (Saunders et al., 2016).

A sequential exploratory approach is proposed (see Figure 21). This approach starts with the qualitative theory building block (exploring potential influencing factors of service digitalization in B2B relationships) from the literature review. This is followed by semi-structured expert interviews to validate and possibly complement the literature review as well as to construct a B2B relationship service digitalization framework that proposes relations among constructs currently missing in B2B service digitalization (see Figure 21 & Pemer, 2020).

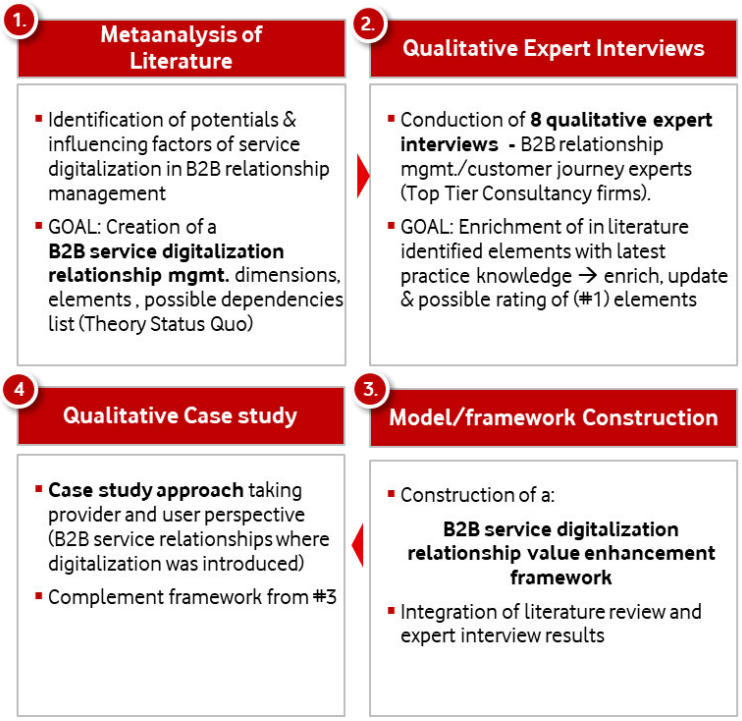
For this research project, which aims to shed light on the field of B2B service digitalization and relationship value enhancement, the choice of a qualitative approach seems fruitful, for the following reasons.

First, many studies researching B2B technology adoption have focussed on quantification only (Derrouiche et al., 2010; Ramaseshan et al., 2015; Sila, 2015), with the possible downside that the richness of each underlying situation is hidden inside a number that bears the risk of not fully capturing the complexity and the nuances of digitalization.

Second, choosing a qualitative case-study approach would enrich existing B2B studies that employ more quantified approaches (Ramaseshan et al., 2015; Sila, 2015) by adding qualitative insights. However, in addition to case-study research having the potential to generate detailed insights incorporating various aspects, the downside is that it is often bound to a very specific case and its underlying environment – in other words, one or a small number of companies –

thereby threatening the generalizability of results (Creswell & Creswell, 2018; Saunders et al., 2016).

Figure 21: Overview of the DBA Research Approach



3.4.1 Methodological Choice of Qualitative Expert Interviews

To validate and possibly complement insights in B2B service digitalization that were gained in the literature review in Chapter 2, gathering latest first-hand information from knowledgeable experts in these fields was regarded as a fruitful avenue to pursue.

On the one hand, as digitalization is a fast-moving topic with numerous articles getting published on a weekly basis it seemed important to complement this with latest up to date in practice knowledge. This seems even more relevant as even recently published articles in academic journals contain information that can easily be several years old as acceptance-, revision-, and publication cycles of academic journals, and the priorly conducted research, are activity intensive and timely endeavours (Guest, 2007; Hubbard, 2015). In addition, there seems a risk that a certain body of knowledge gained in practice and academia does

not find its way in academic journals out of reasons as limited capacity of publishers - in other words journal space, entry barriers, and commercial interests (Peters et al., 2016). As a result, a lot of research activities are not published leading to certain frustration on authors side and an arguable situation that not all knowledge from practice and academia is shared with a possibly interested audience (Peters et al., 2016).

The literature points out a whole set of potential alternative qualitative data collection methods such as doing focus groups, using narrative data, or doing different types of specialised interviews (Bogner et al., 2009; Creswell & Creswell, 2018; Flick, 2018; Saunders et al., 2016).

Focus groups have been pointed out in the literature as one way to extend the single interview situation to a group of people, typically accounting for six to eight interviewees (Patton, 2014). Within a focus group format the interviewer's main task is to prevent partial groups or single participants from dominating the discussion. In addition, the interviewer should motivate potentially reserved participants to become involved in the interview (Flick, 2018). In general, focus groups are seen as a highly efficient data collection technique as shared views on a specific topic are quickly assessed on the one hand. On the other hand, participants tend to provide checks and balances on the opinions made within the group discussion that potentially weeds out extreme or false views (Flick, 2018; Patton, 2014).

There are also some weaknesses of focus groups found in the literature such as the limited number of questions that can be asked and problem of taking notes in parallel to moderating such a format (Patton, 2014). In addition, it has been highlighted in the literature that resources, time, and geography can pose potential barriers to focus group formats as participants have to be available at the same time (Ross et al., 2006). Such factors can affect as well individual interview settings; however, there is an agreement that these are generally simpler to arrange involving two participants only consequently having a higher degree for flexibility with regard to time and venue (Flick, 2018; Kitzinger & Barbour, 1999).

An alternative qualitative data collection technique highlighted in the literature is the narrative interview that can be defined as a specific method for collecting narrative data by employing a biographical approach (Flick, 2018; Rosenthal, 2006). Narrative interviews can be used in biographical research or by asking participants to recount and remember their experiences on a specific topic and its wider context (Rosenthal, 2006). Within a narrative interview the interviewer's task is to make the participant tell the story of a specific area of engagement from the beginning to its end (Flick, 2018).

Even with several advantages of narrative interviews highlighted in the literature such as comprehensive accounts of processes and that they might overcome the impulse to concealing embarrassing parts of the topic there are several limitations highlighted (Anderson & Kirkpatrick, 2016; Flick, 2018). The literature is pointing out several practical problems as the sheer amount of data generated that has to be transcripted. In addition, narrative interviews are claimed to be less obviously structured than semi-structured interviews (Saunders, 2016). Taking a theoretical perspective the narrative interview builds on the assumption that the researcher gains access to events and experiences that are told really happened as they were told. However, the researcher has to be conscious that this assumption might not be valid at all as the narrated content might be constructed during the interview situation and include memories or events that happened after the period of interest (Flick, 2018).

Besides the different qualitative methods highlighted above the literature offers some other types of semi-structured interview formats, which were developed for specific fields e.g. expert and elite interviews (Flick, 2018; Saunders, 2016). In contrast to biographical interviews, where the interviewee as a whole person is the main research interest, expert interviews focus on the interviewees in their capacity as an expert in a certain field i.e. digitalization (Meuser & Nagel, 2009). Typically experts are not integrated as a single case but as representing a group e.g. consultants.

The literature points out that experts have interpretive and technical process-oriented knowledge in a specific topic of interest (Bogner & Merz, 2009).

For this thesis individual semi-structured expert interviews were chosen out of the following reasons.

First, from an organizational point of view it was more practical to conduct individual interviews as this gave more flexibility to the availability of the respective expert. The experts interviewed were allocated in different time zones having tightly managed calendars. Many of the interview slots arranged moved several times in due course to accommodate changes on the expert side due to flight changes, overrun of client appointments and sickness. Proposing a focus group format alone would have also born an additional risk of potentially losing identified experts due lack of availability and possible compliance issues as the experts interviewed were from competing organizations (see Section 3.4.2).

Second, during the interview period there were some further constraints to in-person meetings due to the ongoing COVID-19 pandemic. An alternative would have been a virtual focus group set-up using video conferencing tooling; however, such set-ups are regarded as highly complex from an organizational point of view. In addition, there are some other constraints highlighted in the literature as the limitation to establish social presence in comparison to face-to-face set-ups leading to less engagement of the participants (Falter et al., 2022; Stewart & Shamdasani, 2017).

3.4.2 Challenges in Interviewing Experts

Even with experts as a possible knowledge input source being accepted in practice and academia the selection, as well as the interview process itself is considered to be complex. There are several questions that arise as, *'What qualifies an expert as an expert?'*, *'How to extract information from experts?'*, or *'How to achieve reliability and validity?'*, and *'What are ethical considerations to be considered?'* (Boucher, 2017; Littig, 2009).

To get a broader perspective, it was considered to conduct these interviews with senior consultants of top tier international consultancy firms as Deloitte, Ernst & Young, Boston Consulting Group, Accenture, and CGI. Each of them

has a dedicated thematic focus section so called ‘practice’ on digitalization, spanning a high variety of sectors and company sizes globally. Representatives of these digitalization practices are expected to have a deep knowledge about certain subjects, in this case service digitalization and relationship management in the B2B environment, paired with knowledge from different companies of different sectors. Such practical knowledge would be of use to validate and complement insights from the literature review.

It is accepted in the literature that management consultants can have a major influence on how organisational change projects such as digitalization are led (Greiner & Ennsfellner, 2010; Shaw, 2019). However, the concrete value contributions of consulting services are highly debated in academia. Nikolova and Devinney (2012) state that consultants provide value through their specialised knowledge as well as their ability to moderate and therefore facilitate joint learning with their clients. However, they highlight as well that consultancy services often create impressions that their services are of special value with the help of advocacy of ephemeral fashions of management. Wright et al. (2012) point out that consultants often emphasise the mould breaking innovative character of their work, while the usage of standardized knowledge and methodological approaches is rather downplayed. Sturdy et al. (2009), as well as Retna (2015), point out that consultants can facilitate organisational changes in form of innovation by disrupting the status quo due to their status as outsiders. Even with some critical views on this innovative value of management consultancy work, it is accepted that consultants are a pool of overarching industry and subject specific established practices, as well as knowledge often referred to as ‘best practice’ (Sturdy, 1997; Wright et al., 2012). Some authors go as far as acknowledging consultants some kind of ‘disruption of dominant orders’ as they are freeing practitioners from the ‘iron cages’ that organizations can become (Clegg et al., 2004, pp. 36-37). In this respect management consultants can be seen as central players not only in the creation, promotion, and diffusion of new organizational practices as digitalization but also as facilitators of implementing them (Wright et al., 2012).

Besides the accepted use of management consultants as outlined above management consulting raises numerous topics about ethics of management

consulting itself. According to Shaw (2020) the unclear, emergent, as well as often socially constructed nature of management consultancy practice limits the scope both for objectively evaluating management consultancy and regulating the consultant profession in the manner of other established professions. As the outputs of management consultancy services are to a large extent intangible, clients have to rely profoundly on subjective impressions in order to evaluate what their benefits may be (Alvesson et al., 2009; Fincham, 1999). By contrast, for example with the medical science professions, there seems to be no management science that can reliably evaluate the effect that a specific management consultancy intervention has had (Shaw, 2020). In the light of ethical practice, Shaw (2020) proposes seven virtues that management consultants should have:

'… first, exercising prudence (phronesis) in their work for their clients, based on the training and experience necessary to complete the work effectively; Second, fulfilling in full the promises embodied in their contracts with their clients; Third, acting in the overall interests of their clients; Fourth, never giving priority to their own financial or other interests over those of their clients; Fifth, taking considered risks in their consultancy interventions in the interests of their clients; Sixth, engaging actively with their clients and their interests; and seventh explaining clearly to their clients the extent and limitations of their ability to help them.'

(Shaw, 2020; p. 41).

As a summary to the utilization of management consultants as expert interviewees the following can be stated. From a methodological point of view management consultants can be regarded as experts as they can have high insights in aggregated and/or specific knowledge such as digitalization (Van Audenhove & Donders, 2019). In addition, this specific knowledge is often complemented with insights from different sectors in form of managerial practices such as 'best practices' (Wright et al., 2012). In this respect, management consultants can be seen as a good source of latest knowledge with regard to digitalization in different sectors in this exploratory phase of this research project. In addition, using management consultants could be a

possible broader complement, due to their multi-company project experience, in comparison to insights gained from literature review articles that were often sector and/or company specific. However, besides the advantages of using management consultants as informants, possible downsides as outlined above (Ephemeral fashions of management, ethical considerations etc.) have to be considered and mitigated.

In a first step, it appears therefore reasonable to consider management consultancy firms only, if they fulfil the requirements of good and foremost ethical managerial practice for management consultancy as proposed by Shaw (2020). It is therefore proposed to decide on management consultancy firms that submit themselves to ethical standards. In this respect the selected management consultancy firms such as Ernst & Young, Deloitte, Boston Consulting Group, as well as CGI seem reasonable as they commit themselves to professional as well as ethical standards that materializes in form of code of conducts (Boston Consulting Group, 2021; CGI, 2019; Deloitte, 2020; Ernst & Young, 2020). In a second step, selected expert interviewees have to fulfil certain criteria for DBA project as outlined in the literature (Bogner et al., 2009; Bogner et al., 2019). In this respect, interviewees must have experience of at least ≥5 years in the field of digitalization, having experience from ≥3 sectors as well as ≥5 consulting projects in different companies to provide a more generalisability of insights gained to fulfil selection criteria of experts as proposed by Bogner et al. (2009).

To take a dyadic view on value from a provider and user side, two additional criteria within the expert selection process were set. The expert would need to have experience on different levels along the industry value stream i.e. having conducted projects down-stream and upstream the industry value chain. In addition, selected experts would need to have experience with end users of digitalization projects meaning stakeholders that will eventually use or be affected by new digitalization service. The latter is important to complement aspects of digitalization on the provider side with aspects on the user side enabling a dyadic view on the subject as suggested in the literature (Eggert et al., 2006; Hussain et al., 2020; Shree et al., 2021).

3.4.3 Validity and Reliability in Explorative Expert Interviews

To achieve validity, content- and face validity are suggested in the literature (Saunders et al., 2016). Nunally and Bernstein (1994) have defined ‘content validity’ as the degree to which items represent an appropriate sample of the content domain of different constructs. ‘Face validity’ is defined as reflecting the degree to which a measure reflects what it is intended to measure (Nunally & Bernstein (1994). The dart analogy of Hardesty and Bearden (2004) is apt here:

‘In order for the criterion of content validity to be established, darts must land randomly all over the board to obtain a proper representation of the construct. Therefore, if darts were located on only the left-hand side of the board (i.e., items were measuring only half of the domain of a construct), the measure would not be content valid. Relatedly, if items are generated that are too similar and do not tap the full domain of the construct (i.e. the entire dartboard), content validity is not established. Using the dartboard analogy, an item has face validity if it hits the dartboard otherwise, the item does not represent the intended construct. Therefore, researchers must ensure that the items in the initial pool reflect the desired construct (i.e., hit the dartboard).’

(Hardesty & Bearden, 2004; p. 99).

The use of expert interviewees raises other concerns. Expert interviews are accepted sources of qualitative research in the literature (Saunders et al., 2016). Still, selecting the right experts is regarded as a main methodological problem (Bogner et al., 2019; Creswell & Creswell; 2018; Häder & Häder, 2000). However, the validity of information gathered via expert interviews depends on the expert. To address this challenge an expert review process as proposed by Creswell and Creswell (2018) was chosen and can be summarized as followed: 01. Consultancy firm selection: top tier international consultancy firms were chosen as they are having dedicated codes of ethics, broad industry knowledge, cross-country international engagements, and pool of specialised consultants with focus on B2B digitalization and strong ‘best practice’ knowledge share culture to exchange latest developments and insights.

02. Interviewee selection: Senior practitioners were chosen that qualified as experts with at least ≥5 years' experience in B2B digitalization, having conducted ≥5 Projects in ≥3 sectors.

The size of the interview sample was determined with a view to the DBA project timescale and to the purpose of this research project (Flick, 2018; Miles & Huberman, 1994), as well as considering benchmarks for samples sizes from social science research literature and previously conducted studies in the field of digitalization (Ramaseshan et al., 2015; Salo et al., 2020; Saunders & Townsend, 2016; Wittko et al., 2018). In more detail, Ramaseshan et al. (2015), researching B2B self-service technology readiness, conducted eight expert interviews each lasting between 45min to one hour. Salo et al.'s (2020) data addressed the influence of digitalization on buyer-seller relationship based on 11 semi-structured expert interviews. Wittkop et al. (2018), researching how digitalization changes the internationalization of entrepreneurial firms, engaged in six semi-structured interviews with representatives of digital companies.

Even though sample sizes of previous research projects within the same domain can help to give a certain orientation it highly depends on the individual research case and available resources as pointed out in the literature for example by Baker and Edwards (2012) in their paper on *'How many qualitative interviews is enough?'*.

A considerably amount of attention has been attributed to data saturation. According to Glaser and Strauss (1967), and Flick (2018), data saturation in qualitative research can be considered to be reached if no significant further insights are emerging. In this research project this was tracked by interview analysis measures as it is outlined in data and analysis c, most of all using Nvivo as a qualitative data analyzing tool translating words to text and text to codes as well as themes (Jackson & Bazeley, 2019). In reality it is accepted to be challenging endeavour to decide on when data saturation has occurred. However, it can be questioned if in social science a phenomenon can be 'fully' explored due the dynamic nature and underlying other factors (Braun & Clark, 2021; O'Reilly & Parker, 2013). The reality in this research project was that there was a rich contribution of new insights up to the sixth interview (excluding

pilot interviews) and I felt that certain topics had begun to reoccur already after the initial few ones. With this effect, and the interview series' objective to validate and complement insights from literature review in an explorative way, on which another research attempt shall follow, I decided to stop the after the eighth interview which gave me a pool of 437 minutes or 7.3 hours of audio data to be analysed (see Table 5).

Table 5: Overview Expert Interview Partners From Top Tier International Consultancy Firms

01. Interviewee	02. Years of prof. experience / Experience in B2B digitalization	03. Projects in B2B digitalization	04. B2B Sectors	05. Duration / Words
Pilot 1 (DE)*	9 / 9	40	• NGO • Digital Economy • Telecommunication	(49min)
Pilot 2(DE)*	18 / 9	29	• Telecommunication	(52min)
Consultant 1 (DE)	29 / 25	50	• Manufacturing • Pharmaceuticals • FMCG	58min / 7.418
Consultant 2 (US)	25 / 5	10	• Professional Services • Software • Technology	52min / 6.386
Consultant 3 (US)	25 / 12	80	• Pharmaceuticals • IT • Manufacturing • Hospitality • Energy • Utilities	64min / 9.276
Consultant 4 (DE, CH, AU)	10 / 9	10	• Retail • Wholesale • Manufacturing	53min / 5.967
Consultant 5 (DE, CH, AU)	10 / 10	8	• Telecommunication • Manufacturing • Retail	53min / 7.376
Consultant 6 (UK, EU)	35 / 20	10	• Energy • FMCG • Transport • Financial Services	58min / 8.506
Consultant 7 (DE)	17 / 9	10	• Automotive • Energy • Telecommunications	49min / 7.744
Consultant 8 (DE, CH, AU)	26 / 10	30	• Telecommunication • Energy • Software • Information Technology	50min / 7.126
Sum:	**204 / 118 years**	**277 projects**	**16 sectors**	**7.3h/ 59.799 words**

**Pilot interviews not included in coding*

3.4.4 Interview Questionnaire

As a foundational basis for all semi-structured expert interviews a questionnaire was created (see Appendix II, Figure 44). It was underpinned by a detailed research plan that was constructed based on literature review undertaken and research priorities. In this respect the main objective of expert interviews was to explore RQ1 and RQ2 by including specific questions in the questionnaire.

3.4.5 Interview Data Analysis

To analyse the vast amount of information gained the following steps were conducted.

In a first step the 7.3 hours of interview audio recording were transcribed accounting for 59.799 words (see Table 5). To facilitate the transcription process, seven out of eight interviews were transcribed with the help of an external transcription service agency specialised in academic services. One interview was transcribed by myself to experience first-hand the very nature of a transcription process. To focus on the expert interviews themselves, as well as out of capacity constraints, and to undertake the expert interviews in short timeframe to recall latest information, I decided to make use of this external support. The agency was chosen based on positive experience of other academics in form of online ratings, as well as on the basis of provision of adequate data security measures in order to fulfil data privacy requirements in line with SHU requirements. A full transcript of one interview can be found in Appendix IV.

In a subsequent step this transcribed data was coded in Nvivo, an accepted coding software in the field of qualitative research (Dalkin et al., 2021). The author took a two-day online course provided by the University of Hull in 2020, the Nvivo license was provided by SHU IT department in February 2021. Within the process of coding, and to give a preliminary structure to an initial set of coding themes, so called ‘nodes’ in Nvivo were established based on finding of literature review (see Appendix II, Figure 46).

This initial set of nodes was extended during the process of coding the interviews as numerous themes and subthemes appeared which sum up to a total of 83 nodes having on average 19 references each with a median of 12 reference per node. The nodes identified were clustered arriving at a coding theme overview as some kind of thematic spider-web on B2B relationship digitalization (see Figure 22). The Nvivo coding analysis revealed themes based on number of codes and sub-codes on the topic of B2B relationship digitalization that will be used to structure the summary (Braun & Clark, 2020; Castleberry & Nolen, 2018; Vaismoradi et al., 2013).

Coding in its basic form can be seen as the activity to identify separated segments of meaning in a pre-defined set of data by labelling them with a code (Lenneberg & Korsgaard, 2019). A code can be defined as:

'… a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data.'

(Saldaña, 2013; p. 3).

The literature offers thematic and content analysis as two basic qualitative descriptive approaches for analysing codes. Even with their common use in qualitative research, boundaries between the two methods are not clearly defined with the result that in research practice they are used interchangeably with many researchers having difficulties choosing between them (Vaismoradi et al., 2013; Vaismoradi & Snelgrove, 2019).

Thematic analysis is classified in the literature as an independent qualitative and descriptive method that identifies, analyses, and reports certain patterns, so called themes, within a data set (Braun & Clark, 2006; Braun & Clark, 2021).

Content analysis is a systematic categorizing approach focusing on quantifications for exploring large sets of textual data unobtrusively in order to determine patterns and trends of words employed, the discourses and structures of communication, their frequency and potential relationships amongst them (Mayring, 2015 & 2019).

In spite of several commonalities between thematic and content analysis as searching for common themes and patterns based on textual information analysed, the main difference highlighted in the literature is based on the possibility of very detailed quantification of data in content analysis by measuring themes and categories with regard to their frequency (Braun & Clark, 2021; Vaismoradi et al., 2013; Vaismoradi & Snelgrove, 2019). However, even with several efforts in the literature to differentiate thematic and qualitative content analysis there are other streams that try to highlight the similarities as there is an indication that there is no one approach to either content analysis or thematic analysis both having common roots. Braun and Clark (2021) proposed a 'family analogy' by saying:

"… it is useful to imagine thematic analysis and qualitative content analysis as two related 'nuclear families', each with lots of children. There is lots of variation within each family, and lots of points of connection, and some differences, between the two families."

(Braun & Clark, 2021; p. 40).

According to Braun and Clark (2021) qualitative content analysis and thematic analysis seem to be parallel developments having more or less common similarities and overlaps. As a consequence they question the usefulness of considering them as distinct methods. However, they also acknowledge that with the two families being established in research, with neither one of them disappearing, choosing the one or the other will largely depend on the research context.

For this thesis a thematic analysis having supporting quantitative elements in terms of numbers of references made was chosen. This approach seemed to have the best fit based on the research context and underlying research questions out of the following reasons.

First, as the potential of B2B service digitalization in relationship value management has a strong explorative character the focus of the research is more on the identification and evolvement of general 'themes' from the data gathered. The emergence of thematic categories from the data throughout the

coding process would be an indication for thematic analysis proposed by Saldaña (2013).

Second, even with the identified main themes having a quantified basis as numbers of codes and sub-codes this quantification served primarily as a helpful asset. Such quantifications of elements were not subject to further detailed analysis up to the level pointed out in the literature that content analysis analyses in detail who said what, to whom, and with what effect (Bloor & Wood, 2006; Vaismoradi et al., 2013).

Third, the combination of thematic analysis elements and some elements from the field of content analysis seems to be a reasonable fit for the underlying research philosophy of the author which is pragmatism and approach to theory development which is abduction, due to their integrative character. In detail, within a pragmatist approach both qualitative and quantitative elements can be employed if it answers the underlying research questions best (See Section 3.2 & 3.3). The same applies for abduction which can be considered as a research approach to theory development that combines deductive and inductive elements. In this respect the data analysis approach employed in this research project includes elements that originate from thematic analysis as well as content analysis. In the literature the combination of different elements has resulted to the application of titles such as ‘thematic content analysis’ which can be seen as another indication that a combination of thematic analysis and content analysis elements is potentially feasible (Oliveira et al., 2013; Yu, 2020).

As a result of the explorative expert interview a thematic spider map was produced that can be read as followed (see Figure 22). Starting point is the overarching theme of ‘digitalization’ that can be found in the centre. From this centre several sub-themes emerge.

‘Definition’ - in other words ‘defining digitalization’ was identified as a sub-theme having several categories as different perceptions of digitalization from consultants and their clients.

Another sub-theme was ‘value’ i.e. what is the ‘value of digitalization’, conceptualized as the sum of benefits and cost from a provider and user perspective (dyadic perspective).

In addition, ‘influencing factors’ i.e. what influences a company to digitalise or not were identified, revealing that influencing factors can be divided in external and internal influencing factors as well as corresponding challenges.

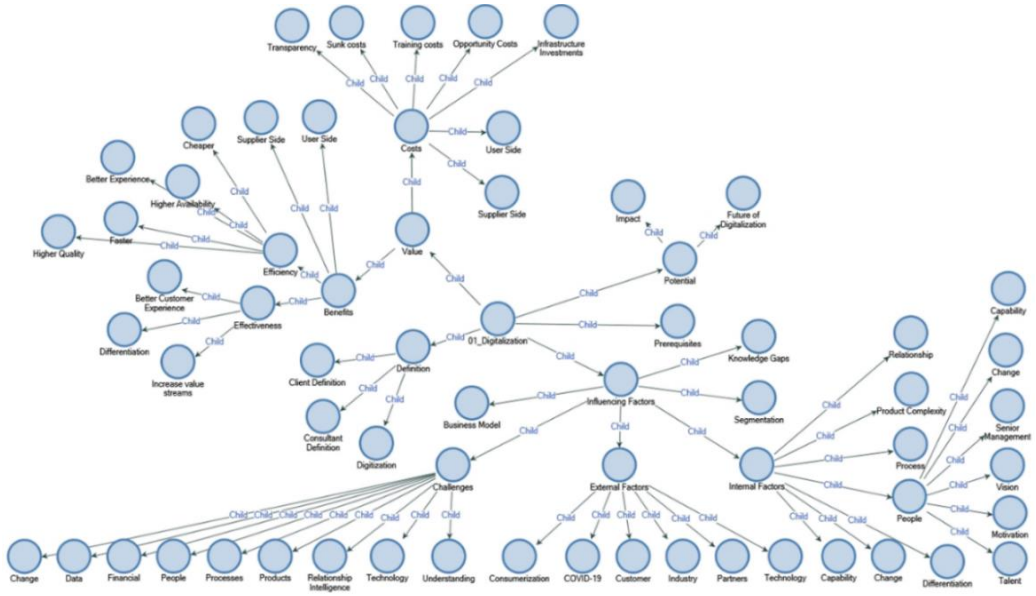


Figure 22: Expert Interview Coding Theme Overview in B2B Digitalization

3.5 Methodological Choice and Case Study Theory

This research stage aims to explore, understand, and interpret how B2B organizations employ service digitalization to maximise relationship value. As value digitalization perspective can be employed from an efficiency and effectiveness angle, as identified within the expert interviews (see Section 4.3), these two angles shall be reflected in following research approach based on two case studies.

First, the value contribution of service digitalization having an efficiency focus - in other words, ‘Doing things right’ will be explored. Second, the value contribution of service digitalization having an effectiveness focus ‘Doing the right things’ will be researched.

The focus of the two case studies will be on the ‘service digitalization journey’ meaning, how the companies decided, implemented, and managed their digitalization activities. A focus will be on project-team set ups, realised potentials, as well as challenges that occurred, and how they were managed.

As case study research allows exploration and understanding of such complex beyond a pure quantitative cause-effect analysis it is regarded as a more appropriate choice for complex topics as B2B digitalization endeavours (Saunders et al., 2016).

A case study can be seen as a structured and systematic inquiry into a set of related events or single events with the purpose of describing a certain phenomenon of practical or scholarly interest.

Yin (2018) defines case study research as:

'An empirical enquiry: that investigates a contemporary phenomenon within its real-life context; when the boundaries between the phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.'

(Yin, 2018; p. 34).

In the case of this research project a case study will be used to gain real world practical insights of two B2B organizations, one having employed technology in form of digitalization to lift predominantly efficiency gains (Doing things right) the other effectiveness gains (Doing the right things) with the purpose of creating predominantly new innovating services. This research project builds on broad and deep experiences of first-hand experience of two B2B corporate organizations that went through the whole process of conceptualizing, implementing, and managing lifecycle activities in the field of service digitalization. Hence this research project will give insights on broad range of experiences made, challenges occurred as well as managed, and therefore enriching the proposed initial B2B digitalization framework by exploring and possibly complementing it by in-practice examples.

To gather data in the proposed in-depth case study, semi-structured interviews were used for several reasons (Klein & Myers, 1999; Myers, 2019). First, semi-structured interviews are regarded useful when the researcher has some prior knowledge about a certain topic, giving the participants the opportunity to raise new issues (Bogner et al., 2009). Second, semi-structured interviews are useful when complex issues, as B2B service digitalization activities, are explored as spontaneous questions and probes can be employed to clarify and deepen

understanding. As a general structure that should lay the basis of comparing the two cases the in phase identified influencing factors are used i.e. Vision, Business Model, People, Data & Technology, Change Management, and Financial (see Section 4.6). The co-production and co-creation literature has proposed the use of current or future users perspective of B2B digitalization systems as input sources which would support the intended approach which will be integrated in this research (Green et al., 2017; Saha et al., 2020).

However, where there is light, there must be shadow meaning that besides all the advantages of an interpretive in-depth case study, exploring a certain case in detail, the downsides are not to be underestimated. Downsides would include problems as to what extend such finding are generalisable. In more detail, findings in one case study, based on one company, is bearing the risk of a limiting effect to that very organization only having possibly little to no value for other organization (Flick, 2018).

To secure academic rigour of the case study set up the seven principles for interpretive research by Klein & Myers (1999) were followed (see Appendix III, Table 28). The purpose of the case study research is to shed light on the following questions. In general, ‘How do B2B companies manage service digitalization projects in practice?’ (see Section 5.1 & 5.2).

In more detail, ‘What are the potential challenges and learnings?’, ‘What are in practice similarities and/or differences of adoption dimension in B2B efficiency and effectiveness service digitalization activities and corresponding challenges and learnings?’.

In addition, ‘How is relationship value enhanced, having what specific underlying benefit- and cost elements, for whom?’.

Answers to these questions shall place managers in a more informed position on which they could better sell, decide on, plan, and execute their digitalization projects. From a contribution to knowledge perspective, answering these questions would add to the scarce pool of research in B2B service digitalization and give detailed information. This information would enrich existing models with more granular information from practice, incorporating different perspectives from relationship management theory, technology theory and

value theory (see Figure 12). Besides the methodological challenges of case studies, ethical aspects must be highlighted. Literature is pointing out several challenges that researchers should be aware and mitigate in case study designs and whilst conducting it. Avoiding coercion is highlighted as one main aspect meaning to deal with the potential risk that some participants may not have wished to participate in the research (Haines, 2017). The author took several mitigation actions to avoid coercion. As consent can be always seen provisional (Simons, 2014), the process consent model by Dewing (2007) was employed by focussing on repeated and on-going informed consent. In detail, besides preparing different formats as the participant information sheet as well as participant consent form; participants were asked when being invited, in the beginning, and during the interview if they are comfortable engaging in and continuing the conversation (see Figure 47 & Figure 48).

3.5.1 Case Approach and Data Collection

The data collection process was an iterative approach, following the recommendation of Walsham (1995) and Yin (2017 & 18) that point out the importance of 'thick descriptions'. Thick descriptions shall give account of complex, possibly intertwined structures in organizations as well as to be open to new insights within the process that have not been foreseen. In this respect, possible new ways of investigation might be required including additional stakeholders as key informants.

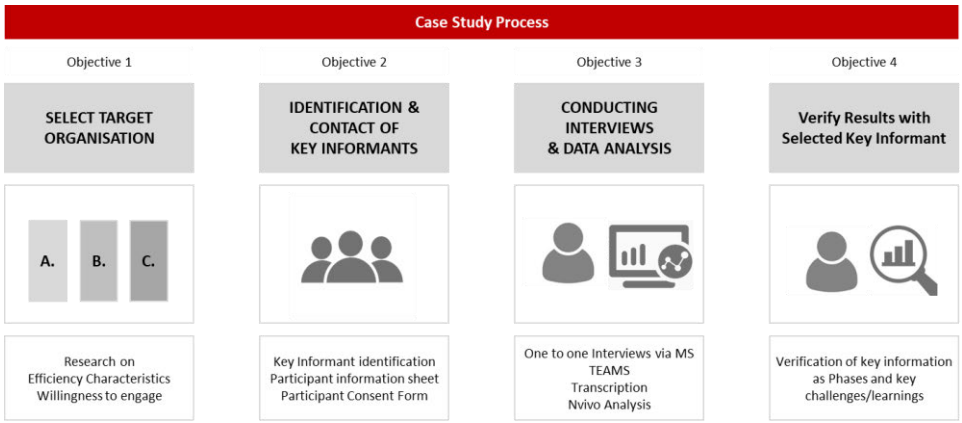


Figure 23: Case Study 1-Data Collection Process.

3.5.2 Case Study 1- Interviewees and Timeline

After initial contact with the senior management of case study 1 (Efficiency Co.) in summer 2021, and following conversations to decide on formal pre-requisites such as confidentiality requirements, and interview formats etc., data collection took place over a period of four months from November 2021 to February 2022. Important data sources were for the main part semi-structured interviews followed by unstructured informal conversation before and after the formal interviews both qualifying in the literature as potential insightful sources (Myers & Newman, 2007). Informal conversations were not coded but helpful as references to other informants were made i.e. 'One more thing, you should talk to Mr X. and/or Mrs. Y!'.

Key informants were chosen based on their functional, strategic, and operational connection with the digitalization activity covering different disciplines that were affected by the digitalization endeavour as Sales, Service, Programme Management, Information Technology, Workers Council, and others. Key informants were selected not on the basis that they were selected representatives for the members of Efficiency Co. as a company in any statistical sense but because they were knowledgeable about the research case as well as Kumar et al. (1993) puts it:

'… able and willing to communicate about it'.

(Kumar et al., 1993; p. 1634).

After an initial set of interview partners identified, new interview partners were successively integrated i.e. a former programme lead having left the company few years ago, one member of the workers council, and an external user working with the self-service application at a corporate client specialised in textile retail having more than 15.000 employees. This iterative and open interview process is in-line with the hermeneutic principle of interpretive field research which accounts (Klein & Myers, 1999; see Table 6). The main part of interviewees were members of Efficiency Co.'s Service, Sales and IT organization meaning internal employees. External interviews of Efficiency Co. include the former program implementation lead that has left Efficiency Co. four

years ago as well as a representative of a B2B client actively using the self-service application. In total, eight key informants were interviewed that were directly involved or use the Efficiency Co. self-service portal (see Table 6). Once the initial set of prospecting key informants had been completed with the help of Efficiency Co. senior management the interviewees were contacted with a set of details of the research project (Scope, duration, period etc.). Once the key informants agreed to participate in the research project, they received a detailed briefing deck about the study including participation information sheet and -consent form as well as the initial list of questions (see Appendix IIIa). These questions were organised in an interview guideline to ensure that those themes were consistently addressed and discussed in all interviews. The interview guideline and corresponding questions were structured along the 'Digitalization Adoption factors' that were identified in the phase 1 explorative interviews (see Section 4.6) i.e. Vision, Business Model, People, Data, Change Management, and Financial Aspects.

Table 6: Efficiency Corporation Case Key Informants

Efficiency Corporation Case – Key Informants				
01. Interviews (in consecutive order)	**02. Role/Tasks**	**03. Years of experience**	**04. Years of connection with EfficiencyCo. self-serve**	**05. Duration / # Words**
#1 Employee – **Project & Communication Mgr.**	• Ensuring communication activities within project	11	7	76 min / 12.982
#2 Employee – **Senior B2B Sales Lead**	• Raising demands on the self-serve tool • Ensuring tool adoption in sales	37	7	73 min / 11.405
#3 External (Former Employee) – **Digitalization Programme Lead**	• Conceptualizing & management self-serve tool roadmap	20	2.5	76 min / 11.714
#4 Employee – **Senior Mgmt. – B2B Service**	• Commercial owner – investment mgmt. & case delivery	23	4	72 min / 9.479
#5 Employee – **IT & Technology Manager B2B**	• IT specification & realization manager	11	8	70 min / 12.213
#6 Employee – **Senior IT & Technology Lead**	• IT specification & coordination lead	30	9	55min 9.112
#7 Employee – **Workers council representative**	• Advocating employee rights as personal data & job security	42	5	47min 7.194
#8 External Client - **Procurement services**	• Using self-serve tool for procurement services • Introduction tool to other departments	7	4	44 min/ 6.799
Sum: 8		**181 years**	**46.5 years**	**8.55 h/ 80.898 words**

Interviews were digitally recorded and subsequently transcribed. Informal conversations were documented without any digital recording but by hand note writings during or directly after the interview, which is an additional and accepted data collection technique in the field of qualitative research suggested by several authors (Schurr, 2007; Yin, 2018). Total interview duration was 8.55h accounting for 80.898 words (see Table 6). In addition to the formal and informal interview notes from internal and external sources, further information was gathered by screening existing handbooks and presentations. Such formats were used as basis of comparison or to complement information provided in the interviews. Handbooks would include employee and customer hard-copy and digital training material in form of recorded online tutorials and website information.

3.5.3 Case Study 2 - Interviewees and Timeline

Effectiveness Co. was identified as a potential effectiveness use case through an internet keyword search on B2B service innovation use cases. As a company, and because of the introduction of the digital platform as an effectiveness measure, Effectiveness Co. fit the parameters for this research project: It is a B2B company that is offering new services based on technology and has experience throughout the entire implementation process as well as first feedback from customers. After an initial contact to Effectiveness Co., the internal project lead was approached in summer 2021.

Following a series of conversations to determine the formal pre-requisites as confidentiality requirements, decide on the interview format, and compile a first short list of potential interviewees, a non-disclosure agreement was signed in autumn 2021. Data collection took place over a period of five months from October 2021 to February 2022, with the main data sources being semi-structured interviews.

The data received from the interviews was enriched with unstructured informal conversations before, after, and between the interviews, as well as a set of

internal materials provided by the Effectiveness Co. The latter was not coded as the coding scheme was focussed on conversational information retrieved from the interviews only and out of sensitivity reasons. However, the information within internal materials helped the author to understand the object much better. The use of such information is accepted in qualitative research, as it is seen as potential source of ‘thick description’, referring to in-depth details of the specific organizational and personal context (Flick, 2018; Yin, 2018).

Key informants were chosen based on their functional strategic and operational connection to the digital platform covering a wide array of disciplines – service, sales, and technology – as well as different managerial levels. They were selected not in any statistical sense but because they were knowledgeable about the research case. Approaching and managing the Effectiveness Co. interviewees followed the same procedures as outlined in Case Study 1 (see Section 3.5.1).

The interview guideline and underlying structures including identified adoption factor elements were the same as in case study 1. Both measures, iterative interviewee approach and questionnaire were equally employed to lay the foundation of best possible comparison of the two case studies. In total nine interviews were conducted accounting for 9.7h of audio material and 82.731 words (see Table 7).

Table 7: Effectiveness Co. Case Key Informants

Effectiveness Co. Case				
01. Interviewees – current position	**02. Role/Tasks**	**03. Years of prof. experience**	**04. Years of connection with Effectiveness Co.**	**05. Duration / Words**
Interview 1: Internal Employee – **Head of Service Engineering**	• Internal overall project lead manager • Design, decision and demand mgmt. • Former Service Mgr.	22	3.5	81min /11.901
Interview 2: Internal Employee – **Sales, Marketing & Training Manager**	• Sales Marketing and training for Effectiveness tool • Internal & external communications	10	2.5	66min /9.124
Interview 3: Internal Employee – **Product Discovery & IoT Manager**	• Technical specification and support • Business development	8.5	4	76min /10.181
Interview 4: Internal Employee – **Chief Marketing Officer**	• Marketing and Business Development at Effectiveness Co.	25	5	72min /8.579
Interview 5: Internal Employee – **Managing Director Business Unit**	• Overall P&L responsibility • Former Product Development responsible	20	5	59min /8.482
Interview 6: Internal Employee – **Chief Sales Officer**	• Responsible for sales profit and loss including customer service & back office	22	7	55min /6.799
Interview 7: External System Integrator - **Account Responsible / Project Mgr.**	• Project Manager for new releases • Main Effectiveness Spoc 2020-today	5	1.5	54min /8.567
Interview 8: External System Integrator - **Account Responsible / Project Initiator & Manager**	• Project initiation, design, scoping & project management • Main Spoc for Effectiveness Co. 2019-2020	6.5	3.5	61min /10.175
Interview 9: External Client - **President Vehicle Rent /- Leasing**	• Managing director • Effectiveness Co. tool user and feedback source	30	3	60min /8.923
Sum: 9		**149 years**	**35 years**	**9.7 h/ 82.731 words**

3.5.4 Case Study Data Analysis

All interviews were conducted via Microsoft TEAMS, a virtual conferencing solution, recorded, securely stored, and fully transcribed into text. Interview audio files were anonymously transcribed by an external agency specialised in academic transcriptions, data exchange was managed via an end-to-end password protected and encrypted platform.

To focus on the case study interviews themselves, as well as out of capacity constraints, and to undertake the case study interviews in short timeframe to recall latest information, the author decided again to make use of this external support.

All the textual information that was generated served as a foundation for further data analysis in the context of content analysis (Mayring, 2014). Nvivo 12 Pro was used to as a qualitative data software to store, analyse and visualize interview data (Edhlund & McDougall, 2019). The author built on the experience with Nvivo 12 that he gained within the explorative expert interview phase (see 3.4.5). The data analysis methodology involved summarizing and structuring qualitative analysis based on coding (Mayring 2014, Table 8 & Section 3.4.5).

Table 8: Coding Examples Efficiency Co. - From Text to Meaning

Raw data unit // Text paragraph	Coding Levels // Nodes in Nvivo 12	Sub-theme and Meaning
'Already 10 years ago we compared ourselves with companies that were much more advanced than us in such fields as Amazon or Google or others and we had the ambition to be innovative.'	L1: Influence Factor L2: Market Environment L3: Macro Effects	An urge to be innovative. Copying best practices from other sectors that already have it.
'The huge advantage for us was that orders did not come in on paper or by fax or e-mail but in a structured way that could be used to automatically process it instead of doing it manually. That was the huge advantage for us.'	L1: Motivation to implement L2: Benefits L3: Due to Technology	Generating service frontline capacity to be re-used due to shift to digital.

In detail the following steps were taken:

(1) **Creation of a provisional coding scheme which was derived inductively from phase 1 explorative expert interviews** - in other words digitalization adoption factors as well as influencing categories as

overall code field, technically realised as nodes in Nvivo 12 Pro (see section 4.6).

This gave a high-level structure to organise interview data in broad thematic fields in the next step. Like a general ‘world map’ and provisional coding schemes were the ‘continents’ appearing.

(2) **Organization of original text transcripts in textual sub-sets to match step (1) categories and to identify relevant statements.**

This was important to match vast interview data to thematic fields - in other words giving structure to everything that was said and not to get lost in vast amount of information.

This was like bringing more detail to the ‘continents’, like countries etc. and the world map was filled with detailed information.

(3) **Inductive coding of interview data gathered - in other words all key informant interviews were coded. Coding units were single textual paragraphs consisting mainly of one statement**. Codes and sub-codes from step 1 were extended if textual paragraphs and underlying statements did not match initial provisional coding scheme.

This was necessary as provisional coding scheme was too high level for the taste of the author and broad meaning that sub-categories seemed feasible for more granular insights. Continents were added by oceans, countries by states, cities etc.

(4) **Analysing data by comparing everything that said in a certain categories or sub-category and therefore identifying underlying themes according to the thesis research questions**.

With all the preparatory steps before this was the more detailed work, revealing the main part of the insights. It was not just that there were more continents and countries appearing it was more that there were much more in-depth details were revealed.

3.6 Propositions as a Result of Qualitative Research Findings

This research seeks to offer various theoretical contributions based on qualitative research on the phenomenon of B2B service digitalization and relationship value. According to the various themes identified within the explorative expert interviews (see Section 4), in case study 1 (see Section 5.1), in case study 2 (see Section 5.2), and in the literature, corresponding findings are explained in detail. Findings are complemented by a conclusion in the form of propositions to answer the 'so what' question behind each topic as well as making connections on how findings are related to each other (Ebneyamini et al., 2018; Whetten, 1989). There is no agreement in the literature whether relationships of constructs should be expressed as a hypothesis or as a proposition (Cornelissen, 2017; Blumberg et al., 2014). Following the argumentation of Blumberg et al. (2014), a proposition is defined

'… as a statement about concepts that may be judged as true or false if it refers to observable phenomena.'

(Blumberg et al., 2014; p. 31).

and, therefore, can be used by researchers to state the results of their analysed observations. Testing propositions between two or more variables in the form of descriptive statements that are narrowly conceived in detail can be called a hypothesis (Lareau, 2012).

Therefore, on a more abstract level it can be said that:

'While propositions state relations among constructs, and on the more concrete level, hypotheses (derived from propositions) specify the relations among variables.'

(Bacharach, 1989; p. 500).

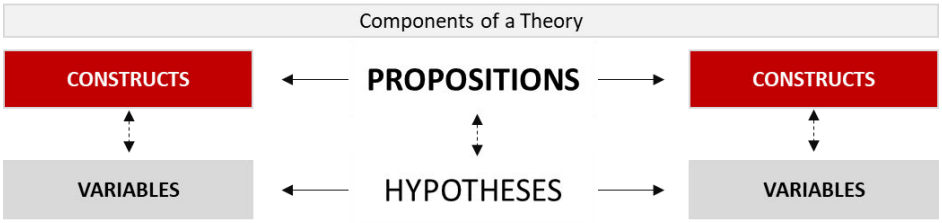


Figure 24: Components of a Theory by Bacharach (1989)

Based on these definitions, a proposition can be seen on a higher conceptual level than a hypothesis; it can be qualitative in nature rather than indicating a cause-and-effect relationship. Additionally, a proposition is not tested statistically but is explored through qualitative research methodology (Lareau, 2012). In contrast, hypotheses testing in the form of comparing two or more variables against each other requires data (see Figure 24).

For this research project having an explorative and purely qualitative research approach, it is decided to use propositions for the qualitative explorative interviews and subsequent qualitative case studies. However, as each choice made has its drawbacks, the following caveats are highlighted, proposing a set of mitigation actions. One of the most common challenges cited about using propositions is that propositions risk being quite narrow and capturing only basic cause-and-effect relationships (Cornelissen, 2017).

A further problem highlighted in the literature is that researchers often propose far too many propositions and that authors tend to unnecessarily formulate their propositions around basic building blocks (Kilduff, 2006). There often may not be a single action for addressing these challenges, but Cornelissen (2017) proposes the following mitigation actions. First, authors should be objective for a much larger canvas when formulating their arguments. Second, authors should start to write out their arguments in full before engaging in any formal process of formulating propositions. In this sense, propositions are a summary of statements that capture the different arguments presented in a more formal and abbreviated manner and that can act as a bridge to any subsequent empirical research. Using the same logic, a proposition should naturally follow the previously stated argumentation such that an audience reading only the

proposition could understand the substance and nature of the argumentation (Blumberg et al., 2014; Cornelissen, 2017).

3.7 Ethical Considerations

Ethical impacts of the research topic and the research process itself must be highlighted. There were different formal steps to take in preparation for this thesis as taking a module on ‘ethics in research’, as well as conducting a formal approval process granting ethics clearance for this research. This research project ethic approval can be found under the Conversis-ID: ER10023790 at Sheffield Hallam University (SHU) repository.

With regard to ethics, the author realized within the SHU reflection module that he has an overall positive attitude towards service digitalization.

Taking a critical stance, this positive attitude towards digitalization might lead to a tendency of the author to present the topic too optimistically, overlooking possible disadvantages from the neutral position a researcher should take.

As a mitigation action the author has chosen to engage in a reflective process by critically analysing positive and negative aspects of the research topic and to arrive at a more informed position.

On the one hand, the megatrend of digitalization, and service digitalization within, is perceived as one possible answer for creating new value opportunities by managerial practitioners and numerous scientific sources (Johns, 2012; Floridi, 2015). On the other hand, this megatrend is also seen in the literature as a vehicle for cutting human resources costs, especially when it comes to generating efficiency gains. This is further fuelled by the perception that service digitalization bears additional risks, as digital processes might overtake work done by humans, perhaps igniting a negative discussion of robots versus humans (Khatib et al., 1999). In the current discussion, service digitalization means that the manual work by employees can partly or fully abolished or overtaken by computers and automated processes (Prusty, 2013).

From the author’s perspective, these are valid points to consider while reading the thesis in terms of ‘How will service digitalization change organizational

culture, identity, and the like?' and 'Are the benefits outpacing possible downsides and, if yes, by how much?' (Fikirkoca, 2007; Floridi, 2015).

In addition to changes in organizational culture raising possible ethical concerns, other fields are highlighted in the literature regarding digitalization and ethics. In their systematic literature review of 278 articles in the digital ethics space, Terán et al. (2021) highlight a classification scheme comprising three focus areas: (digital) service, technology, and sector. Examples of articles regarding ethical challenges with service include satisfying people's hyper connection needs in a digital environment for smart cities, government, and healthcare. Sholla et al. (2017) address the challenge of data security and privacy integrity while also providing people-friendly services.

Within the field of technology, Rhem (2021) proposes guidelines for artificial intelligence (AI) algorithms that are applied to deliver information and knowledge to decision makers, ensuring that this knowledge is bias-free and that decisions made fulfil ethical standards. Other examples in this space include the works of Munteanu et al. (2021), which highlight the challenges of so-called ethical traps in human–computer interaction.

Digital discrimination is researched by Criado and Such (2019), who investigated how certain user groups are unethically, unfairly, or differently treated based on their data inputs, which are processed automatically by a series of algorithms. The authors discovered that digital discrimination can result from bias sets inherited from the real world, resulting in widespread societal prejudices in programmed digital solutions. As service, technology, and data management are foundational topics in this thesis, these ethical challenges are important to highlight. With this sub-section on ethics and corresponding reading, the author is more aware of and sensitive to ethical practices and challenges in the richness and complexity of this field (D'Aquin et al., 2018; Guillemin & Gillam, 2004).

Besides ethical considerations of the topic itself, several references on ethics within the following research methodologies themselves are presented. Within section 3.4.1 and 3.4.2 ethical aspects of using consultant as experts are highlighted. Chapter 5 will highlight aspects within organizational case studies.

It is the intention of this research to engage in a reflective process throughout the whole research process i.e. layers of the research onion (see Figure 20), highlighting ethical aspects wherever appropriate.

3.8 Summary Research Design and Methodology

Several key topics with regard to research design and methodology were covered in this chapter.

First, the research design for this research project has been set following the recommendations of Saunders et al. (2016). In detail, the different layers of the 'research onion' were explained (see Sections 3.1 – 3.4). Two key elements were the discussions on the 'approach to theory' within this research project which will be abduction, and the underlying research philosophy of the author which is pragmatism (see Section 3.2 & Figure 20).

Second, the different methodological steps have been outlined i.e. expert interviews, and case studies (see Figure 21).

Third, to explain relationships of different constructs in this research project the concept of 'propositions' was introduced (see Section 3.6).

Fourth, ethical consideration concerning the methodology and the research topic itself were highlighted as digital discrimination besides others (see Section 3.7).

4 RESEARCH STAGE 1 – EXPLORATIVE QUALITATIVE EXPERT INTERVIEWS

4.1 Explorative Expert Interview Findings

Based on the information gained from eight expert interviews on B2B service digitalization this Chapter will outline the main findings. To structure the vast amount of information received along different dimensions of B2B digitalization (see Figure 22 & Figure 25) a two-step approach was done.

In a first step, the structure of the interview questionnaire (see Section 3.4.4 & Appendix II) was used to cluster the qualitative feedback received per thematic field.

In a second step, quantitative data gained from coding the interviews in Nvivo was taken to underpin information found, highlighting noteworthy findings that support, complement, as well as provide another perspective to findings from the initial literature review.



Figure 25: Expert Interview B2B Digitalization Theme Cloud

4.2 Different Perspectives on Business-to-Business Digitalization

It can be stated that the field of B2B service digitalization has been confirmed by all interviewees to be a highly relevant and contemporary topic with enormous impact on how business is and will be conducted. However, the potential impact comes along with a multitude of knowledge gaps and challenges to be addressed.

Reasons of digitalization being a high impact topic are numerous ranging from widespread efficiency and effectiveness benefits in doing business, and a broad availability of technology, to the existence of certain beneficial timely momentum of the COVID-19 pandemic fuelling the need of digital solutions when physical restrictions persist (see Section 1.1).

A first outcome of the interviews was that besides an established definition of digitalization in the literature (see Chapter 2), there seems to be different understanding and/or interpretations on the consultant- and client side (see Table 9).

Digitalization is heterogeneously understood especially on the client side. One understanding is that digitalization is about technological aspects as digital tooling, and software updates only. In this sense, it became apparent that some clients perceive digitalisation within a very narrow scope as for example with certain types of software solutions or e-commerce related aspects only. In e-commerce settings activities that were previously done within a in-person exchange are now available electronically (Previously order taken via telephone, within e-commerce via a self-service online tool); however, the very process that something is ordered, and the underlying product stays the same.

According to the interviewees, digitalization is sometimes understood on a client's side solely to help existing sales- and service activities to become more efficient i.e. improving the status quo by generating some efficiency gains as making the process faster, more reliable, and in the end possibly cheaper; however, not changing the process itself. On the other hand, there are B2B companies that understand digitalization on a much broader scale going beyond

a narrow definition around technology, sales- and service optimizations, or e-commerce.

There are companies that see digitalization as a mean to increase efficiency in existing processes in sales and services. However, in addition to such more operational and efficiency bound examples, digitalization has a supplementary, more strategy-oriented, role for them, as it can be a mean to fulfil a business strategy. This can happen by creating a unique selling proposition with the help of technology in form of digitalization to better serve customers, to build a new service, product, process, or an entirely combination of it that would have not been possible before.

One of the main themes mentioned in the context of technology requirements to create such new aspects was the term ‘data’ (see Figure 46). Being able to capture, analyse, understand, and interpret, use, as well to share data within the internal and external organisation with partners and clients was mentioned to be fundamental. There seems to be B2B companies that share the same understanding on ‘data’ as the consultants do (see Table 9: Type 2 customers).

In contrast, there are companies that understand ‘data’ on a much narrower scale such as making analogue information digital in form of Microsoft Excel files, or with the help of SAP systems, ignoring the fact that such narrow definition addresses just the ‘gathering data’ aspects of the data usage process outlined above (see Table 9: Type 1 customers).

An interesting aspect of digitalization was that several interviewees mentioned that it develops over time in phases. It seemed that digitalization as a concept started off to be connected strongly with e-commerce and e-commerce only i.e. making products and services available online. In this sense digitalization was more seen as a pure IT capability, offering existing information within an online interface. This is interesting as much of the digitalization adoption-literature is focussed on e-commerce (Haryanti et al., 2020; Sila, 2015).

However, at some stage organisations took a more strategic view on digitalization as it could influence the business model of organisations and with it changing the ways products/services are designed, offered, distributed, and managed. According to the interviewees, only recently aspects like

organisational agility, i.e. the ability of organizations to respond to change, seem to have entered in the understanding of digitalization. This meant broadening the term ’digitalization’ from a in the first place pure technological to a more holistic construct that incorporates technological, intra- and inter-organisational, as well as environmental factors. However, this view does not seem to be adapted by all companies, and that different levels of understanding towards digitalization exist in the market.

‘I think within the last few years, and it is only really the last few couple of years, we've started to realize that actually, it is a lot more around business agility, the ability of the organization to respond to change, any type of change, and the organizational-cultural working practices element of that. …

Some still see it as just the technology, some people see it as a combination of the business model. And some of the, I would say, the thought leaders are starting to understand that it's about the operating model and the culture.’

(Consultant 6).

As a summary it can be stated that digitalization is still heterogeneously understood in managerial practice (see Table 9). There seems to be a more homogeneous definition to digitalization and what it stands for on consultant side. Understanding on client’s side differs tremendously (see Table 9: Type 1 and Type 2 customer). In addition, how digitalization is understood seems to be dynamic as it developed over time.

Table 9: Digitalization From a Consultant and Client Perspective

Aspects	**Consultant Perspective on Digitalization**	**Client Perspective on Digitalization**
Definition	• a broad term, evolving over time • different dimensions to be considered (Commercial, Technological, Organisational) • Strategic and operational levels • Connected to e-commerce only in the past	• Heterogeneously understood from very narrow to broad depending on the client • Often connected to technology only, ignoring other dimensions as organisations & capability • Main focus on operational, less strategic purpose
Data as dominant theme	• Being able to capture, analyse, understand, use and share of internal and external data • Within organisation • Outside organisation with customers and partners	• Type 1 customers: Just another technology upgrade on existing tools as Excel or SAP in place • Type 2 customers: similar to consultant definition
Different Purposes	• Fulfilling business strategy (Strategic) • Better serve the customer (Operational) • By providing information and processes for the customer (Self-Service) and/or internal stakeholders • Digitalise touchpoints • Making better decisions • Extending existing products, services (Key differentiator) • Providing new products & services (unique selling propositions) • Shifting business models • Changing the way business works	• Type 1 customers: narrow definition of bringing existing products and service online only, e-commerce definition. Enabling Sales, Reduce service organisation load • Type 2 customers: similar to consultant definition

4.3 Benefits of Business-to-Business digitalization a Provider and User Perspective

Within the interview series numerous benefits on service digitalization were identified. In total 69 references were made to benefits that were organised around themes within Nvivo node logic (see Table 10, Appendix II & Figure 45).

Within the analysis of all the references it became clear that benefits on a provider and user side can be clustered along an efficiency and effectiveness structure (see Table 10). On a provider side, efficiency potentials, meaning 'Doing things right', were strongly connected to optimizing existing

organisational processes to make them faster, more reliable, cheaper at a higher rate of availability with the purpose of reducing the ‘serve to cost’.

Effectiveness potentials, meaning ‘doing the right things’, were mainly associated with creating new products and services with the help of digitalization, establishing a unique selling proposition with the purpose of differentiation and out of marketing strategic advantages.

However, there were other benefits mentioned on a provider’s side besides the possibility to expand a product or service with the help of technology - in other words given it some digital characteristics and with it expanding the environment in which this product or service is offered. Examples would comprise B2B online marketplaces as Alibaba or SAP Ariba (Allal-Chérif et al., 2021).

Such platforms can expand the field of operations of a company from a distribution perspective by addressing numerous potentially new buyers that are linked to them in multiple geographic areas and sectors. Other effectiveness potentials were mentioned as the creation of so called ‘relationship intelligence’ meaning that data is captured, stored, analysed, interpreted, and used to make existing interactions with customers more effective as well as to define new services.

There are several noteworthy insights from the interviews when it comes to efficiency and effectiveness benefit aspects (see Table 10).

The main part of all benefits mentioned within the interviews were made on efficiency aspects, whereas the minor part of references connect to effectiveness (see Table 10). There are several explanations for that mentioned in the interviews.

On the one hand, companies seem to look predominantly for efficiency gains first when it comes to digitalization. Reasons for that are as they are more easily understood and adapted by the organization as core processes stay the same and get optimized. In other words, as a company you keep on doing what you do but the way you do it is more efficient.

Examples would include online banking transactions, the transaction is still a transaction, but you do not need to go to a bank physically as you can conduct it online which is saving time. However, it was mentioned that digitalization can be seen as a dynamic development in some kind of maturity curve, where companies start with efficiency gains, making their first experiences with digitalisation moving on to effectiveness measures at a later stage. This is claimed to be more challenging as more aspects have to be considered in terms of investments, capabilities, and changes to the status-quo organisation and business operation model.

Another aspect that was mentioned is that companies undergo certain investments cycles meaning that there are phases where efficiency measures are more supported to cut costs. In contrast, there are phases where investment volumes are more directed towards innovation targeting effectiveness. Several consultants highlighted that it is important to have a clear understanding of the specific use case meaning what functionalities shall be realised for whom and underlying scope of how digitalization is supposed to be used. However, as simply as this might appear, companies seem to miss this clarity and end-to-end perspective.

'Typically, clients are looking for efficiency. And they are lacking the effectiveness topics. So they rather want to save money by automating processes, but they're not looking far enough on the effectiveness side of delivering better services, being more proactive on server, and so on and so forth. So, it's really not about efficiency, but it's about a differentiating point. If you do it the right way, it enables you to differentiate yourself to towards customers.'

(Consultant 1).

According to comments in the interviews this does not mean that companies necessarily move from efficiency to effectiveness activities; there were even comments that most companies remain on the efficiency side only.

From a user perspective the following points were identified when it comes to benefits of digitalization. In general, it can be stated that the references for benefits on user side were quantitatively less in comparison to benefits on

provider side. The main body of benefits on the provider side can be mirrored on the user side (see Table 10).

Efficiency potentials for users of digitalization activities comprise speed (faster), higher reliability and availability (better) with the outcome to reduce cost (cheaper) similar seen on the provider side. An additional efficiency benefit mentioned was the gained independency of sales and service resources of the providing organization, as well as the increase of user convenience when additional channels are available (see Table 10).

From an effectiveness perspective, benefits like the integration of provider-data in user organisation system for further use were mentioned. It was highlighted that there is a tendency in the market that users prefer companies offering digitalisation services, which is in line with publications in this field (see Consultant 8 quote & EMarketer, 2018).

'The B2B buyer will be ease of information gathering, ease of support for making decisions. And then also ease of, kind of using the service and consuming the service. So, the typical B2B user will, usually they tend to kind of use companies who are actually offering this, and who make it easy for him to find them and to use their services.'

(Consultant 8).

Table 10: Dyadic View on Benefits of B2B Service Digitalization Efforts

	Provider side (B2B company introducing digitalization)	**User side** (B2B company using/being affected by service digitalization)
Benefits 69 references	**EFFICIENCY:** • Lift efficiency potentials getting existing processes: faster, more reliable, cheaper, higher availability rate and therefore reduce the 'cost to serve' • Efficiency with cost reduction and economies of scale the main driver why to do digitalization **EFFECTIVENESS:** • Realising effectiveness by using digitalization as differentiation point by creating new product or service as unique selling proposition • Keeping processes up-to-date evolving with pace of technology development • Expanding your field of operation / activity environment • Being attractive as a partner, company to attract talent • Creating customer intimacy 'relationship intelligence'	**EFFICIENCY:** • Receiving service faster, more reliable at higher availability rate • Reduce dependency on availability of sales & service persons • Increase convenience in terms of cross channel/omni-channel availability of information, organization knows me, is informed etc. • Reduce costs **EFFECTIVENESS:** • Integrate data in own organisational processes • Build on receiving data for further product and service development and delivery (further downstream utilization)
	Noteworthy: • Companies seem to look for efficiency gains with digitalization first and approach effectiveness topics later in a digitalization maturity curve • Companies are undergoing different investment periods sometimes focus on cost cutting (efficiency) and others on growth with investment potential (effectiveness) • Not all companies go for effectiveness topics (More complex in terms of design, execution and providing technological as well as organisational capabilities - in other words infrastructure, processes and people resources)	**Noteworthy:** • It is about convenience of receiving a service • It can be about services where the user is the end-user but it can be also used for processes that are used further downstream within the user organization itself or their corresponding clients and/or partners
Interview Quotes	**Consultant 1:** *'Typically, clients are looking for efficiency. And they are lacking the effectiveness topics. So they rather want to save money by automating processes, but they're not looking far enough on the effectiveness side of delivering better services, being more proactive on server, and so on and so forth. So it's really not about efficiency, but it's about a differentiating point. If you do it the right way, it enables you to differentiate yourself to towards customers.'* **Consultant 2:** *'I think it's/ I think there's a maturity curve, it's about speed, and then I think as organizations mature, and they develop a better customer data platform, and they're able to curate customer data more effectively, then I think, over time, it'll also become better. They'll be able to provide not only faster service, but also better service. digital engagement. And I think there's lots of cases where that's truly true, as/ but that will change over time.'*	**Consultant 8**: 'The *B2B buyer will be ease of information gathering, ease of support for making decisions. And then also ease of, kind of using the service and consuming the service. So, the typical B2B user will, usually they tend to kind of use companies who are actually offering this, and who make it easy for him to find them and to use their services.'* **Consultant 5**: *'I think the key thing is compatibility. And the next thing is, convenience. I would call it convenience. So, everything is made much more easy for you. Also, in choosing the channels you want, like this cross-channel thing and so on, you can choose how you want to interact, at which point in time. And if they are really good in digitalization, they even reach out to you proactively. So, it is just great.'*

4.4 Costs of Business-to-Business Digitalization - a Provider and User Perspective

The following insights have been gathered on the topic of costs associated in digitalization activities on a provider as well as user side. Numerous references were made in the field of costs that are connected to digitalization activities (see Figure 46 in Appendix II). In order to structure the insights gained a matrix structure is proposed that divides cost content along a provider- as well as user perspective (see Table 11). The ‘provider’ is the company implementing a certain digitalization service having corresponding costs (provider costs perspective). The ‘user’ is a client of the providing company i.e. a firm that is using the service potentially also having costs (user cost perspective). In addition, two main thematic fields i.e. ‘Technology associated costs’ and ‘Transformation-/Change Management costs’ were identified that will serve as a sub-cluster within the matrix.

Technology associated costs comprise cost elements that have a direct link to the creation of a technological capability on which further processes and activities will be performed. Examples would include investments in hardware infrastructure like servers to provide adequate computing power, as well as necessary tooling in form of software. The latter can be seen as more operational layer running on the underlying computing infrastructure. In business administration theory these two fields are differentiated in separate cost definitions. Hardware investments are often comprised as capital expenditures (CAPEX), to buy and improve fixed physical assets like servers. Its counterpart is called operating expense or -expenditure (OPEX) which comprises more ongoing expense for running a business, product, or system (Brunekreeft & Rammerstorer, 2021). With respect to technology associated costs on a provider perspective it can be said that the interviewees highlighted that a considerable amount of CAPEX and OPEX spending is required to engage in digitalization efforts. Depending on the specific situation what is digitalized, in what way exactly, on what basis, for whom is highly variable. The main part of senior consultants interviewed said that most clients underestimate

the sum of costs that can occur. Therefore, a diligent upfront return on investment (ROI) was highlighted by several consultants to be important. Even more as this was not the standard approach within their client environment, where often so called ‘technology sunk costs’ occurred when a certain technology was chosen, implemented, and later suspended as it did not meet the requirements for the final function intended.

There are more risks and costs associated to technology besides choosing the ‘wrong’ or inadequate technology. Another cost element in digitalization endeavours can be the IT basis the company has in place. According to consultants interviewed the main part of B2B companies rely on 10- to 20-year-old, often outdated, software on which core business processes operate (see Consultant 2 quote). Bringing such so called ‘legacy systems’ up to date to fulfil nowadays business- and user experience requirements can involve some heavy architectural lifting on the organisation IT landscape that is cost as well as time consuming.

‘There's a lot of technology debt out there. A lot of companies that have invested in trying to do these things, and it hasn't been effective, or it hasn't succeeded. And so it's very much worth doing the ROI analysis on these things, to make sure that whatever costs that are being considered, will be offset by the gains.’

(Consultant 2).

Even when having established a more up to date environment several other pitfalls were mentioned. Examples include the misuse and mismanagement of infrastructure. This would be the case when new cloud-based tools and systems are in place but managed in similar ways as old IT legacy systems. This is problematic as virtualised cloud computing environments underly other technical specifications and logics; consequently demanding other maintenance management as on on-premises legacy servers. Another example would be that all detailed characteristics of a legacy systems are copied to a modern cloud environment without making any changes like simplifications and standardizations. Such bespoke adaptations contrast with cloud design principles that rely on standardized, less complex structures in order to fully

realising their potential such as computing power and real-time updates. With respect to technology associated costs on a user perspective the following can be stated (see Table 11). CAPEX and OPEX costs, as mentioned above, can occur depending on the individual situation; however, in most of the cases it is just a fraction of the investment on a user side than on a provider side. Possible investment might include changes in supply chain management (SCM) set ups when new processes are included (CAPEX) but it could be as well that certain license fees for software tools are required (OPEX). The field of 'Transformation- & Change Management costs' build on the non-material elements that are included when it comes to necessary investments in digitalization. One sub-cluster of costs identified in the interviews were costs associated with the organisation especially 'people' working in the organisation (see Table 11). Several consultants mentioned that it is not just enough to have the right staff, with the right capabilities in place to design, implement, use, support, and improve digitalization activities which already includes additional costs. In addition, it was mentioned that investments in change management programs are necessary as digitalization changes the 'way of working' of an organisation, meaning how things are done in a company. Such changes might cause employee demotivation up to resistance managing against intended digitalization activities.

'…you need to make sure you're continuously investing into it, into kind of the digitalization space making sure that people come along on the journey.'

(Consultant 8).

It was mentioned that 'Transformation- & Change Management costs' are not limited to the providing organisation that implements a digitalization service. It was highlighted at several times that change measures as educating people also applies to the receiving organisation i.e. the 'user organisation', where people need to be trained too in order to understand, use and benefit from the new established processes. There are other topics that seem relevant on the provider- and user organisation's side such as educational-, cyber security-, and data privacy aspects. The latter was highlighted as with more digitalization activities in place, in which high volumes of information is generated, analysed,

and send by digital channels, the risk increases that such information leaks outside intended processes being subject to potential fraud if security levels are not met. Besides the mentioned cost elements above ‘opportunity costs’ were highlighted during the interviews. In business administration theory opportunity costs comprise the loss of a certain benefit that possibly could have realised if the best possible alternative was chosen instead (Loux et al., 2020). With respect to opportunity cost one interesting insight was generated. Some consultants claimed that there are companies that do not or only partly engage into digitalization endeavours if they associate too high opportunity costs with it. Besides the financial investments necessary, that might be not available or invested with a higher intended ROI in other fields, it was also mentioned that companies having less competitive products object to put these in a digital sphere (see Consultant 5 quote). The argumentation behind this would be that they would become more transparent to stakeholders in the marketplace as partners, competitors, and clients. This transparency would show the ‘outside world’ possible weaknesses of the services and/or products when being compared with other competitor propositions. Such companies would use digitalization maybe for internal processes, to lift efficiency potentials, but not towards the external environment.

‘Well, we said you are putting things out in the open, and it makes it much harder to hide that maybe you do have a lousy customer service organization.’

(Consultant 5).

As a summary from the interviews it can be stated that costs within a B2B digitalization context is a complex construct consisting of different layers. Besides a technological enablement layer requiring investments in terms of infrastructure, processes, and software there are other fields of costs to be considered. Such fields touch transformation-, change management-, as well as opportunity costs. All these make digitalization endeavours in B2B a challenging environment to navigate. Consequently, it is important to understand, and scope feasible digital functionalities that are adequate to the organisation requirements and its clients, judging the necessary material and immaterial investment to realise them.

Service digitalization	Provider Side (B2B company introducing digitalization)		User Side (B2B company using/being affected by service digitalization)
Costs 104 references	**TECHNOLOGY ASSOCIATED COSTS:** • Capital Investment (CAPEX) – IT infrastructure and processes • Operating Expenses (OPEX) – staff, license fees for applications • Technology sunk costs due to poor ROI analysis • Technology debt because of IT legacy (heavy architectural generating) • Cost of technology mismanagement - in other words treating new tech in old tech logic Usually, high investment associated with introducing digitalization		**TECHNOLOGY ASSOCIATED COSTS:** • Capital Investment (CAPEX) – infrastructure and processes as SCM adaptations • Operating Expenses (OPEX) – staff, license fees for applications Investments can occur but in most cases much less than on provider side
	ADOPTION- / TRANSFORMATION- / CHANGE MANAGEMENT ASSOCIATED COSTS:		**ADOPTION- / TRANSFORMATION- / CHANGE MANAGEMENT ASSOCIATED COSTS:**
	People & Organisation costs: • Training costs of staff • Cost of resistance of staff (demotivation etc.) • Cost of resistance of customers based on 'forced' digitalization Opportunity costs: • Stay on old set-up • Cannibalization of recurring services • Cost of switching business model from perpetual upfront full contract payment model to pay per use one monthly basis • Cyber security data privacy risks	Project Management associated Costs: • Cost having wrong or only partial scope • Cost of poor execution • Costs of failure • Cost of learning • Cost of choosing inadequate technology • Cost of choosing wrong supplier (Start-Up going bankrupt)	People & Organisation associated Costs: • Training costs of client organisation not just users • Risk of losing trust as personal service is substituted with digital one Opportunity Costs: • Cost of inefficiencies – new solution not having the same value • Cost of forced digitalization • Risk of receiving less value • Risk of losing trust • Risk of data privacy, cybersecurity
Interview Quotes 1	*Consultant 2: 'There's a lot of technology debt out there. A lot of companies that have invested in trying to do these things, and it hasn't been effective, or it hasn't succeeded. And so it's very much worth doing the ROI analysis on these things…* *Consultant 4: 'I had not only one client, they had a digitization program and their first bullet point was S4-Hana, Google Data, CDP - customer data platform by google and by implementing all this we could play the digital field not touching the organization, not touching processes, not touching business model and this will end up in a financial fiasco.'*		*Consultant 4: It is an overlap it is not to do the internal organisation first and then do the clients. For me it is an overlap because you need to have your organisation to educate your clients. What we successfully did is to bring two to three clients in the project not from the first idea but from an early stage to develop the common benefits and digitisation in a way that they are familiar with that they are alike therefore that they are committed to it and see the benefits better when they are involved.'*
Interview Quotes 2	*Consultant 1: 'You have this change aspect. So, if you don't go this journey with your people, they will not fully apply the digital service offered to them. They will resist, and they will still go/ get along. So, you do have inefficiencies in your process. They still will call their guys, and still follow the old path and the old processes.'* *Consultant 2: 'If I only offer digitalization as my solution, and then I might turn customers off, I might turn them away, because they're not getting to/ it's not effective. It's not getting to the answer that they need quickly. So, again, I think it has to be looked at case by case.*		
	• Differs per use case, segmentation of use cases underlying customers is important • E2E Change strategies necessary – Use case definition, ROI analysis, technology selection, supplier/vendor selection, execution, adaptation etc. • For clients is not just benefits and cost but trade-offs there might be cost associated with new service, but benefits might be much higher – so it is a value discussion		

Table 11: Dyadic View on Costs and Risks of B2B Service Digitalization Efforts

4.5 Influence Factors of Business-to-Business Digitalization

An important aspect in the interview series was to identify possible factors that directly or indirectly influence the decision of companies to engage into digitalization activities.

Based on the interviews conducted 345 references to influencing factors of digitalization were identified (see Table 12 & Figure 46 in Appendix II).

On an organisational internal perspective several sub-categories were highlighted influencing digitalization endeavours.

‘Organisational capability’ was mentioned, which comprises the ability of an organisation to provide the necessary elements to fulfil a certain purpose in this case digitalization activities. Elements of organisational capability in this context are people capability and motivation of staff i.e. skills necessary for designing, implementing, and developing technical solutions in the field of digitalization. In addition, the existence of incentives and an environment that fosters digitalization, as it can sometimes be seen as a threat of changes in established ways of working and connected reduction or replacement of staff, was highlighted. Consequently, a company needs to decide on the basis of an actual use case, meaning a technical function or new activity it wants to realise, if it does have the right people capability at hand or if it is able to recruit and/or develop these and at what costs. ‘Product and service portfolio’ of a company was also mentioned as an important influencing factor as in most digitalization it is the ultimate objective to offer products and services in a digital format. Depending on the product characteristics and its technical or commercial complexity (specifications, pricing, modularization) digitalization efforts differ. ‘Senior Management engagement’ was another element that mentioned as critical in digitalization endeavours as digitalization is in the main part of cases such a big change to the existing organization that top-down support in terms of securing investments, supporting change procedures are implemented. However, this senior management support needs to be complemented by a

general vision of what digitalization really means for the specific organisation and the underlying use cases to facilitate change and direct all internal cross-functional resources towards one common objective. To complement internal factors several external factors to an organisation were identified that could influence the digitalization activities (see Table 12). ‘Consumerization’ of B2B was mentioned as one main term meaning that development in B2C influence demands in B2B as B2B actors are consumers in their private life experiencing digitalization developments that are further advance than in the standard B2B environment. In this sense B2B actors see in B2C what is possible and demand the same or similar in their B2B environment.

The COVID-19 pandemic was also mentioned at different occasions in the interviews as it is seen as some kind of catalyst of digitalization as with physical restrictions the need for more digitalised solutions became almost indispensable forcing B2B companies to speed up on their digitalization agenda. One of the main themes of external influencing factors were ‘customer types’. As different customers with different characteristics exist, digitalization efforts need to consider these characteristic when scoping, designing, and implementing digitalization activities. One element that influences these characteristics additionally could be as well the specific industry, as each industry sector has underlying logics of how business is conducted as well as established standards. In this respect software industry interacts in a different manner and has other logics of engagement than for example the manufacturing industry, which has strong focus on supply chain interdependencies, or the financial industry having to consider regulations as BASEL III (Roulet, 2018). ‘New competitors’ from within as well from outside the industry were mentioned as other influencing factors forcing companies to engage in digitalization efforts as these new players offer more convenient services with the help of digitalization as established industry players. One element overlapping internal and external factors was the ‘relationship type’. Besides possible segmentation along product, service portfolio, or customers it was mentioned that the type of relationship between providing and using organisation could be an additional influencing as well as segmentation criteria when deciding on digitalization efforts.

Table 12: Internal and External Influence Factors of Business-to-Business Digitalization

Internal Factors	External Factors
• **Organisational Capability** – having all capabilities at hand for digitalization → People capability & motivation → Processes capability → Technology capability • **Product & Service Portfolio** – to what extent is the portfolio digitalization ready • **Senior Management Engagement** – to what extent is it a strategic endeavour, what is the support for change • **Organisational Vision & Collaboration** – is there or what is the overarching vision and collaboration	• **Consumerization of B2B** - Changing Buyers Behaviour and demands • **COVID-19 Pandemic** – increased need for digital solutions • **Types of Customers** – different customer segments having unique demands • **Industry** – different industries have different logics, principles, circumstances • **New competitors** – possibility of industry internal and external entrants • **Supplier & Partner value chain** – E2E process view not limiting to internal organisational value chain
• **Relationship** – internal and external factors in form of relationships as additional segmentation criteria	

4.6 Challenges in Business-to-Business Digitalization – a View from Practice and Academia

A central part of interview series was to identify possible knowledge gaps and challenges in practice to realise benefits of digitalization as outlined in section 4.3. A series of knowledge gaps and challenges from a practioneers perspective were identified and structured along the theme categories summarized in Table 13 along six clusters: People, Change Management, Vision, Business Model, Data & Technology, and Financials (see Appendix II, Figure 46).

These clusters were identified based on various references made by the interviewees (see Table 13). A cluster was qualified as challenge when more than 20 references were stated by the majority of all interviewees (see Appendix II, Figure 46). After presenting the findings from practice in detail they will be reviewed in the light of corresponding contributions from academic research.

Table 13: Challenges in Business-to-Business Digitalization – a Practioneers Perspective

#	Category	Challenges in B2B Service Digitalization	Quote Extract	Number of Interview References (see Figure 46. App II.)
01.	**Vision**	• **Missing alignment between business- & IT strategy as well as overarching vision towards digitalization** – it is not technology alone but aspect along the whole organisational value chain as people and processes. • **Moving from narrow definition of digitalization to holistic overarching theme for the organisation** – digitalization often limited to certain parts of organisation missing the aspect of interdependency.	*Consultant 4* *Consultant 6*	*22*
02.	**Business Model**	• **Understanding potentials & changes of existing business model in place due to digitalization** – to what extent can current business model digitally enhanced what are changes.	*Consultant 4* *Consultant 7a* *Consultant 7b*	*33*
03.	**People**	• **Digitalization is not an IT only discipline** – bridge and close the gap between information technology departments and other business functions. • **Having the necessary capability available** - digitalization might demand new capabilities. Huge digital talent demand on the market.	*Consultant 2*	*52*
04.	**Data & Technology**	• **Embracing data as basis for digitalization** – most organisations not data-ready to lift full digitalization potentials. • **Understanding of technological development as AI & machine learning** – many organisations do not understand the terms and what they mean and how they can be applied.	*Consultant 3* *Consultant 3*	*38*
05.	**Change Mgmt.**	• **Underestimation of digitalization complexity** – it is not just bringing your existing processes and products online. • **Focussing on human experience on provider and user side** – incentivise using digital tooling and its potential. • **Internal change can lead to external change as customers are affected**	*Consultant 8* *Consultant 2*	*30*
06.	**Financial Aspects**	• **Securing investment budgets long-term** – depending on digitalization efforts, investment strategy has to be longer term. • **Change in revenue generation models** – from upfront one-off high volume to recurrent low volume models	*Consultant 2* *Consultant 3* *Consultant 8*	*21*

4.6.1 Vision

Giving the organization a common vision, directing organizational functions towards it by connecting all the necessary elements, as well as considering cultural aspects was a common theme mentioned in the interviews when it comes to challenges in digitalization.

'Some still see it as just/ that the technology, some people see it as a combination of the business model. And some of the, I'd say, the thought leaders are starting to understand that it's about the operating model and the culture.'

(Consultant 6).

To address these challenges of a common organisational vision, literature proposes several paths. Haffke and Benlian (2016) propose that organizational leaders have the duty to ensure that the organization develops an overarching mindset towards digitalization - in other words a 'digital vision'. To create an overarching mindset, it is critical to have the buy-in from senior leaders within key organizational decision areas (Chahal et Rani, 2017; Ismail et al., 2017). Such senior leaders would be expected to articulate a common vision to their part of the organization as well as to prepare an activity roadmap for future commitments (Fitzgerald et al., 2014). Using senior management in a top-down change management process is a commonly accepted approach that has been identified and suggested in multiple studies (Berman, 2012; Foss & Saebi, 2017; Kane et al., 2015). However, there is not yet a clear answer to as how much c-suite positions should be in charge of the digital transformation strategy (Matt et al., 2015).

In this context, besides building on established c-suite roles as Chief Executive Officer (CEO), and Chief Information Officer (CIO), the creation of specific roles are discussed as the implementation of Chief Digital Officer (CDO). The CDO should ensure that digitalization is an overarching organisational endeavour touching several fields of an organization, that digital activities are aligned with organizational strategy, that they are properly leveraged and that close collaboration between IT and business functions is fostered (Horlach et al.,

2016; Singh & Hess, 2017). However, up to today very little is known how with regard to the actual work of CDOs and there seems to be companies that succeed in digitalization without having such dedicated roles (Vial, 2019).

To complement visionary elements driven by inclusion of senior leadership roles literature proposes also more structural decision mechanism within an internal governance to execute the vision as a vision remains a vision when it gets not operationalised (Ismail et al., 2017). Companies face multiple structural choices to operationalise their digitalization vision whether digital operations are integrated in existing structures or as separated units as discussed in Section 4.6.2 (Guest, 2014; Hess et al., 2016; Valdez-de-Leon, 2016). A widely accepted structural mechanism to secure digital transformation is to establish a strong organizational-wide coordination mechanism through collaboration and communication of task and rules along with adequate key performance indicators (KPI) ensuring that the organisation is on the track to transformation (Von Leipzig et al., 2017; Westerman et al., 2011). If this organization wide and overarching alignment from senior leadership roles in combination with structural change management mechanism is set aside the risk persists that vision is not fully executed and only partial implemented within functional silos as outlined in the following interview quote. An example would be that digital activities are initiated in on functional sphere, as the sales department with the introduction of a CRM-System that combines existing data as well as providing new ones. If such tools and data are not shared with another functional area, as for example the service department, certain potential get not lifted.

‘So, I think the term I use, what a lot of organizations are doing is what I call accessorization. If you think about your house, you buy accessories in the house, right? That is just accessorizing the business with new technologies and new ideas, accessorization.’

(Consultant 4).

Within organizational change literature the existing of certain capability or knowledge silos within organizations are discussed. Such silos are organizational units that are highly specialised in a functional area but unable and sometimes unwilling to share information effectively and/or perform other

tasks what it is good at (Kuusisto, 2017; O'Reilly et al., 2012). In this respect, due to their highly specialisation they might consider only certain aspects of more overarching digitalization endeavours or pursuing digitalization activities approach within in their unit only as some kind of 'digital nucleus' keeping data, information and insights enclosed. Contemporary organizations however seem to have a believe that information sharing on a broader scale is key to success (Kuusisto, 2017).

4.6.2 Business Model

The influence of digital endeavours on a firms' business model has been highlighted in the interview series conducted from different angles. One perspective was by how much digitalization can increase the value of existing business (see section 4.3 on 'Doing things right'). Another perspective was on how existing business models can be extended by new products and/or service enabled by digital technology (see Section 2.6.2).

'For me digitalization is a driver to increase business and to extend current business models.'

(Consultant 4).

Taking an academic stance, the definition of the term 'business model' has been subject to wide academic debates ranging from dictionary views as by Oxford (2017) that define business model as:

'… a plan for the successful operation of a business.'

to philosophical visions such as by Peter Drucker that states that business model gives:

'… answer to the most important questions: who is the customer and what does the customer value.'

(Kotarba, 2017).

The academic debate goes as far that certain scholars openly admit how surprised they are that no universal accepted definition exists and others on the

contrary question the necessity of an accepted definition (Weill et al., 2011, Jensen, 2013).

'While the term 'business model' has gained widespread use in the practice community, the academic literature on this topic is fragmented and confounded by inconsistent definitions and construct boundaries.'

(George & Bock, 2011; p. 83).

For this research project we take over the definition of Schallmo et al. (2017) that state:

'A business model is the basic logic of a company that describes what benefits are provided to customers and partners. A business model answers the question of how the provided benefits flow back into the company in the form of revenue. The created value enables a differentiation from competitors, the consolidation of customer relationships, and the achievement of a competitive advantage.'

(Schallmo et al., 2017; p. 6).

From an academic perspective the fact that digital technologies can bring disruption to entire markets, where firms operate within established business models, changing entirely how products and services are created, offered, consumed, up to replacing them entirely, is not new (Lilien, 2016; Mithas et al., 2013). In more detail, it is long known that digital technology can facilitate the combination of services and products to create new forms of entirely digital or digital enabled offerings (Yoo et al., 2010). In addition, digital technologies can add digital services to material products (Barrett et al., 2015; Lanzolla et al., 2021). With it, digital technologies can lower market entry barriers tremendously (Woodard et al., 2012) and therefore challenge the competitive advantage of traditional organizations often called 'incumbent' in the market (Kahre et al., 2017; Kammerlander et al., 2018). Examples are plentiful as the music industry, where physical goods such as DvD's and CD's, that were distributed by physical on-premises intermediary stores, have been almost entirely supplanted by music and entertainment subscriptions services by organizations that formerly where not part of the industry. Examples would be Apple, with their

platform-based music service iTunes, or Spotify, another international music and entertainment organization, building 100% on digital product offerings (Vial, 2019).

In the light of such digital disruption firms in all markets have to devise ways to remain competitive and digital technologies have the potential both to be:

'…game changing opportunities for – and existential threats to – companies...'

(Sebastian et al., 2020; p. 197).

Even with a large body of literature that treats digital transformation as an endogenous phenomenon, where digital activities are created to respond to opportunities with the help of digital technologies (Tan et al., 2015), there are other sources where digital transformation is regarded as a threat. Such threats would impact organizations that are not aware of ongoing changes and their possible impacts (see Consultant 7 quote), going as far that there are organization that deliberatively resist to engage in digitalization (Sia et al., 2016 & Section 4.6.5 on '*inertia*').

'On the innovation side I would say organizations, first of all, don't put enough energy into understanding what's happening around them.'

(Consultant 7).

Even with the generic concept of business model strategy explaining responses to such disruptive effects (Yoo et al., 2010) the literature highlights two new concepts with regard to digital transformation and business model theory e.g. 'digital transformation-' and 'digital business strategy' (Vial, 2019). Bharadwaj et al. (2013) found out that competition among organizations increasingly goes along with their ability to use digital technologies to realise their vision proposing a definition for 'digital business strategy' that is:

'… Organizational strategy formulated and executed by leveraging digital resources to create differential value.'

(Bharadwaj et. al., 2013; p. 472).

In contrast, Matt et al. (2015) propose the concept of ‘digital transformation strategy’ as the:

‘… *focus on the transformation of products, processes, and organizational aspects owing to new technologies*’.

(Matt et al., 2015; p. 339).

In this respect Matt et al. (2015) argue that in contrary to digital business strategy, that focusses on potential future states, digital transformation strategy is more a blueprint that can be seen as a support that governs the transformation activities, where structural changes must be carefully planned.

As a summary it can be said that the influence of digital transformation on business models is accepted in the literature (Kotarba, 2017; Matt et al., 2015; Sia et al., 2016; Vial, 2019). However, there are different concepts discussed in the literature how exactly digital transformation is impacting business models and no general accepted model has been delivered. However, even with no general framework existing so far Li et al. (2018) suggests, based on insights from 50 case studies analysis, that the influence of digitalization on business models falls in three main thematic fields e.g., ‘automation and digital enhancement’, ‘digital extension of existing traditional business models’ and ‘digital transformation of business models’ (see Figure 26).

‘Automation and digital enhancement’ comprise the use of digital technologies to automate rather to transform existing business models. Examples would be new communication channels with stakeholders and customers as via websites which are maintained either via 3rd party providers or internally. In this respect, digitalization in form of digital technologies is used to enhance existing business models for example by providing information within a digital format to facilitate customer communication which is similar to the efficiency gains of digitalization and the respective ‘Doing things right’ discussion.

Within the field of ‘Digital extension of existing business model’ companies would combine digital elements with traditional business activities to increase impacts and reach of their products and with int generating additional revenues although their business model is retained for the main part (Li et al., 2020).

The ‘digital transformation of business models’ includes significant transformation of the business model meaning that severe changes on different levels occur as what is offered as a product and how, how revenues are generated, and the necessary infrastructure has to be adapted up to newly created to support this change.

There is no indication in the literature found on what ‘significant change’ would really mean. The following example from the software industry shall illustrate the outlined dimension.

Historically, software firm’s X business model was to provide customized software to large clients. This bespoke software (product) was individually developed and implemented (process & infrastructure) up to clients detailed demand enabling the software provider to take premium prices often in one-off payments including patent rights (revenue streams). A business opportunity allowed the software firm to buy back the patent for a large project management software that was formerly individualised to this client only. With help of digital technologies, the software firm was able to standardise this software in a way that it would fit multiple clients over a platform approach. This was a tremendous change in the business model of the software firm on different dimensions from serving single large clients at first hand to serving multiple clients (Client Dimension), from individualised products to standardised ones with additional services (Product Dimension). An additional change was that the generation of formerly large one-off revenues was replaced by more recurrent income streams increasing financial resilience (Finance Dimension).

All this was only made possible by an infrastructure architecture that was formerly bespoke focussed and now more mass market oriented (Infrastructure & Process Dimension).



Figure 26: Impact of Digitalization on Business Models, Based on Li (2020).

4.6.3 People

A major theme mentioned within the expert interviews was connected to ‘People’. People in this context can be defined as a multi-layer construct. On the one hand, the necessity of interconnectedness of functions meaning that digital transformation is not an ‘IT-only’ or other function only discipline. On the other hand, the challenge of having, attracting, and developing the necessary digital capability of the workforce within an organisation to fulfil the digitalization endeavours.

‘I think there's definitely still a large gap between people in technology, in IT, … and there's a need to bring harmony between those two organizations in order to serve the customer better.’

(Consultant 2).

Many studies in academia have highlighted the need for adequate intra-organisational capability to lift potentials in technology adoption such as having IT architects and programmers at hand (Ramaseshan et al., 2015; Sila, 2015). Others highlight the importance of workforce management as the recruitment of necessary IT skills or their internal development with the help of trainings and other formats to achieve a certain upskilling effect (Fu et al., 2011; Gökalp & Martinez, 2021). However, there are only a few more recent sources address the interconnectedness of disciplines outside the IT-space. Eggers et al. (2017) highlight that in addition to having necessary digital resources at hand, in order to achieve an end-to-end digital transformation a key topic is to consider organizational changes. According to them this is especially important with regard to linkages between business units, as the creation of more flexible structures, to address the dynamic nature of digital change. Verhoef et al. (2021) identified the need for ‘digital functional’ areas that must go far beyond a focus on IT department only upskilling. They point out that most companies oversee the importance to establish digital skills in service operations and other functions to enhance value creation. According to the analysis of Verhoef et al. (2021) this does not only mean to upskill multiple departments and existing

resources but also to attract employees with analytical and digital skills possibly replacing an existing workforce.

Attracting digital talents is seen as one major challenge for incumbents as talented analytical and digital profiles tend to prefer companies as tech-giants like Apple, Google, or start-ups in comparison to traditional companies (Deloitte, 2015; Dorasamy, 2021). To address this challenge organizations have adopted more ‘agile organizational’ forms, with less hierarchical organizational schemes and traditional top-down management approaches, implementing more flexible self-managing units. The intention was to be more attractive for younger talents, as well as establishing an environment that can better deal with dynamic changes in the digital environment (McGrath, 2010; Robertson, 2015). This approach goes as far that own organizational structures as own business units or companies, so called ‘digital hubs’, are created. The intention is to establish agile environments allowing quick learning and experimentation, separate from the original organisations where digital changes as such are potentially seen as possible threat as they might replace existing services and process and with it replacing the existing workforce (Broekhuizen et al., 2018; Farivar & Richardson, 2021; Venkatraman, 2017). According to the information retrieved from the interviews and subsequent literature review presented the role of ‘people’ within digital endeavours can be seen as a multi-layer construct. As a first layer the necessary skills in order to design, implement as well as operate digital tools and processes seem necessary ‘functional digital skills’. Such skills are not bound to certain departments - in other words organisational functions only as digitalization can be regarded as an overarching phenomenon depending on the underlying specific digital endeavour. However, the level of digital skills and the specific combination of skills may vary having specific demands. Skills will vary in IT departments, where digital tool and processes are built and programming skills are necessary, in comparison to functions using such tools and processes. Function would include service- or sales personnel that will not need programming skills but more operational skills using the IT. A comparable example would be an automotive engineer and a car driver - the engineer needs sophisticated technical skills to design and build the car, the car driver just needs to know how to operate it.

4.6.4 Technology and Data

Another topic that was highlighted within the interviews was the availability and management of data and corresponding technological- as well as IT skill capability, themes that has been also highlighted in the digitalization literature.

It has been widely accepted in the literature that ‘data’ is fundamental building block for digitalization often referred to as the ‘new oil’ due to the possible impact it can have to create additional business value and with-it enterprise growth (Sun et al., 2020). In this respect, data has become an important input element for companies to tackle fierce competition in competitive market environment to stay competitive (Low et al., 2011).

To use data as a possible source of competitive advantage by gaining profitable insights, firms have long started to adopt state of the art information technologies to enable them to collect, store, analyse and transform data (Sun et al., 2020). But what is exactly meant with ‘data’? Many articles around data in business context have highlighted the importance of data, their impact on business model as an innovative resource but it is rare that the term ‘data’ is qualified within the context of digitalization.

Hull et al. (2013) propose a four-class typology for data management within enterprise database system. The first class is business data that is crucial for a business process logic to be fulfilled such as a shipping address to which a product is delivered. The second class would include the status of the business process for example reporting the status if a shipment has been made or not which would include conceptual input data (important for a performer/user or system) and implementation specific data (data storage, data base operations). The subsequent third class would capture the status and possible resource usage within a certain business process one example would be if storage space is reserved in cargo ship next evening. The fourth, a final class, describes correlations between possible related business process instances that are involved in the execution i.e. an overarching business process instance that spawns several fulfilment businesses processes. However, how data is defined, processed, and utilised seems to be highly individualised to the underlying used

case and there seems to be no standard classification schemes even as data sources vary tremendously coming from physical- as well as digital realm.

With the potential of information technologies within the last decades the digitalization of physical often passive infrastructure as machines and buildings has been highlighted in the literature under the terms machine-to-machine communication and internet if things (Vaidya et al., 2018; Zheng et al., 2021).

There are calculations that by the year 2020 more than 50 billion machines/devices were connected, being one major origin of digital data volume increase and tremendous pool of data available (Saqlain, 2019). In addition, besides data from formerly passive devices there is more and more data available that comes from the digital realm. With an increasing number of people in the B2B and B2C environment using digital connected devices, data connected to user activities resulting in buying behaviour predictions are generated in exorbitant volumes (Cortez & Johnson, 2017). But there is more than just data that was based on indirect activities with B2B platforms like linkedin.com, where professionals publish their job profile posting and consuming business content, are just other examples out of many more that could be named which increase the availability of data even more (Cappa et al., 2021; Sumbaly et al., 2013). In response to the high demand to collect and exploit numerous types of data stored in vast repositories that are accumulating higher and higher volumes of data at a more and more increasing rate, the concept of ‘big data’ has evolved (George et al., 2014). ‘Big data’ can be characterized by veracity, velocity, variety, and exponential volume and has developed from being a fashionable trend reserved for large corporate companies to become business critical for companies of all sizes (Goes, 2014; Sun et al., 2020). However, even with ‘big data’ being around for some time there are several indications in the literature that most industries and companies within are still at an early stage of adoption due to the complexity of topic and necessary capability and fundamental pre-requisites necessary (Inamdar et al., 2020; Klie, 2013).

In this respect, the capability to create and analyse big data for proposition building as well as decision making is accepted to be crucial, given that digital technology functionalities rely on digital data as input source (Dremel et al., 2017).

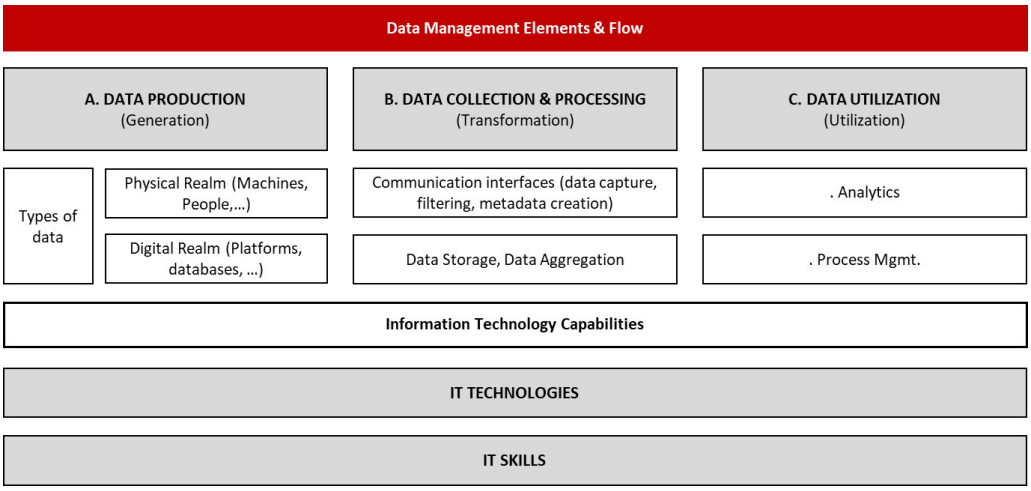


Figure 27: Data and Technology Framework

Despite the extensive availability of data and the ease to collect it, firms seem to struggle heavily when it comes to analyse and utilise them (see Consultant 3 Quote).

'I would say that companies typically have a lot of data, and they struggle to make sense of that data. … So, you know I think one is making sense of the data, and the second one is operationalizing against that data. And companies really struggle with that.'

(Consultant 3).

Within a consulting survey based on 6.381 IT business and IT executives in 2018, 79% responded that their business strategies and most critical systems heavily rely on data, but they have not invested tremendously in verifying the reliability of their data sets (Accenture, 2018). In addition, besides data availability and their reliability, literature highlights the importance of the corresponding technical as well as personal capability in form of employees having strong analytical as well as digital skills and that this is not the standard for many organizations engaging in digitalization (Verhoef et al., 2021). However, to generate data, transforming it in relevant information that can be

operationalised in business to create value a high degree of data quality must be achieved and is a key prerequisite.

‘You really need to have good quality data in order to digitalize and drive insights for us from a service perspective.’

*(*Consultant 3).

To achieve necessary pre-requisites to lift business value from data technology readiness for data management has been highlighted in the literature (Low et al., 2011). The technological readiness of a company, meaning, technical infrastructure for data gathering and processing, human resource IT capabilities that can technically manage but also translate data in business insights heavily influences the adoption of new technologies (Oliveira & Martins, 2011; Ramaseshan et al., 2015). In detail that means that data is transformed into information that is used in value creating activities. Consequently, to do so different technological layers of managing data as well as the corresponding IT- and digital skills throughout all necessary functions are essential (see Figure 27).

4.6.5 Change Management

Another challenge theme identified within the expert interviews, also discussed in academia, is the complex nature of digitalization efforts and how organizations address them within change management activities (Jöhnk et al., 2020; Lilien, 2016).

‘Business leaders often tend to underestimate the complexity from a technology standpoint. So, they might think, ‘Well, it should be easy to just enable the customer to self-serve, make that happen in IT’. So, in my experience, the biggest challenge is, you tend to have people on the line of business side that underestimate the degree of complexity in creating effective digitalization capabilities.’

*(*Consultant 2).

It is accepted in main body of literature that IT takes an engaging role to enable organizations to cope with the continuous change of emergent digital technologies and innovation (Vial, 2019). However, to fulfil this purpose, it is accepted that IT cannot engage in isolation as complex and business function overarching impact of digitalization requires the alignment of business- and IT strategy in a structured change management approach (Verhoef et al., 2021). What sound feasible in theory seem to be challenging in practice as several studies have highlighted. Academia has identified several tensions that might occur as a growing cultural divide between business and IT functions, competition for limited resources within and organization with the result that hinder originally intended change management endeavours and therefore the interplay of organizational functions (Jöhnk et al., 2020). Besides implementing overarching structures when it comes to digital endeavours there are other hindering elements identified in the literature that can occur. Organizational functions being confronted with digital transformation activities can have several perspectives on them both positive and negative. It can be seen as positive meaning that digitalization is understood as a help on the one side making established structures for example more efficient (see Section 4.2). On the other side, digitalization can be seen more critical up to resistance as it might changes the status-quo to a level that change is seen as threat (Oliviera & Roth, 2012). ‘Inertia’ has been identified as one major theme hindering digitalization efforts (Vial, 2019). Inertia becomes relevant when existing capabilities and resources within an organization may act as a barrier to new ideas as innovative approaches and disruption (Gruia et al., 2020; Islam et al., 2017; Wenzel et al., 2015). One example for inertia would be incumbent firms that are deeply embedded in tight supplier and customer relationships having highly optimized, still complex, and often rigid processes that rely on specialized resources that are hard to be reconfigured (Andriole, 2017; Widjaja & Gregory, 2020; Woodard et al., 2013). In such environments it is harder to create, foster and implement digitalization activities and higher change management efforts can be a possible result. However, the reconfiguration of specialized resources seems to be not bound to technology only. There is mutual understanding that technology is an important element, however there are other factors like the

‘people’ behind the technology as discussed in section 4.6.3 including the interconnectedness of different functions. In addition, there are indications that there are aspects of organisational culture needs to be considered.

‘…a lot of B2B companies and B2C are still seeing it as more of a technology driven roadmap than as a cultural change to how they work. Because there will always be another technology.’

(Consultant 8).

Organisational culture has been addressed in information system research to explain how changes in IT and environment as digitization, digitalization and digital transformation are affected by culture and how this could be managed (Shin et al., 2021; Zammuto et al., 2007). Companies having undertaken large digital transformations with initially high expectation on organisational and customer benefits have failed because they collided with the existing company culture (Wokurka et al., 2017). Hence, digital endeavours require implementing a digital culture that supports that change (Martinez-Caro et al. 2020). Even with some firms being aware of the importance of a digital culture, research in this area is rather scarce (Haffke et al., 2016). One of the few recent examples is a quantitative research project by Martinez-Caro et al. (2020) that showed that companies that incorporate a digital culture can expect higher performance. However, to lift such performance measures the shift from traditional to digital culture requires not only technological and business process requirements but also the combination of other contextual enablers as window of opportunity (timing of activities) and education as upskilling of IT and other functions (Martinez-Caro et al., 2020).To summarize change management aspects in digitalization endeavours also seem to be multi-faceted. On the one hand, change management in digitalization has a technological level as new technologies are introduced complementing or replacing existing technology stakes. This change cannot be seen in isolation as this may lead to processual changes meaning how things are done moreover new things must be done. Connected to this processual level might be several functions from IT, Sales, Service, and other organizational functions affected having the potential of certain tensions as the example of ‘inertia’.

4.6.6 Financial Aspects

As part of the themes highlighted within the expert interviews financial aspects were a recurrent topic in conjunction with digitalization. Financial aspects were stated from perspectives as from investment perspective meaning that enough financial resources have to be available to fund digitalization activities, from a financial potential- and return on investment (ROI) perspective meaning what return can be expected from initial aspects depending on what as well as on an income logic perspective as digital transformation and it changes to a firms' business model could change the logic how revenue streams are generated.

'… a lot of companies, all the companies actually have hidden what I would call technical debts. You can't find this on your balance sheets.'

(Consultant 8).

Regarding 'Return on Investment' (ROI) in general it can be stated that digitalization is accepted to have a profound effect on firms down and upstream operations, networks, ecosystems, and finance operations (Cao et al., 2021; Iansiti & Lakhani, 2014; Jacobides et al., 2018; Porter & Heppelmann, 2015). However, many companies are continuously investing in different digitalization activities as data warehouse, business analytics and various attempts of data visualization to realise business insights and with generating value with very limited evidence so far of actual profit gains (Gebauer et al., 2020; Talaoui, 2018). While there is a common understanding in the literature that digitalization-related capabilities have a deep impact on firms and organization with many positive effects of such digitalization activities seem to be self-evident, the very nature and underlying effects remain unclear so far and concerns about the productivity of such investments have been raised in several articles (Brynjolfsson, 1993; Brynjolfsson & McAfee, 2012; Kotarba, 2017). The current evidence reveals that many companies face considerable challenges in value appropriation from initially taken investments in the digital space (Kohtamäki et al., 2020). Even with companies collecting and managing vast amounts of internal and external data quite often they seem to lack the necessary technological- and IT skill capabilities to really utilise as well as

capitalise the data (Ehret & Wirtz, 2017; Hasselblatt et al., 2018). All too often, investments on a broad scale in analytics technology as big data and/or digitalization are done by firms without having a clear strategy of how such activities will be exactly used to generate potentially new business opportunities and therefore improving the financial performance of such companies (Kohtamäki et al., 2020).

Even with the evidence of digitalization investments and a firm's performance has been presented in the literature, the relationship is highly complex and seldom linear (Kohtamäki et al., 2020) which would be line with several other scholars that have highlighted opposite evidence meaning that the value of information technology may be questionable when it comes to performance increases (Brynjolfsson & Hitt, 1998; Kettinger et al., 1994). However, a differentiation by digitalization effort is suggested. In their study of 131 manufacturing firms in the digitalization and servitization space Kohtamaki et al. (2020) found out that less complex easy to implement digitalization activities as IT tooling seem to produce a positive direct effect on financial performance and with-it ROI if associated implementation costs are low. This finding is in line with the view of Sjödin et al. (2019) that also states that easy to implement systems can improve effectiveness of customer service and other activities having the potential to deliver direct financial improvements and firms might be advised to focus on such low hanging fruits. However, if IT investments are higher such investment should be supported by additional organizational capabilities to make the IT investment profitable with the downside that such supporting acitvities can make the investment even more complex and resource taking (Kohtamaki et al., 2020).

A view that is echoed in the literature on several occasions is that investments in larger digital architectures require significant integration that often goes along with costly, heavy, and lengthy integration projects in order to cope with often outdated legacy infrastructure (Haynes & Thompson, 2000; Kazanavičius & Mažeika, 2019; Landauer, 1995).

'… there's a lot of technology debt out there. A lot of companies that have invested in trying to do these things, and it hasn't been effective, or it hasn't succeeded. And so it's very much worth doing the ROI analysis on these things, to make sure that whatever costs that are being considered, will be offset by the gains.'

(Consultant 2).

4.7 Summary of Explorative Qualitative Expert Interviews

Several key topics with regard to latest knowledge in B2B service digitalization were covered in this chapter by engaging with knowledgeable experts in this field.

First, different definitions of service digitalization in B2B were uncovered along different customer types and from a consultant perspective.

Second, a set of benefits and costs within B2B service digitalization activities were explored from a provider and user perspective.

Third, several influencing factors of service digitalization in B2B were discovered and structured along three dimensions i.e. technology, organisation, and environment.

Fourth, a set of key challenge dimensions in B2B service digitalization were revealed that serve as a preliminary structure for the sub-sequent case studies.

All findings are critically reflected with the literature (see Section 6.1).

5 RESEARCH STAGE 2 – IN-DEPTH CASE STUDIES

The previous chapter has explored the potential and influencing factors of B2B service digitalization in relationship value management by exploring the views of experts in the field. What has not been answered yet is whether there is a difference in how companies approach potential efficiency and effectiveness and the extent to which the establishment of organizational capabilities and other factors differ. This seems reasonable to research, as companies tend to underestimate digitalization endeavours, as argued in the previous sections and in the literature (see Table 1). In answering this, this research project could provide guidance to companies that are considering engaging in digitalization efforts by pointing out possible influencing factors, benefits, and costs as well indicating how to approach the efficiency potential in contrast to the effectiveness potential. Therefore, the following research question was added at the end of the Stage 1 research, to be addressed in Stage 2:

RQ3: How do B2B companies manage service digitalization projects in practice, and what are the potential challenges and learnings?

5.1 Case Study 1 – Efficiency Case 'Doing things right.'

5.1.1 Case Selection and Description – a Multinational Business-to-Business Telecommunication Company

An important prerequisite of this case study approach was to find an organization in the B2B space that has implemented an efficiency driven service digitalization activity, having a pool of experiences throughout the implementation process but also first-hand internal as well as external client feedbacks. The B2B organization that was chosen fitted these requirements. 'Efficiency Co.' (a pseudonym) is the Germany based B2B branch local subsidiary of a large international telecommunication operator headquartered in

Western Europe. Efficiency Co.'s business model involves commercializing tangible telecommunications assets like fixed- and mobile infrastructure. The organization serves all types and sizes and sectors of B2B commercial and institutional clients by offering a full range of standard to complex telecommunication solutions as voice, data, IoT, cloud and UCC (Unified Collaboration and Communication) products and services.

In 2011, Efficiency Co. decided to initiate a self-service B2B tool that should enable clients to receive support services via an online platform which were formerly provided by traditional communication channels as letters, e-mail, telephone or in-person meetings. Services in this online platform to be provided digitally would include billing details (paper to digital), usage details (consumption of a service as data volume), new order and re-order of products and services as well as upgrade of services (additional mobile sim-card or fixed products) etc. The intended objective of Efficiency Co. offering a digital self-service platform, driven by market demands and internal cost pressures, was to provide the same telecommunication services much faster, in higher quality, in real-time, every time with the intention to increase internal and external operational efficiency.

Efficiency Co. qualifies as an example for efficiency driven digitalization activities out of several reasons. On the one hand, Efficiency Co. strategic intend was to explicitly establish a self-service platform to optimise existing processes with the use of technology in form of digitalization as stated above. As a result, formerly manual processes as the subscriber identity module (SIM) exchange (a SIM is needed in every mobile phone as it stores the subscriber identity), that were conducted via personal communication formats as mail or phone, were now fully digitalised. In this respect the service, changing sim-cards, stayed the same, however the format and process changed from personal to digital. On the other hand, Efficiency Co. created no entirely new service or product or any change in financial aspects as billing which would have been an indication for innovation use cases and therefore effectiveness (Loebbecke & Picot, 2015). As a result, there were no changes to the fundamental service- or product portfolio that is offered towards clients but more

how this is offered. Consequently, the activities of Efficiency Co. are an optimization of the existing business model and underlying processes meaning what is delivered stays the same (Rachinger et al., 2018; Teece, 2018).

5.1.2 Case Study 1 - Results

In the following Section the results from the Efficiency Co. case study are outlined. Based on the findings from literature review and insights from explorative expert interviews within this research project the ‘B2B Service Digitalization initial Value Framework’ (see Figure 33) is employed to generate ‘thick description’ of the case and its context as pointed out by Yin (2018).

The initial ‘B2B Service Digitalization Framework’ consists of numerous elements exemplifying the internal and external context of underlying organization as environment, relationship types, product and services, certain processes, and technology in use. Corsaro and Anzivino (2021) affirmed the importance of context and detailed information to explain value generation mechanisms. Case studies address this demand by considering the specific characteristics of each case. In detail and specifically for this case study the results will be presented by referring in a first step to details of Efficiency Co. as an organization including information about possible influencing factor categories that were identified in phase 1 interviews and literature review - in other words environment, products- & services, processes, technology and relationship types. In a second step, results will be structured along the ‘Digitalization Challenge Dimensions’ from section 4.6, which served as well as a provisional coding scheme (Vision, Business Model, People, Technology and Data, Change Management, and Financial Aspects).

5.1.2.1 Influence Factors

One major influence factor for Efficiency Co. to engage in efficiency digitalization project was a developing dynamic market situation. Information regarding the market situation of Efficiency Co. was shared by six out of eight

interviews with respectively 26 references and can be clustered in two main fields - in other words external macro-environment developments and competitor landscape.

When Efficiency Co. started its self-service digitalization activities in 2010 it must be acknowledged that this was the post-period of the first two iPhone mobile phone models that were launched by Apple revolutionizing how to connect and use digital applications in a way that the status quo in telecommunications was challenged heavily. With Apple launching the iPhone and its corresponding environment as iTunes a new standard of how to digitally interact and to fulfil use cases was set changing the behaviour as well as expectations of buyers in their private environment (West & Mace, 2010). However, these changes in the setting of B2C buyers had spill-over effects in B2B as B2C buyers were sometimes B2B buyers and decision makers as well (Lilien, 2016). In parallel it was the time when Amazon.com heavily expanded its activities way beyond book services gaining heavy market shares over the world including Germany, heavily attacking the retail segment by offering best in class customer centric and most of all easy-to-use digital services with focus self-service similar changing customer expectations (Rikap, 2022). This market development by Apple, Amazon, Google and many others had several interesting aspects. On the one hand, there were new and innovative solutions in the market echoing somehow a certain ‘innovation appeal’ which was attractive to Efficiency Co.

‘Already 10 years ago we compared ourselves with companies that were much more advanced than us in such fields as Amazon or Google or others and we had the ambition to be innovative, too.’

(Interview 1 - Motivation to Implement category).

On the other hand, it was pure commercial considerations that almost forced them to engage in digital self-service activities. It was due to the fact that more and more corporate segment customers demanded the self-service portals back then and Efficiency Co. loosing numerous tenders as it could not provide such services. Interestingly back in 2010 it came out of large corporate and public

tendering and not bottom up from the mass market segments, where the commercial initiation spark was initiated.

'Back in 2010 when the self-portal was initiated Efficiency Co. has lost numerous large tenders because we were not competitive in the field of business- and service portals. We had no understanding at all what the market demands were.'

(Interview 2 - Motivation to Implement category).

The loss of competitive capability was back than as today one key concern of Efficiency Co. that operates in a highly competitive market which can be classified as saturated, capital intensive due to heavy telecommunication infrastructure investments, competition on regional to national and international level and new market players entering. The competitor landscape is even more challenging today as total market volumes in terms of commercial market potential has been decreasing due to heavy price erosion based on increased competition. This in combination with even higher capital expenditures to support complex physical infrastructure (Mobile towers, cables, data centres), which is the basis of Efficiency Co.'s business model to provide telecommunication services, has fuelled a history of efficiency driven transformation programmes focussing on efficiency measures. This commercially intense environment can be seen as another influencing factor that paved the way for an organizational openness to introduce such service digitalization, which were at that scale new to Efficiency Co. at that time.

It must be acknowledged that the mentioned influencing factor, even if there are 10 years old, have a certain relevance nowadays. Market environment has even more intensified and innovation appeal of so called 'over the top' players as Google, Amazon, and Apple has been stayed the same according to interviewees. However new factors came along putting a further motivation to have, maintain, and develop self-service digital portals for Efficiency Co. and the market.

With the introduction of GDPR (General Data Protection Regulation) by the EU in 2016 and EECC (European Electronic Communications code) regulation framework new demands in data privacy topics as data portability must be

legally and commercially fulfilled by telecommunications carriers as Efficiency Co. and other parties that are hardly to be realized without any self-service digital business portal capability (Perarnaud, 2022).

'Because we have this external influence factor EECC as an European directive implementing our self-service tool became even more important.'

(Interview 6 - Motivation to Implement category).

To realise the EECC requirements, which gives the end-user certain rights to have transparency about the use, creation, management of its personal data, automatic data gathering systems as online self-services are regarded as the more efficient ways of fulfilling this demand. Gathering and communicating manually EECC requests using traditional medium as email or hardcopy mailing are possible however time intense, quality prone and therefore highly cost intensive. In this sense, EECC can be seen as an influencing factor for Efficiency Co. to further develop a digital self-service tool as well as benefit element - in other words, fulfilling legal requirements in an efficient way.

5.1.2.2 Provider Benefits

Benefits and costs associated with Efficiency Co.'s digital self-service tool were focus areas and operationalized in several questions within the interview questionnaire (see Appendix IIIa, Figure 48). 164 references were made by the interviewees in these fields. To structure the references a dyadic approach will be taken meaning that benefits, costs, and value from a provider as well as user perspective will be presented.

Based on total references made in the field of benefits, costs, and value 52 can be attributed to the provider side and 112 to the user side (see Table 14 & Table 15).

On the provider side the following can be said. In total 34 references were made to benefits which for the main part can be ascribed to two sub-fields - in other words 'front desk optimization-' and 'higher quality & increased speed benefits'. Front desk optimization benefits comprise the whole field of deflecting standard

service request volumes (sim-card changes, ordering new sim-cards, requesting data usage details etc.) from frontline service and sales employees to the digital self-service tool of Efficiency Co.

‘And that was our fundamental ambition, meaning to tackle service digitalisation because the customers want it anyway and to relieve our employees in a way to use their capacity for more complex cases in a dynamic world that is in constant change.’

*(*Interview 4 - Front Desk Capacity Optimization category).

The effect of deflecting such volumes was that Efficiency Co. could decide how to use the new available capacity of their service and sales employees which they did by addressing more complex fields that were not in the digital self-service tool as fixed line telecommunication services. In addition, as service request were often channelled through sales employees, they could use this gained capacity by focussing on their core sales functions as using the time to increase their sales pipeline. As an alternative, Efficiency Co. could have decided to use the gained capacity to optimize their cost structure by reducing their service employees.

About higher quality and speed feedbacks the following can be stated. With the introduction of the self-service tool at Efficiency Co. it was possible to increase the speed of standard service request tremendously. What was requested via mail or phone taking days and sometimes weeks to solve was now possible in real-time meaning that the customer to answer it service request instantaneously. In addition, as the self-service tool is based on clear structures, automated processes and underlying commercial and technical logics quality levels were tremendously raised. As manual processes are easily error prone, due to copy-paste mistakes, misinterpretation of the request and many more this could be improved by taking out the ‘manual’ by replacing it with ‘automatic’ processes guiding the customers to resolve their service requests.

Besides the main benefit categories presented above there were some further comments which are worth mentioning to give a more complete picture. It was mentioned that the increase of quality and speed as well as deflection of monotonous tasks had an impact on employee motivation. On the one hand,

employees could use their time of more meaningful tasks that had a motivating effect. On the other hand, customer contacts were richer meaning that employees could engage in solution focused conversations which were more task focussed only before. This led to increased customers satisfaction that was stated to have a positive impact as well on employee motivation in a sense as 'happy customer, happy employee'. In addition, it was mentioned that the self-service tool had a log-in effect meaning that customer using it stay longer with Efficiency Co. as they integrate it in their way of working processes. Another benefit that was mentioned was that Efficiency Co. fulfilled clear market demands with this self-service tool re-gaining their competitive capability that was at risk before.

'For B2B customers having self-service is nowadays seen as standard requirement, back then it just came up.'

(Interview 4 – Market orientation & Log-in Effect category).

5.1.2.3 Provider Costs

Taking a cost provider perspective, meaning what costs did occur to Efficiency Co. in relation to the digital self-service tool, the following can be stated. In total 14 references to costs were made. In general, and from an investment point of view of 'costs', Efficiency Co. had to staff and fund an internal project management team as well as to provide yearly funds for the technical provisioning and maintenance of the tool which was mainly done externally and bound to a licensing-fee model. Such costs structures changed in the due time of the lifespan of the tool. There was a shift from one-off implementation costs to a licensing fee-based model as volumes of the self-service tool massively increased over time. In addition, as new functionalities were successively introduced the cost of implementing such changes increased as the complexity of the tool in general increased with the additional challenge that the architectural code on which the self-service tool is technologically build is from 2009 which can be critical in fast changing IT environment. Henceforth, more

costs incurred making it indispensable to provide increased funds to cover what was called ‘cost of complexity’.

‘*The code is from 2009, 2010 and we added more and more functionalities since then which made the system so complex having so many interdependencies … In short the system became too big and complex to build bigger new functionalities.’*

(Interview 5 - Provider Costs category).

Besides these standard costs of IT project implementation and maintenance in general where time, material and budget are fundamental elements, other types of costs materialized in the interviews (Atkinson, 1999; Pace, 2019).

‘Cost to transform’ were one additional category mentioned meaning that besides the technological and processual changes to the organization there were costs associated with change management procedures that occurred. Examples would range from explicitly hiring people who did the internal communication of Efficiency Co., organizing roundtables, communication updates etc. up to dedicated trainings on how to use the self-service tool for internal staff and external stakeholders as customers.

The internal communication management was highlighted as an important aspect as numerous internal stakeholders especially on the service- and sales frontline positions feared to be replaced by the self-service tool. Another fear was to lose the relationship to the customer base.

Table 14: Provider Efficiency Costs and Benefits from Practice – Efficiency Co. Case

Value Elements	Provider side - *52 references*
A. BENEFITS	• **Services & Sales Front Desk Volume Optimization** *(Re-use gained capacity for more complex cases and/or save budget)* • **Higher Quality and Speed** *(Replacing the manual with the automatic, save on capacity, increase customer satisfaction, fulfil legal requirements)* • **Increased Employee Motivation** (Less monotonous tasks, more capacity in core function) • **Fulfilment Legal requirements (EECC)**
B. COSTS	• **Implementation cost:** Program Mgmt costs, IT Infrastructure one-offs • **Maintenance costs:** Licensing costs correlating with activity volume • **Costs of complexity & Legacy:** nowadays outdated infrastructure facing latest customer demands • **Cost to transform:** Communication, change mgmt. activities
OTHERS	• **Potential disbenefits** as loosing customer contact or fear of being replaced reducing employee motivation

5.1.2.4 User Benefits

About user benefits and costs of Efficiency Co.'s digital self-service tool the following can be stated. In general, more references were made on the 'user' benefits and costs side with 112 references when comparing it to the 'provider' side account for 52 references (see Table 14). References are based on what the key internal informants said what they perceive to be possible user benefits and costs and as well as what was stated from the external participant and user of the tool having a procurement background.

Taking a high-level user benefit perspective first it can be said that the main part of the reference fall in the following clusters i.e. 'Increased Availability, Quality and Speed', 'Increased Transparency' leading to 'Higher Customer Satisfaction'. The 'Increased Availability, Quality, and Speed' category comprises mentioned benefits as the 24/7 availability of the tool. This includes the possibility to consume standard telecommunication services as sim-card

activations, tariff changes or certain reports anytime, anywhere, independent of working hours of Efficiency Co. service employees.

'As a customer I have one view on all the topics. I can optimise myself because I'm not bound to service desk hours. I can do it 24/7… I can do it on the weekend, and I can be sure that it is done. Such a transparency does not exist in an offline world.'

(Interview 8 – Increased Availability, Quality, and Speed category).

In a pre-self-service time at Efficiency Co. it was necessary to provide certain service resources to fulfil the service request of the customer. Either this was done in direct contact via phone, which was only possible at service desk opening hours, or it was done at a certain time after the request was sent by mail or elsewise which left a certain timely gap between service request addressed and fulfilled which could last up to several days. With the tool this dependency of available capacity and time constraints were obsolete as the it operates 24/7, processing requests automatically.

Within the 'Increased transparency' category user benefits were mentioned as a technical possibility to have detailed reports on telecommunication product usage as minutes, data volume consumed by user going as far as integrating specific cost-structures of the end-customer to better manage cost centres. Such reports were available before; however, they had to be requested manually, their production took several days to weeks depending on Efficiency Co.'s service employee availability up to that there were certain quality issues as this process was manually and therefore error prone. With Efficiency Co's digital self-service tool it became easier and more efficient to fulfil such transparency customer demands. In addition, as everything is digitally structured and archived the customer receives maximum of transparency what was purchased and might have a commercial and legal implication for services billed, how services of Efficiency Co. are used by own employees, a pre-requisite that is needed to be legally compliant in Germany. With that it became much more transparent and easier to access what was hidden in hardcopy paper or had to be manually requested before.

5.1.2.5 User Costs

Taking the ‘User Costs’ perspective the following was identified. There are no direct associated costs associated with the use of Efficiency Co.’s digital self-service tool meaning that its usage is free of charge of the end-user no matter what is being used or how many users are accessing the tool. However, it was mentioned by several internal interviewees as well as the external user that there are certain indirect costs associated with the tool. Indirect costs would comprise the time investment of the user to get familiar with the tool. Time to be spend in online or offline trainings, time to produce the first use cases as sim-card activations or developing certain report meaning things that were previously requested in person by speaking to the service employee or sending a mail. All of these can be seen as some kind of ‘opportunity cost’ considerations meaning that what are the costs (time investment) of doing it myself as a customer in comparison to that if someone else, the service manager, is doing it. Interestingly such opportunity cost or trade-offs were mentioned to be very granular and heterogenous. References were made that some users are open to use the tool as they know digital self-service from private environment as online-banking; others might be more reserved up to afraid of using the tool as they are technically not at ease therefore having possible preferences to talking to service employees in person. Other interviewee comments touched the topic of user scepticism. Some users felt that they had to do something in addition in this digital environment that was done by someone else previously, the service manager before.

‘Especially in the beginning customers felt really degraded and less valued because we said, ‘Do that on your own!’. Some said, ‘Where is my discount, if I do that on my own and my value add?’ and our response was ‘Well, your value-add is that you can do it 24/7 and is much quicker’ and some said ‘No, it is much quicker for me if I talk to Mrs. Müller.’

*(*Interview 1 – User Costs category).

Table 15: User Efficiency Benefits & Costs - Efficiency Co. Case

Value Elements	User Side – *112 References*
A. BENEFITS	• **Continuous Availability** – 24/7 service use case fulfilment • **Maximised Quality** – no errors due to automatic, pre-defined use case structures • **Increased Speed** – much higher service fulfilment up to just in time • **Higher Transparency & usability** – products services usage, commercial contract details & legal compliance
B. COSTS	• **Opportunity costs** – subjective cost judgment not to have personal contact anymore • **Cost to Transform / Cost of transition** – cost related to get familiar with the tool as participating in seminars, self-study time etc.

From analytical perspective the number of references connected to user benefits (33 references) outnumber the number of references associated with costs. Interestingly, even with the main user benefits being confirmed with the external customers interview the 'value' feedback, meaning how much the external user is valuing Efficiency Co.'s digital self-serve tool, the interviewer got the impression that it is valued but in a way that it is taken for granted as the external participant described in detail that it is a valuable tool; however, nothing special. In addition, it seemed that there was no worth mentioning competitive advantage to it but and more a mere 'nice to have' service support offering.

This seems in contrast to comments within the internal interview pool at first sight where a digital self-serve tool was mentioned to be primarily a request in corporate tenders. However, a possible interpretation could be that it is a primary request for many companies, however it is no competitive differentiation anymore, it is a hygiene factor meaning if you don't have it you are out, if you have it you stay in the game which does not necessarily mean you will win.

5.1.3 Efficiency Co.'s Internal Challenge Dimension Results

One major intend of the case study was to gain in-practice insights within the digitalization adoption dimension that were identified in phase 1 explorative expert interviews i.e. Vision, Business Model, People, Technology and Data, Change Management, and Financial Aspects (see Section 4.6).

Figure 28: Internal Adoption Dimension Elements at Efficiency Co.

Challenge Dimension	Results	Insights
01. Vision *(99 references)*	• Different Vision levels exist • Senior Mgmt. Level as driver • Core Program Team level further key driver • Employee Level engagement as the ultimate objective	'Vision' is no homogeneous but differs among stakeholders. Vision is dynamic meaning it evolves over time
02. Business Model *(8 references)*	• Mainly Business process optimization no big new things but existing things got better • Less Business Model transformation	What is offered and sold and maintained stays the same, but the format is changed (Efficiency gains.)
03. People *(196 references)*	• Main capabilities were available • Missing capabilities complemented with external resources • Diverse mind-set within the organisation • Change in internal and external Ways of Working	'People' cluster is multi-layered. It is not just about functions and their capabilities it is about how they engage in ways of working and what mind-set there is.
04. Data & Technology *(89 references)*	• Data quality as pre-requisite for digital services • Data utilization • Data model & processes	Even with being familiar with data & data mgmt. Efficiency Co. had to solve data quality issues. Data is nothing without data processing and utilization.
05. Change Management *(83 references)*	• There are mass audience and individual change management activities • There are external (client/users) and internal (employee levels) change management activities	There is not one dominant change management activity but the combination of heterogenous elements. There is not one recipient of change management activities but there are several internal as well as external stakeholder groups.
06. Financial *(34 references)*	• Business case driver delivery as key element to receive funding • Presenting a 'financial story' as another key success factor	There is no free lunch meaning investments need to be backed up with benefits delivery. Being too transparent, presenting single functionalities only does not achieve the objective.

5.1.3.1 Vision at Efficiency Co.

With respect to 'Vision' in total 99 references were identified within the key informant interviews having three main sub-clusters that materialized 'Senior Mgmt & Vision', 'Core Team Vision', and 'Employee Vision'. The feedback on impact of 'Senior Management' is multi-layered.

On the one hand, numerous references mentioned the importance of one Senior Management representative, having the profit and loss responsibility of the B2B service operations team at Efficiency Co.

On several occasions and based on different key informant statements it was confirmed that it was him, who was the driving force and key success factor for initialization and realization of the digital self-service tool. Securing budget and

resources, constantly overcoming political barriers within the organization, a resistance to certain changes were some of the main tasks. In addition, communicating a clear vision to higher management level as board members in charge of budgets as well as lower-level management and employees were part of his tasks. As such the 'Senior Management Vision' at Efficiency Co. was very much bound to one single person, who acted as a key change officer that provided the foundation and necessary resources including tying alliances with critical stakeholders on his level as sales or IT.

'For us as a service unit it was a challenging ambition (to introduce digital self-service) and I'm thankful that we had our Senior Service Manager, who already saw the 'tomorrow' back then and who realised that it makes no sense to use endless man-power for simple task that could be done with service digitalization.'

*(*Interview 3 – Senior Management Vision category).

Besides the service senior manager who was a key figure it was mentioned that he alone would have not been successful. It was the combination of senior managers from diverse discipline as sales, who were in touch with the customer as well fulfilling certain service tasks as well as senior managers from IT that were needed to realise the IT aspects of the tool.

However, some statements from the interviews indicate that creating a vision and using it to gain the intended support as resources and budget was not always consistent and could have been much more. There is some indication that the board management level agreed to realise certain funds and resources, but this was an intense process. In general, board management level at Efficiency Co.'s rarely engaged in a vision construction itself it was more the level below that was in charge.

'The board level supported too late and too little the whole initiative, I was the only full-time internal employee back than and everyone else were external hires. That is not how you cover a strategic project.'

*(*Interview 3 – Senior Management Vision category).

Another key aspect of ‘Vision’ was connected to the core team that was in charge to realise Efficiency Co.’s digital self-service tool (15 references). Members of the core team were representatives from Service, Sales, Marketing, IT and other functions that were necessary to end-to-end realization of the project. Several key informants spoke of this core team as the ‘musketeers’ or ‘alliance of the willing’ that developed, shared, and communicated a strong vision throughout the whole organization to engage and convince more and more stakeholders throughout all levels. Their way of working was unconventional at that time meaning that hierarchical structures did not exist, and functional silos were dissolved which was unusual at that period around the year 2012ff at Efficiency Co. and could be best explained with some ‘agile’ way of working as it is common in nowadays IT management practice (Perkin & Abraham, 2021).

‘It really helped that we had a community of people from service and sales and others that really know what the customers want and how to present it. And this own community, that we have built together, was the reason why we had a totally different mindset (towards digital self-service)’.

(Interview 1 – Core Team Vision category).

Besides references having a connection to senior management or the core team, there were also indications on vision and the lower management and employee level which can be classified as more diverse. Based on several feedbacks there is a notion that besides the part of organisation being motivated to engage in digitalization endeavours there was a certain degree of scepticism present throughout the organization. There were service operation employees who were afraid that they are replaced by a tool, some sales representatives were afraid to lose customer contacts or lose control about the activities customers are engaging in.

‘For sure there were also people - as always-, those sceptics within this world who said ‘Oh, will people get fired?’. And this was at a time where the general media has promoted digitalization as the job killer of the future.’

(Interview 3 - Vision & Culture part category).

In addition, there was a conscient workers council at Efficiency Co.'s, who was critical to what extend the intended changes were thought through having a gate keeping role to protect the jobs of service employees and to ensure that changes are managed accordingly and in favour of the employee. There is an indication that the vision in general was diverse and not homogeneous, and it took time to create the common understanding etc.

'There was another topic we had to manage. There was a department with a department head that was in charge to develop the topic. However, this bunch of people had a different understanding of what has to be done and what will be the result as the employees that would actually work therefore.'

(Interview 1 – Vision & Culture category).

5.1.3.2 Business Model Impact at Efficiency Co.

About the business model impact of Efficiency Co.'s digital self-service tool several references were made. It can be stated that there was little worth mentioning change in Efficiency Co.'s business model meaning what products or services are offered. In the end, all the services that are provided via the self-service tool were available before; however much more complicated and resource taking to be generated. Efficiency Co.'s digital self-service tool is therefore more an optimization of the business process which can be understood as a minor part and therefore no change of the entire business model.

'With regard to our business model it was maybe a facilitator but not a real driver that would have changed our business model. … However, it directed us towards more simplicity and increased transparency towards the customer.'

(Interview 4 – Business Model category).

5.1.3.3 People at Efficiency Co.

The 'People' adoption category has been a major topic within the interviewees accounting for 196 identified references which were divided within the following

sub-structures: Capability (34 references), Mindset (44 references), Way of Working (69 references) and Motivation and Organisational Change (32 references).

With regard to ‘people and capability’ the following can be said. Efficiency Co. understands people capability as the functional qualifications necessary in order to realise a certain project, in this case a digital self-service to target standard service tasks. The capability category feedbacks can be sub-divided in three sub-clusters: existing- (16 references), partially existing- (14 references) and non-existing capabilities (10 references).

The general feedback has been that Efficiency Co. had a broad pool of diverse expertise and capability to manage the project. Different functions came from service and sales departments, where most of the service use cases were allocated that were subject to be realised in the digital self-service tool, as well as from EfficiencyCo’s IT department. However, these functions were successively integrated in a core management team being complemented by external hired programme manager that managed all different working packages. Efficiency Co. people strategy was to allocate not only knowledgeable experts in the project but top tier representatives of their function that had a certain standing within the organization to engage as change agents.

‘From my perspective the best people were brought together our organization had in order to build that thing [digital self-service tool].’

(Interview 1 - Capability category).

It has to be mentioned that the service function had a leading role and as they were commercial owning the service use cases and pushing the programme including the profit and loss responsible senior service manager.

The established core team consisting of top tier functional experts was the functional nucleus to decide on what service use cases to target, whom to engage to realise that, managing the process of technically realising it, and owning the internal and external communication and change management road to implement it. However, as the technical foundation of the self-service tool

was decided to be managed externally to Efficiency Co's. core infrastructure out of cost reasons, as estimations for internal realization has been much more expensive, there were new requirements on capabilities. It has to be mentioned that the core team seemed to have already the main part of expertise at hand to deliver large part of the requirements.

'What really surprised me was how much we could obviously realise on our own. That was really, really good already from the very beginning. We also had external freelancers that have programmed everything, but they just did what we told them to do.'

*(*Interview 3: People capability category).

Examples of only partly to non-existing capabilities that were required included dedicated programmers that understood and build the IT infrastructure that was hosted externally as well as user experience designers designing the so-called workflows out of a customer perspective. Both were externally hired over years. However, it was necessary to complement the external technical expertise with internal expertise to connect the external system with data, information and processes that were core to Efficiency Co.'s IT infrastructure. Such resources were successively integrated in the project or the relevant expertise successively build up meaning that existing roles within the core team took over such tasks by learning on the job. In general, it can be said that Efficiency Co.'s strategy was to complement internal expertise in a first step by hiring free lancers and trying to convince them to become part of Efficiency Co. organization afterwards. Regarding 'mindset' (44 references) it can be said that feedback in the interviews was diverse meaning that there were many indications around positive mindsets (25 references), negative mindset (16 references) and neutral (7 references).

'The Mind-set really depends to whom you talk. Within service operations I would say it as 50/50. 50 percent saw it as a chance, 50 percent saw it as a risk to lose their job … Sales was afraid in the beginning because 'Okay, the client doesn't call me anymore' … it really, really took long until everyone understood that the tool is no internal competition but a support.'

(Interview 1: People & Mind-Set category).

At Efficiency Co. ‘mindset’ is understood as the attitude, opinion of a certain stakeholder towards a certain thing in this case the digital self-service tool. The positive reference includes statements that people were chosen that had already a certain positive mind-set often referred to as openness to new innovative topics.

In addition, numerous references were made with regard to that the communication of a clear vision was an enormous value-add to the project; even more as this had a positive influence on the mind-set of people externally of the core team. This positive mind-set seemed to be one key facilitator to make project management much smoother and to overcome periods were there were fall-backs when intended functions did not work as planned. However, where there is light there is shade as there were as well sceptics amongst the organization.

Numerous references were associated with ‘way of working’ (69 references) which is understood at Efficiency Co. how a certain task is fulfilled amongst a certain group of stakeholders. On a high-level basis there were 13 references made with regard to external changes in ‘way of working’ and the rest addressing internal changes at Efficiency Co. Within the internal set of references, it was highlighted that there were different levels of ‘way of working’.

On the one hand, there was a change in how to execute the project itself. In detail, what was managed based on standard IT procedures back in the early 2010s, which was a pure waterfall set up meaning that work packages were chronologically managed with strict hierarchies and functional responsibilities, became a more agile- meaning flexible set up to manage project when implementing the digital self-service platform.

There were several feedbacks that highlighted that it was new to work so closely and cross-functional in this case: sales, service, and IT. There was a strong alignment between the stakeholders that was not known as such before. The effect was a smoother execution process.

Besides a much more aligned and smoother execution process also more non-orthodox formats came up. This was the case not because Efficiency Co. management imposed it but out of the general setting and within a bottom-up

engagement from the core team members themselves. Such formats included informal coffee appointments to engage stakeholders which were still resisting. This was informally called the ‘coffee alliance’ at Efficiency Co.

In addition, ways of working went beyond the organizational context of Efficiency Co. meaning that people met outside of standard business hours to further push the project.

‘Well, there were representative from six or seven units who were willing to go the extra mile. On several occasion we all individually sat late at home having a glass of wine, a hot chocolate or elsewise at hand – when all the kids were already in bed – and we jointly reflected how to solve a problem. And there was so much energy around, everyone wanted to make it even better and better and that is how it was created.’

*(*Interview 3 – People & Way of Working category).

The digital self-service tool had as well an impact of how things were done externally to the organization. It was new to Efficiency Co., and its clients, that the client itself takes over tasks that were previously done at Efficiency Co. internally. This meant a full series of changes on established external ‘way of workings’.

First, the client needed to be convinced and empowered to use the new tool. This was seen as a re-education of the client meaning that ‘you have done it several years like that, now you have to do it like that’.

Second, service employees had to be convinced, trained, and empowered to channel all service request to digital meaning that service request that came in the traditional way were rejected.

This process was not without fall-backs, and it was part of the project to learn what is reasonable that the client does on its own and what is not.

5.1.3.4 Technology and Data at Efficiency Co.

‘Data & Technology’ has in total 89 references that can be further clustered in addressing data quality (14 references), data utilization (12 references), and aspects of data modelling (10 references).

In general, it can be said that as a telecommunications carrier, the generation of data and its management is a key pillar of Efficiency Co’s business model as nowadays telecommunications products and services are built entirely on digital data. Types of data range from IP-Protocols that transport voice or text data in real-time up to where this data was generated, what that it is transported to whom at what time. Due to this sensitivity of data Efficiency Co. is regulated by the *Bundesnetzagentur,* an institution of the federal republic of Germany that imposes rules and regulations on every telecommunication provider offering telecommunication products and services (Homann, 2021).

Within this case study data and technology is understood in the context of the digital self-serve tool like commercial data including frame contracts, portfolios of commercial services and products in form of tariffs, billing details up to usage data as data and/or voice volumes per user. With regard to data quality, it was mentioned within numerous references that in order to digitalise a certain product and/or service it was important to reduce complexity. This was not from a technological direction, where it would have been technically possible to bring all the different variation of product and services to the self-serving tool, it was more from a customer experience consideration. In detail, it was questioned how much complexity the end-user and respectively client can manage on its own.

In the process of reducing the complexity it became clear that there were numerous data quality issues. For the first time all the existing data and corresponding processes were challenged. It can be said that over the years of telecommunication operations a lot of data processes accumulated not being much questioned if there are necessary or what quality level they have.

‘As we’ve started to migrate the data to the tool, we realised quite often that many of them were corrupted. So we needed to investigate all the corresponding systems wherever the data came from asking questions like: Why is that like that and how can we make it in the future.’

(Interview 5: Data Quality & Technology category).

As clean data was a pre-requisite to offer and fulfil digital self-service services the importance of data quality grew within Efficiency Co. So that data quality measures became more and more standard when introducing new products and services up to the point that new developments were only accepted if they were processable in a digital way.

‘The consideration of data quality as a vital element has changed in general with the project. That I strongly believe. Within the process everyone understood that a key success factor for a successful digital process is clean data.’

(Interview 6: Data Quality & Technology category).

‘Data utilization’ comprises the set of references that were identified in connection to how is the data used within the digital self-service tool. On a general level it can be said that Efficiency Co. utilized data the same way as before meaning that no new services were created to be utilized externally or to create certain new internal processes. However, Efficiency Co. analysed the user data in order to improve existing processes in the self-service. The intention was to track what users are using within the tool, what parts exactly, and by how much.

Another category was ‘data modelling’, which addresses the subject of how data is generated, aggregated, stored and manipulated to create certain information for further use. On several occasions it was highlighted that it is not just the data itself that has to be clean to be utilized. In addition, they realised that it is important to specify for what use cases it can be used, as well as to define the process in-between. This ‘in-between process’ was described as business process management as a key element of managing data. In an early phase within Efficiency Co.’s project there were only rudimentary functions of

business process management, having no one in charge of analysing, designing, and implementing such processes. Such functions were successively introduced in due-time and complemented by testing quality processes to identify and solve process errors.

5.1.3.5 Change Management at Efficiency Co.

Regarding ‘Change management’ as an adoption category 83 references were identified, which could be organized in two main sub-clusters ‘Internal Change Management Measures’ (45 references) and ‘External Change Management Measures’ (17 references).

Within the project, especially the core project management team, feedbacks in the interviews gave the strong impression that introducing a digital self-service tool was not only a technological challenge but had as well a huge change management component internally. In other words stakeholders on staff level as well as externally clients and their users were touched. About internal change management activities two major activity streams materialized in the interviews.

The change management strategy of Efficiency Co. was built on individually measures as addressing single stakeholders within the organization that were relevant for implementing and making the tool successful with individual communication formats. Individual formats would include face-to-face dialogues on all levels as senior managers talking to senior managers, functional managers to functional managers etc. This was called the ‘coffee alliance’. The strategy behind was to convince people to engage them and their staff in smaller activities first, asking for higher engagement after first success stories were realised. In addition, it became evident at Efficiency Co. that one business unit alone cannot realise the full project on its own. Consequently, stakeholders amongst other units as sales, having as well numerous contacts to clients, were engaged in the project.

Engaging such internal stakeholders successively expanding the number of people supporting the tool was mentioned to be a timely and resource taking process over long periods of time. This included as well engaging more critical

stakeholders as the workers council that was challenging the project team successively out of their employee protection perspective. This was managed by implementing regular roundtables, were intended steps were discussed, adapted, and their execution jointly agreed. All in all a series of internal information sessions, that were followed by trainings, were offered as well as a step-by-step approach taken to achieve first quick wins. This step-by-step approach was not an internal strategy only, this was also re-produced with customers in so called ‘friendly pilots’. Friendly pilots comprised a small number of customers that were willing to use the tool first as there were larger internal concerns how customers would react when being faced with the tool on a larger scale.

‘We initiated two pilots in the corporate client segment that lasted seven months because we were really afraid of massive client escalations. Imagine, we told customers, who were our clients for ten years or more and who were talking to our service managers almost every day, at one point ’no’ we don’t do that for you anymore you have to do it yourself’.

(Interview 1 – Change Management category).

Besides more individual based change formats as mentioned above Efficiency Co. implemented several mass formats to target a broader internal as well as external audience. The self-service tool was marketed at several external events as large trade fairs which was new to Efficiency Co. as in such formats only new products or services and not tools were presented. Besides the mentioned internal and external trainings Efficiency Co. decided to position the tool at internal management meeting, where the vision of the tool but also detailed functions were explained. As part of that meeting functional managers had to execute functions in tool in real-time in front of everyone with the intention to familiarize the whole management audience with the topic.

As a summary it can be said that it was a wide portfolio of change management activities ranging from individually to mass formats internally as well as externally over longer periods of time.

5.1.3.6 Finance at Efficiency Co.

Within the ‘financial aspects’ adoption factor category in total 34 references were identified with the main part referring to investment and business case elements. It was highlighted on several occasions that necessary funds, which summed up to several million Euros a year, were only approved because the previously intended benefits in the business case really materialized. However, there was some indication in the interviews that deciding on the topics for which the available budget was spent were intensive discussions as demands surpassed budget available leading to clear prioritization principles based on clear business case benefits.

It became also clear that official business cases to get Efficiency Co.’s digitalization project approved stated highly ambitious and comprehensible benefits that were easy to digest for senior management. The interviewer got the impression that it was a certain key success factor for the project to create a high-level comprehensible finance story in order to get approvals for budgets even when presented use of budget is not in full alignment with what it is ‘really’ done within the project.

‘If you just ask for single functionalities only funding you have a little chance to make it pass in the different committees … financing digitalization projects, I mean complex digitalization topics, need a well thought through finance pitch and certain visualization of numbers. And that is a thing not easy to do.’

(Interview 4 – Financial Aspects category).

5.1.4 The Efficiency Journey - Phases, Scope, Challenges and Learnings

It became evident within the interviews that throughout Efficiency Co.’s service digitalization journey different challenges and learnings came up forcing the core project management team to adapt their scope and certain way of workings. As such, adaptations are connected to the progress of the project over time this section will give the reader an overview of project phases and

corresponding challenges and learnings. This should give a detailed account of how digitalization strategy ‘unfolds’ in practice, over time and therefore addressing a future research direction that was highlighted in previous literature (Parida et al., 2019; Wirtz & Kowalkowski, 2022).

The subsequent phases are based on findings from latest project management, digital strategy and change management as well as IT agile project management (Bellantuono et al., 2021; Burgelman, 2020; Burgelman et al., 2018; Chanias et al., 2019; Hassani et al., 2018). Based on this research it agreed that implementing digital service activities is dynamic and can be clustered it different phases with each phase having possible different set up of corresponding elements. However, even if there is an agreement in the literature on different phases there is no agreement on digital transformation model theory or change management theory what are concrete phases.

In their systematic literature review of digital transformation and change management models, covering 173 articles, Bellantuono et al. (2021) identified several limitations of extant models. Some models address only fragmentations of the digital transformation process by focussing on vision and/or strategy definition. Others focussed on the implementation of pilot project only. No model included all phases of a digital transformation process and therefore limiting the value add of managers looking to effectively managing their digitalization projects (Bellantuono et al., 2021).

Based on the suggestions of Bellantuono et al. (2021) for this comparative case study approach the following digital transformation phases are proposed: Phase 1: Need Recognition & Initiation, Phase 2: Scope Formulation & setting the stage, Phase 3: Implementation and Scope Extension, and Phase 4: ‘Formalization & Scaling’.

Phase 1 ‘need recognition & initiation’ includes strategic consideration as certain drivers as market developments or elsewise why the digitalization activities were considered by whom and how, including first initiation steps as initiating the organizational project initiation process and defining project roles and responsibilities.

Phase 2 ‘Scope formulation and setting the stage’ includes definition of so-called deliverables meaning sum of technical functionalities in form of use cases that should be delivered at a certain point in time. This stage also includes as well scoping and implementing all necessary internal and possible external capabilities necessary to deliver the intended scope.

Phase 3: ‘Implementation & Scope Extension’ comprises the realization of the intended scope its refinement meaning that first use cases are delivered and used by internal and external stakeholders and that further functionalities are introduced.

Phase 4: ‘Formalization & Scaling’ includes the creation of standardized processes and procedures within as well as transition from a pure project set up which has a defined start and end as well as scope definition to a more formal set up where tasks and responsibilities from the project are shifted to existing or newly created organizational structures as functional departments, roles etc. This phase would also include scaling existing functionalities and scoping and implementing new ones.

To give the reader the possibility to understand Efficiency Co.’s implementation roadmap pointing out main challenges and learning the sub-sections were produced (see also Appendix IIIb, Table 29). In addition, each phase is explained in more detail providing exemplary interviewee quotes wherever adequate.

5.1.4.1 Phase 1: Need Recognition and Initiation

In 2010 Efficiency Co. found itself in challenging commercial position. On the one hand competitive pressures rose pressuring the sales organization heavily as large customers tenders were lost due to missing digital service tool which was a key criterion in numerous large volume tenders. On the other hand, cost-pressures became more and more critical especially in the service unit as revenue growth slowed down. To keep up margin contribution heavy cost cut targets were imposed especially in the service organization frontline staff. As a solution the Heads of Marketing and -Service Management proposed to set up

a project to create a digital self-service tool that shall address the growing market demand in digital service solutions as well as generating internal cost efficiencies.

The initial project team consisted of marketing and service personal working at this phase only part-time for the project. This initial team, under the guidance of a senior management member, engaged in project scoping and analysis phase. With the first months it became clear that there were numerous fields to cover overarching the sales-, service-, marketing-, but as well IT domain. To address these fields more and more functional experts were engaged by formally asking for scoping support using senior management asking their corresponding counterparts in the other units but as well informal networks on employee levels. Primary formats were in person meetings and workshops. After several months of investigation, analysing the “as is” situation, and scoping the first digital service tool functionality package, estimated costs skyrocketed and were way beyond budget availability.

Main cost drivers were due to existing internal IT legacy and missing online capability which was a key requirement for B2B customers in large tender business. As a solution Efficiency Co. senior management decided to evaluate external realisation options. Shortly after an IT system integrator was found that provided external technological platform and programming expertise to realise Efficiency Co.’s demands. However, this external realization option was viewed highly critical by Efficiency Co.’s IT department due to security and compliance risks and missing experience in this field as back in 2011 most applications were developed internally. It was due to the consistent argumentation of Efficiency Co.’s senior marketing and service management, the increasing market pressures, as well as attractive business case benefits that paved the way of engaging in such new ways of IT implementation. Interestingly, even the promoting senior management representatives, while strongly in favour of the project, were not sure if it will work out at this stage. However, the need to change made them promote the project leaving no doubt to Efficiency Co. board members, other senior managers, other management level, and employees that this is the ‘right and only thing to do’ keeping their concerns for themselves.

'Why was it the right thing to do back then. Our world became more and more complex, and we could not afford to do standard requests in the offline channels. We did not want to use service and sales frontline resources for such requests. And the third point our customers demand that [a digital self-service solution].'

(Interview 1 – Memorable Quotes category).

5.1.4.2 Phase 2: Scope Formulation and Setting the Stage

From mid-2011 onwards several crucial steps were undertaken. On the one hand, the initiated project members were successively working fulltime within the projects mainly from the field of marketing, service, and IT. In addition, more and more functional experts were added. This was possible as the underlying business case was accepted giving the project team certain initial budget volumes and official right to engage other functions which was more informally done the months before. However, this was not an easy task, it took senior management weeks of convincing conversations with their peers to get access to resources even if this was only partially and it was a mix of using official meetings and informal talks up to asking for favours to realise it. It was back at this stage that a first core team out of marketing-, service-, IT-, and later sales representatives was created which acted as the central hub of scoping use cases, managing challenges, and engaging in communication activities of the project. With the engagement of other function word spread of the project.

What was seen as a positive even innovative topic, especially in the marketing circles at Efficiency Co., was regarded more critical and with suspicion especially in the sales and service functions who saw the tool back then a possible job killer. This led to the point that the workers council felt the need to engage early in the project to possibly protect staff level interests. Managing the internal scepticism within Efficiency Co.'s organization became a critical task for the core team and senior management. This was not the only challenge; from a technological point of view it became obvious that even with external platform

available connections to internal Efficiency Co. legacy was needed which became a complex endeavour connecting external and the internal ‘world’. This became even more complex as it was realised that data quality on a process level was not adequate to realise and deliver intended customer use cases and data cleaning and simplification activities were engaged.

‘If we would have asked our technology department to implement it, they would have spent the first two to three years making solutions design behind closed doors. Giving it externally gave us already something. That was quite good in the beginning even it could not comprise all functionalities.’

(Interview 4 - Memorable Quotes category).

5.1.4.3 Phase 3: Implementation and Scope Extension

It was late as in 2013 and beginning of 2014 that first use cases were ready to go live and tested with certain pilot clients. Within this period several challenges came up. From a technological point of view the new use cases that were launched had several technical inconsistencies meaning that functions were not working as intended which is general and expected issue in IT project implementation. Besides the functional issues it became apparent that new supporting processes were needed which were not necessary before. Customers demanded their logins several times, logins were not working or other credentials were missing, so an online service desk had to be created. Tasks that were initiated from the customer on the digitally front-end were routed in first months to internal service employees who had manually resolve them as end-to-end digital processes did not yet exist. This led to a period where even more capacity on the service side was needed than without the tool and costs surpassed benefits by far. It was especially in this period when ways of working started to change, meaning that customers started to take over tasks and service management having to do additional tasks that led to frustration and scepticism that increased focus was on change management activities. Bi-weekly roundtables with the workers council, creation of internal and external trainings, as well as using multiple communication formats in addition

(Management meetings, internal newspaper) are just a selection of measures that were launched and key driver for continuing the project. The interviewer got the impression from the interviewees that it was the most critical and challenging phase of the project, almost as a tipping point, as it seemed to be a thin red line between success and failure as first benefits materialized; however, additional tasks and therefore cost appeared. It was again the senior management supported by a strong core team that seemed to be the key success factor in this phase who in combination of their project delivery roadmap and tactical communications left little doubt that this is the 'right thing to do' even within a challenging environment where there were obvious obstacles present leaving enough room for scepticism. This critical phase was overcome when introduced use cases were functioning properly, new use cases were established quicker, as learnings from the previous launches were made, and processes were more and more end-to-end with little to no manual intervention necessary. It was at this stage that benefits materialized that were present to all staff- and management levels. Examples included reinvesting time that were gained from the tool to engage in more solution-oriented service task which were much more sense making and motivating for service staff. A development that spread quite fast in the organization with the initially sceptical workers council being more neutral, more and more units that were interested in the tool.

'The digital self-service tool was an interesting tool. Quite large promises were made in the beginning, but it was error prone having several outages which led to low acceptance internally to the organisation and as well with customers.'

*(*Interview 2 – Memorable Quotes category).

5.1.4.4 Phase 4: Scaling and Formalization

After having created a full set of digital functionalities within the tool and creating a underlying internal and external process environment that has enabled Efficiency Co. employees and customers, it was time to decide how to scale volumes on the digital service platform. From several campaigns initiated

with sales and service to increase the number of customers having access to the platform as well as increasing their activities one was mentioned by several interviewees having the highest impact. It was called the ‘One Door Only’ policy meaning that there were more and more functionalities that could be only delivered digitally in a 100% self-service setting with customers being obliged do to them on their own. Even with the benefits of the tool present this policy was perceived as a possible ‘killer’ for some internal as well as external stakeholders. On the one hand, sales, and service frontline employees had to explain to their clients, why they were not allowed or could not fulfil their service demands anymore as they did previously (Formerly in person via phone, now digital only). Some clients did not understand why something has to be done by them which was done by service always before. To deliver on the high business case benefits aspirations as well as to amortise the budgets invested this was the only way to increase massively volumes. It was a period that took several months with numerous internal and external escalations where senior management had to intervene until the situation stabilised. In parallel Efficiency Co. decided to establish more formal organizational structures as creating a department within the service unit that was responsible for owning self-service portal, managing volumes, and IT demands.

Within the process of formalization previously external hired personal were hired and integrated in the newly established as well as existing structures. The intention was to provide internal capability and to reduce external dependency as well as to optimise on the cost structures as internal employees were cheaper than external ones.

‘The benefits are real. There are heavy escalations from the regions if something is not working. In that case staff says we can close our service business as we cannot manage the volumes manually. That means we really elivered we did not lie to our frontline staff out there. After seven years of transformation, we did not massively dismiss staff because we fully digitalised.’

(Interview 1 - Memorable Quotes category).

5.2 Case Study 2 – Effectiveness Case of ‘Doing the Right Things’

5.2.1 Case Selection and Description – a Multinational B2B Automotive Company

Mirroring the research approach from Case Study 1, which had an efficiency focus, the objective for this effectiveness-focussed case study was to identify a suitable B2B organization that has designed, conceptualized, and implemented a digitalization activity that concentrated on effectiveness gains and, with them, the creation of new digital service offerings with the help of technology. To establish a reasonable basis for comparison of the two case studies, the organization chosen for Case Study 2 was intended to have a pool of experiences throughout the ideation and implementation process as well as a willingness to share internal and external stakeholder feedback. The B2B organization that was chosen fitted these requirements.

Effectiveness Co. (a pseudonym) is the business division of a globally active B2B automotive organization headquartered in Western Europe that offers speciality mechanical and vehicle engineering. Effectiveness Co.’s business involves the design, construction, distribution, and after-sales service of a wide range of highly specialized industrial machinery, such as compact sweepers, truck-mounted sweepers, winter equipment, and sewer-cleaning and refuse-collection vehicles, which are organized into separate business units. The company’s products enable its customers to keep a wide array of traffic areas safe and clean. Effectiveness Co. serves various types and sizes of customers ranging from medium to large public and governmental institutions, cities, and communities, as well as private organizations in the field of industrial site cleaning and maintenance services. This includes leasing firms that buy and lease back or rent physical machinery offered by Effectiveness Co.

In 2018, Effectiveness Co. officially launched a project to initiate a digitalization initiative designed to open new revenue streams in the service space. The intention was to build compact sweepers on existing machinery and

complement them with additional digital services with the help of new technology. On the one hand, services were intended to be digital extensions of industrial machinery in the form of data-driven insights into vehicle fuel consumption, maintenance status, and real-time tracking. This data was to be provided digitally via a secure, dedicated, internet-based platform. On the other hand, based on such data-driven insights, Effectiveness Co.'s intention was to offer entirely new services and service extensions in the after-sales space as warranty extensions. The new digital services were intended to provide small turnover per service unit, but they are highly scalable in volume and, most of all, generate recurring revenue streams for the existing business model alongside the traditional large-scale, one-off, heavy-machinery hardware business. As such, Effectiveness Co.'s new endeavour can be classified as digital servitization, as discussed in section 2.6.2.

Effectiveness Co. qualifies as an example of effectiveness-driven digitalization activities for several reasons. On the one hand, the intention of the digital platform was to diversify the company's product portfolio in a completely new space – in other words, 'digital services' – meaning that something entirely new was created. Effectiveness Co. had a long history of designing, constructing, and distributing, both nationally and internationally, specialized physical machinery and associated basic services such as machinery maintenance. However, offering non-physical digital services was and is seen as an entirely new field of engagement for the company, with new ways of working internally and externally to be established. On the other hand, the digital services offered are standalone modules for purchase by the end customer, offering functionalities that could have not been offered previously without the implemented digital service platform. These services are billed differently – a recurrent monthly billing of digital service modules versus a one-off charge for physical machinery. In this respect, Effectiveness Co.'s digital platform, based on industrial machinery and the associated newly created digital service modules, qualifies as an effectiveness measure (doing the right thing).

5.2.2 Case Study 2 – Results

In the following Section the results from the Effectiveness Co. case study are outlined. Results will be presented using the same structure as outlined in case study 1 providing the same 'thick description' of the case by providing context elements as suggested by Yin (2018). In detail, after a detailed description of outlining the motivation of Effectiveness Co. to implement a digital service platform and corresponding influencing factors, a provider and user benefits versus cost view will be taken. This will be followed by explaining challenge dimensions and outlining the effectiveness implementation journey.

5.2.2.1 Influence Factors

There are several external and internal influence factors that paved the way of Effectiveness Co. kick-starting their digital service initiative in late 2017. Based on several statements from the interviews it can be said that before 2017 the general external discussion around IoT, Industry 4.0, and digital transformation within, shaped the need within Effectiveness Co. to deal with question: '*What does digitalization mean for us?'.* External influences range from best practices from the agricultural and car manufacturing space - sectors that are adjacent sectors for Effectiveness Co. operations, where innovation often materializes first and often taken over by specialty machinery sector. Other external influences shaping Effectiveness Co. mind-set on digitalization were innovations seen in totally separate sectors as the music industry, where whole business models where massively transformed. Examples in the interviews were use-cases as 'Spotify', a pay per month digital music content provider, as a representative of a whole group of newly established market actors that totally reshaped the ways of engagement and user experience up to billing logics.

Besides such external factors there were also internal developments at that period worth mentioning. One of the interviewees took part in a 'digital transformation' education program at a top tier university specialised in executive education which gave influencing feedback on the theory of how digitalization could diversify Effectiveness Co.'s business model. Other internal

developments were the increasing interest from the engineering departments in the years before 2017 to better understand how machines were used by clients. This interest was due to making better construction decisions based on usage data i.e. '*What do clients do or do not do with the machines?*'; however, in order to answer such questions much more detailed data would have been necessary, which was not the case at that time. It must be acknowledged that it became clear in the interviews that within Effectiveness Co. some basic telematic (tracking and data management of vehicles) existed; however, on an outdated tools landscape as several interviewees confirmed. In addition, this telematic system was limited to few product lines at Effectiveness Co. only. In addition, two interviewees mentioned that there was some general strategic initiative at that period initiated by the CEO to engage in digitalization activities in general and on a company wide scale including the business unit where the digital platform was eventually realised. Besides the previous influencing factors mentioned a strong motivational factor to engage in digitalization endeavours came from the commercial side and was to diversify Effectiveness Co. revenue streams from hardware sales by additional service revenue streams.

'Higher service revenues were the objective and that we will have recurrent revenues in addition to the large one offs. If a vehicle is sold it is sold and you can only grow by selling additional services.'

(Interview 1 – Motivation to implement category).

In addition to diversification of revenues of Effectiveness Co.'s business model there were also strategic consideration to implement further services when it comes to competitive advantage. It became clear in the interviews that within the niche sector of sweepers no competitor already had service offers in place based on digital technology and Effectiveness Co. saw it as a possible competitive advantage to pursue back in 2017. In addition, there were also internal considerations if benefits of such a digital service platform, as it based on detailed data analytics, could not be used to optimise existing service offering as technical telephone support more effectively in a time in which qualified technical personal is hard to recruit and machines getting more and more complex due to the different set of technologies they are built on – a

development known in car manufacturing space as well (Mičík & Mičudová, 2018).

In the end Effectiveness Co. main motivational drivers to engage in digitalization endeavours is a mix of several elements as a general commercial ambition to grow, having identified a field which could bring internal and external benefits and even being a competitive advantage fuelled by a certain market momentum in adjacent and non-adjacent markets up to individual triggers as the CEO of Effectiveness Co. addressing the topic on a company level and a senior manager taking part in executive education focussed on digital transformation.

5.2.2.2 Provider Benefits and Costs

Benefits and costs associated with the digital service platform from a provider perspective was a focus area operationalized in several questions within the interview questionnaire (Appendix IIIc). In total 73 reference throughout all interviewees were identified within the interviews which represents ~15% of all references within the Effectiveness Co. case study (see Table 16).

From a provider-perspective benefits can be clustered within a technical, operational, and commercial domain. Technical benefits for the provider would include a complete transparency of different sets of data of a machine, in this case a sweeper would generate. Besides the already mentioned ‘usage data’ as fuel consumption, mileage, and fan speed one feature became more and more important for Effectiveness Co. internal engineering and technical support team - the transparency of so called ‘error codes’. In a time prior to Effectiveness Co.’s digital service platform machine engineers had to manually extract technical data from machines which was highly time consuming as machines were in different parts of the world. However, such data meaning how a machine is used, where etc. is highly interesting to engineers, who are keen to take in-practice data to develop new generations of sweepers and other machinery making them better from the lessons learned in the past. Now with all new sweepers being digitally connected to the platform, sending their usage and technical data in real time, totally new opportunities of improving the

engineering process became apparent up to that development cycles were speeded up. The same was evident for technical support teams at Effectiveness Co. centrally and within the numerous partner markets from an operational perspective. If a machine had a problem the normal day to day practice was that the customer calls the technical service hotline, explaining the problem in a lengthy process on the phone. The service employee tried to find the specifications of the machine and interpreting to the best of his knowledge what could be wrong. In times of digital service platform technical service staff already sees in the moment that an error occurs its documentation in the platform. If a customer calls the service staff member has already a list of details about the machine including so called 'error-codes' and possible solutions to it. In these two cases the digital service platform helped to improve internal processes at Effectiveness Co. (engineering and technical support) having the effect of using scare technical capabilities more efficiently and increasing customer satisfaction as machines downtimes were reduced.

'All the units are connected to the system- that means people in the service centre can see a default code coming in from the system and the customer doesn't even know that he has a problem.'

(Interview 3 - Provider benefits category).

From a commercial point of view several perspectives can be taken. First, the digital service platform offers new revenue streams by offering modularised service packages that can be booked in addition to any machine bought at Effectiveness Co. that is connected. Modules include different set of characteristics covering different use cases as vehicle analytics, tracking and warranty extension. However, besides the pure increase of revenues by selling such service modules other commercial routes were mentioned. Another was that due to the new possibilities of the digital service platform, new conversations with stakeholders at the client side were opened. Examples would include that suddenly one could talk about process optimization i.e. '*How can we increase the productivity of your staff with this digital function?*', whereas before it was only about technical specifications and price point of the machinery itself i.e. '*This machine has X specifications, can be delivered in Y*

months at a price of Z.'. As an explanation, according to one Effectiveness Co. informant talking about specifications leads to price-point only conversations which often have a negative impact on margin; whereas talking about process optimization which can save the client considerable costs increases the chance that price-points become less important.

It became clear in the interviews that with the introduction of the digital platform Effectiveness Co. got a totally new view on what machines are used, by whom, where, in what way exactly using that data to improve internal as well as external directed processes. Formerly Effectiveness Co. lost track of what happens to machines in the moment they were sold and delivered, the only few connections afterwards were only to machines with service maintenance contracts, however with highly manually feedback loops to gather insights.

However, the different benefits came along with numerous costs and based on several feedbacks break-even is not yet reached after approximately 12 months since the first official product launch. A fact that has high senior management attention and will be in detailed explained further down in this analysis. There are 23 references identified to occurred cost that can be clustered in technical (providing IT infrastructure), functional (staff expenditures), and other supporting costs. From a technical point of view Effectiveness Co. had to address several challenges where certain investments materialized in form of costs. On the one hand, Effectiveness Co. was missing the technical capability and infrastructural foundation to create a digital platform that could realise the intended digital service use cases. For that an external system integrator was engaged who was specialised in B2B end-to-end IoT applications from initial scoping up, programming, and implementation and lifecycle maintenance. However, to connect Effectiveness Co. machines to this platform another integrator specialised in technical data extraction, aggregation, and management was hired. Establishing the data infrastructure was taking time with several backlashes as existing solutions being replaced and new capabilities being build up. One of such backlashes was the decision of exchanging the existing telematic provider, a system that provided basic however insufficient vehicle data, which led to the point that at one point several hundred machines did not

send any data anymore. All in all, Effectiveness Co. needed to create a technology infrastructure that enables web-based applications that allowed use of internal data (data from sweepers) and their external aggregation and visualization on a web application that was hosted by a third party the IoT system integrator. This field was totally new to Effectiveness Co.

'Basically everything was new. Effectiveness Co. never had a web application developed before.'

(Interview 1 - Provider Cost to implement category).

From a functional perspective several costs incurred. Effectiveness Co. needed to provide resources to scope, implement, internally manage, and communicate the digital service platform. In the beginning some functions were using part of their time to fulfil such tasks which became later few full-time employees. A technology lead resource was one of the first and rare resources that were externally hired and 100% assigned to the project. In the due time of the project more and more functions as from service and sales were included taking over communication and trainings tasks. Such communication and training costs, costs to produce marketing material and costs to use consultancy service (to find the right price point or legal advisory to be GDPR compliant) can be classified as 'supporting costs'.

Interestingly, another type of cost materialized in the interviews which can be seen as 'cost of learning'. There were several references made with regard to learnings when engaging in the development of digital platform itself which followed an agile set-up meaning engaging in a flexible however demanding way of working when scoping, developing, and changing technical features.

Representatives at Effectiveness Co. needed time to adapt to such new ways of working. This learning process can be described as a 'learning by doing' process where decisions are made on the way (i.e. deciding on a tool feature). Besides certain 'costs of learning' another category would comprise the 'cost to transform' at Effectiveness Co. Examples include convincing stakeholders at Effectiveness Co. as sales or engineering was said to challenging and resource intensive.

For sales the newly established digital platform was in the beginning a nice to have feature which they were willing to give for free or as an add on to customers; however, this was a contrary position to Effectiveness Co. intention to create new value stream. Selling services in general is new to Effectiveness Co. sales; digital services even more and can be seen as a new way of working as people that are up to that moment used to sell high volume industrial assets (sweepers) only have to learn to cope with services with other underlying business rules (see Section 2.6.2). Sales has been used to talking about physical product features and prices in the past; to understand and convince their customers about non-physical products in form of digital services is a totally new environment to them and their peers which was stated to be highly challenging. Another point that came up associated with costs it that within the digital service platform project costs could not be so detailed planned beforehand as when engaging developing a new sweeper generation or elsewise. These cost-insecurities are seen as an element which is new to Effectiveness Co.'s senior management (see Table 16).

Table 16: Effectiveness Co. Provider Benefits and Costs Overview

Value Elements	Effectiveness Co. Provider side – *73 references*
A. BENEFITS	• **Commercial benefits:** new service as a product to generate revenue streams; competitive advantage in the market • **Processual gains:** data driven insights to make better engineering decisions; increase of technical service centre productivity • **Deepened customer relationship**: new fields to tap in from product selling to solution/process optimization conversations
B. COSTS	• **Data Infrastructure costs**: exchanging telematic system, developing digital service platform • **Implementation cost:** Program Mgmt costs • **Maintenance costs:** maintenance fee for system integrator servicing the platform • **Cost of learning:** sunk costs due to change of decisions • **Supporting cost & Cost to transform:** Communication, change mgmt. activities as trainings and workshops, legal advisory/Consulting on GDPR etc., hiring technology lead

5.2.2.3 User Benefits

From a user of the digital service platform benefits and cost perspective the following can be said. In total 79 references were identified from all interviews in case study 2 within the user benefits and cost space (see Table 17). Benefits and costs were stated by internal employees who took an internal as well as an external user perspective (see Appendix IIIc Questionnaire).

About benefits one major fact mentioned throughout numerous interviews was the increased transparency towards the bought or leased machinery users gain by using the digital platform. 'Transparency benefits' would include receiving, analysing detailed data of each machine. Examples would include specific fuel consumptions related to usage of a sweeper or elsewise and tracking as well as documenting geographical position of a vehicle to fulfil and proof certain cleaning obligations (Area X cleaned at Y Time on Date Z). In addition, another prominent benefit was to have much faster and solution-oriented actions of Effectiveness Co. technical service support in case of malfunctions, which decreases downtimes and therefore increases operational performance.

'So, I can check and control what my customers use, how they use it, when they use it, if they use it in the right way. And with that I'm talking about savings in the maintenance field…'.

(Interview 1: User benefits perspective).

5.2.2.4 User Costs

From a cost perspective, only few references were made that addressed the user. The digital capability of customers meaning that user have to be able to use the new service offerings from a technological as well as commercial point of view were stated several times. To better understand that point it has to be mentioned that most of Effectiveness Co. clientele are public organizations with traditional structures and processes and staff behind where the use of digital technologies ,such as web interfaces and integration of such, is much less common. Digital transformation of the public sector is seen as a huge challenge

and recognized in practice and academia (Mergel et al., 2019). Having a certain digital capability in place or investing in staff being capable to use the platform is one cost factor. Even if it is just one of the cost factors mentioned the impact is quite significant as it would mean that with all the benefits possible that could have positive impact on operational performance of using sweepers it could mean that this will not be interesting for the client at all as he or she has no one to use it. Consequently, this would mean that few benefits are lifted up to the point that there is no one on client side that realises the value potentials of such digital services at all.

Table 17: Effectiveness Co. User Benefits & Costs Overview

Value Elements	Effectiveness Co. User Side – *79 References*
A. BENEFITS	• **Operational gains due to increased transparency:** fleet mgmt., routing and analytics - in other words comparison fuel consumption & optimization measures. Reporting of location and activity levels of machines • **Operational gains due to better customer service:** Reduction of down times • **Fulfilling compliance/reporting demands:** documenting areas cleaned by machine • **Decreasing commercial obligation risks & maintenance risks**: reducing customer claims by digital documentation of usage/mis-usage of machinery, warranty extensions if machines is operated in certain perimeters.
B. COSTS	• **Cost of learning:** resource investment in time and/or staff to learn to use and to use the digital platform • **Cost of digital service modules:** licence fees for using the digital service platform.

5.2.3 Effectiveness Co.'s Challenge Dimensions

One major intend of the case study was to gain in-practice insights within the digitalization adoption dimension that were identified in phase 1 explorative expert interviews i.e. Vision, Business Model, People, Technology and Data, Change Management, and Financial aspects (see Section 4.6).

5.2.3.1 Vision at Effectiveness Co.

With regard to ‘vision’ in total 93 references were identified which represents 19% of all references (see Figure 52 in Appendix IIIc). Interestingly, feedback and comments on ‘vision’ was quite heterogeneously throughout the interviews.

On the one hand, the project seems to be well positioned and known within the organisation, with the main part of stakeholder seeing it now as a chance for Effectiveness Co. in general. However, that seemed to be not always the case going as far that in the beginning of the project it was kept behind the scenes with little communication going on out of the concern that it would be maybe too visionary for the broad organizational community.

‘Yes, 2017,2018 was a wild kind of period … the project was so vulnerable, one did not dare to even speak about it. It was so vulnerable; people just could not imagine it and they did not have the exact vision: ‘Where does that all lead to?’.’

(Interivew 1 - Vision category).

Other interviewees explained the digital service platform from a strong strategic perspective exemplifying the numerous potentials in ‘bright colours’. Others were focussing on more operational characteristics of the tool pointing out some technical benefits and next steps only with the big picture missing.

There were some feedbacks that there is a strong vision throughout the project and contrary to that other feedback implied that a strong alignment on vision and strategy is still missing being one weak point of the project.

There were feedbacks that reinforced that a strong vision amongst the core project members exist as an example the project initiator was highlighted as the key success factor as he forged alliances on senior management level which henceforth were key success factors to get access to budget and resources needed for the implementation.

5.2.3.2 Business Model at Effectiveness Co.

Regarding 'business model' impact 23 references were identified. The general feedback was that the digital service platform is seen as having the potential to change the existing business model of Effectiveness Co. as the digital services offered via the platform are different to Effectiveness Co.'s main business lines which are physical machinery focussed (street sweepers and others). More concretely, new products in form of digital services are offered which were not there before. These products are billed differently in recurrent models instead of large one-offs as previously existing.

There are several references that address the topic that besides the technological challenges that occurred it was a tremendous effort to design and implement the service business model and that this process is still ongoing. As a summary it can be said that Effectiveness Co. is in the position to have a technological platform in place that is working; however, with only a first set of business use cases to be commercialised.

'…until now it has been seen as a technology challenge … but in its core it is a business challenge … because we have a platform now and now we think about it: well now, where is the revenue return? But shouldn't we think about first: 'what is the right business model?'

(Interview 4 - Business Model category).

5.2.3.3 People at Effectiveness Co.

One of the main reference categories with 181 references accounting for 40% of total references was connected to 'people' with the following main sub-clusters identified as 'capability' (63 references) and way of working (99 references) leaving a rest of diverse references that were organised under a 'others' category (see Appendix IIIc, Figure 52).

Within the people capability cluster several topics were mentioned. One overarching topic in numerous interviews was the missing capabilities of Effectiveness Co. in certain fields. Examples would include providing digital

services as web applications on an externally hosted IT environment that needed to be defined, designed, programmed, and managed which was a totally new domain for Effectiveness Co. In general, a wide range of capabilities and corresponding staff functions were missing. Missing functions and qualifications ranged from web application programming, which was given externally to a system integrator, digital product ownership capabilities, meaning people in charge of deciding on what has to be programmed, making prioritization decisions as well as business development and others.

'At the beginning as the project got started no one knew really what capabilities would be really needed for such kind of projects.'

(Interview 1 - People capability category).

Realising what capabilities were needed, at what point in time, for what exactly was a lengthy learning process for Effectiveness Co. Within this process Effectiveness Co. carefully chose what resources to engage, following a risk minimizing strategy by always trying to invest the minimum possible that was necessary for the respective situation. This materialized in appointing resources part-time, leaving the number of employees to a few only which led to capacity constraints internally as well on the external programmer resource side at the system integrator. However, besides a successively ramp up of resources there was a strategic organizational tactical decision being made already in the very beginning of the project. The decision was not to place the project in the domain of Effectiveness Co. IT department, which would have been one option as considerable IT impact was expected. Instead it was decided to place it within the commercial business unit and in the after-sales service department later on. Reasons for that were numerous. On the one hand, the internal IT department even with being included in the first thoughts around the digital service platform did not see themselves in this space as wanting to focus on core system maintenance of Effectiveness Co.

On the other hand, the focus was set from the beginning to prioritise commercial service use cases meaning the scope was more commercial than technology driven.

Besides the several functional capabilities having been successively implemented there were other key success factors mentioned that were important to successfully manage the project. One was to secure the ‘way of working’ between all internal and external stakeholders involved in the project. One key element in way of working was the existence of a core project team that managed all subjects of the project ranging from scoping, stakeholder alignment, technical specifications, aligning with the external system integrator, scope prioritisation as well as product testing duties besides many others. Within the core team the project initiator and product owner was a key player, who convinced senior management to officially support the project, another key element for the project, granting budgets and managerial support throughout the project (see Section 5.2.3.1).

However, the ‘way of working’ was much more than aligning stakeholders. It was translating between newly integrated resources, focusing on the technical functionalities and business experts from sales and service, who needed to work hand in hand to realise the intended use cases but who had different backgrounds. Way of working also comprised the fact that the way products are sold at Effectiveness Co. had to be redesigned. Effectiveness Co. comes from a world of selling large physical industrial investments goods as sweepers and engages in activities to sell further digital services around such investment goods which goes strongly in consultative selling. This meant that not the product itself (like sweepers) is the primary point of discussion but the purpose behind as ‘creating clean and safe spaces’ are the ultimate objective and a sweeper is just a mean to an end.

5.2.3.4 Technology and Data at Effectiveness Co.

Regarding ‘Technology & Data’ 115 references have been identified representing 24% of total references. Generally speaking, in order to realise Effectiveness Co.’s digital service platform little of the previously existing data infrastructure could be directly used. Existing telematic infrastructures which were used to extract data from a selection of machines had to be exchanged with Effectiveness Co deciding on new external providers realizing this task.

Data flow- and analytic systems, meaning how one set of data comes to another how it is stored, how it is combined, with what other kind of data, in what visualization formats, had to be designed from scratch. This was done with the help of the new telematic provider and the system integrator programming the externally hosted digital service platform. The whole data management process, including external hosting and provisioning of necessary processes, was immensely resource taking and highly underestimated in the beginning.

But it was not only the creation of a data management infrastructure that was ready to support the use cases of the digital service platform. What came along was how to manage such data as tremendous volumes were generated with thousands of machines suddenly transmitting several terabytes of data traffic. It was the careful considerations of what data is really needed, in what format, serving what purpose, which was a new 'way of working' that can be added to the people capability category.

'In the beginning everything was downloaded what the machines could offer. Believe it or not that were almost terabytes of data. We first had to learn what did we really need … Do we really need to know the gas tank volume every half a second? Or would it be OK to have just every 30min or so?'

(Interview 3 - Data & Technology category).

Using data to do better business decision, to speed up development cycles, and optimize service operations were mentioned already in the benefits category of this case study; however, it has to be reinforced that several references were made that this approach of using data in this way just came along with the implementation of the digital service platform. This new engagement with data also included some challenges regarding legal issues being connected with such endeavours. In more detail, the data generated of vehicles like sweepers can be partly qualified as personal data and underlay certain data privacy regulations as with GDPR. Deciding what legal actions were necessary to take, what documents to be created that would support the use cases intended in the digital service platform was a main challenge Effectiveness Co. key informants shared. Legal issues caused quite intensive project management attention as well as financial resources as an external legal agency was engaged.

5.2.3.5 Change Management at Effectiveness Co.

Within the ‘change management’ category in total 24 references were identified. Change management activities were early engaged and happened on several levels of the internal and external organisation. Senior management was aligned by taking part in scoping workshops, the service department had virtual and in presence meeting with all service leads of Europe and numerous events were organised at local dealers and service partners.

Even with many activities addressed to align internal and external organization Effectiveness Co. never decided on bringing the digital service platform in a formal organizational structure and assigning full time employees on a larger scale.

‘Of course we talked to employees in formal and informal ways. We also had distribution partners here to whom we presented the digital service platform. We also have promotion videos if you come to our headquarter. However, the change management in a sense of the team behind has not changed much, this is still quite the same.’

(Interview 4 - Change Management category).

5.2.3.6 Financials at Effectiveness Co.

Within the ‘financial aspects’ category 52 references accounting for 11% of all references were identified which included for the main part business case related references (see Table 18 & Figure 52 in Appendix IIIc). Generally speaking, the main part of references addressed the tense budget situation throughout the whole project. Securing budgets in form of investments in technological functionalities or securing necessary capabilities internally and externally has been presented as a major challenge throughout several interviews.

Some key informants shared that this was due to the higher risk propensity of the project and that out of a risk averse strategy position, budgets were only freed in smaller fractions.

Others shared that this budget restrictions leave the impression that the organization including senior management does not believe entirely in the project anymore as results are behind expected business cases. And yet others stated that it is already a huge success that a project like this, which is seen as innovative and risk bearing at the same time, already got several budgets rounds approved.

However, it became clear that the budget restrictions had negative impact on project deliverables as quality of functionalities that were launched. Speed of new functionalities programmed and level of engagement of internal stakeholder groups as necessary change agents were not yet hired.

Throughout several occasions it was mentioned that at Effectiveness Co. that there is a very strong focus on commercial success metrics leaving aside positive effects that cannot be so easily measured as improving development cycles or an optimized technical support.

In more detail, this means Effectiveness Co. manages strongly on how much revenue and margin is delivered, meaning that even with a digital service platform existing with several use cases live and first customer paying, which could be seen as huge transformative task having positive side effects, this is pushed back as commercial benefits at large scale are behind expectations.

‘If you measure the success of a project only by the revenue that is generated at a customer than it is getting more and more complicated if you should have reached break-even already two, three years ago.’

(Interview 4 - Financial Aspects category).

Table 18: Internal Adoption Dimension Elements at Effectiveness Co.

Adoption Dimension	Results	Insights
01. Vision (93 references)	• Vision serves as organizational narrative • Vision content divers ranging from strategic to more operational optimization focussed content	'Vision' heterogenous throughout stakeholder groups. Key enabler to secure budget and organizational execution.
02. Business Model (23 references)	• Established as is business model heavily based on large industrial investment goods is complemented by first set of modularised digital service portfolio	New products in form of digital services are introduced in addition to existing portfolio. Digital services imply new ways of working and billing logics (recurrent vs. one offs).
03. People (181 references)	• New demands of a 'digital world' needs new capabilities priorly not existing/needed at Effectiveness Co.	'People' cluster is multi-layered. It is not just about functions and their capabilities it is about how they engage in ways of working.
04. Data & Technology (115 references)	• Existing data infrastructure not ready to serve planned digital service use cases • Data managing capability as important as infrastructure and to be redefined / learned at effectiveness Co.	Totally new approach necessary at Effectiveness Co. how to generate, manage and use data to realise intended service use cases.
05. Change (24 references)	• Change Mgmt. on several staff levels and multiple stakeholder groups as sales, service, engineering and customers	Multiple change management activities to internally and externally position the digital service platform. Change management at Effectiveness Co. does not include structural changes to the organizational structure.
06. Financial Aspects (52 references)	• Securing budget as main challenge • Organizational logic of measuring success by revenue and margin only leaves out other benefits gained.	Budget are granted on a step-by-step approach due to perceived risks and long amortization cycles. This has negative side effects on project delivery and quality and progress.

5.2.4 The Effectiveness Journey – Phases, Scope, Challenges and Learnings

Taking over the digitalization implementation phase structure from case study 1 (see Section 5.1.4) this section has the purpose of giving a chronological account of Effectiveness Co.'s transformation process (see Appendix IIIc, Table 31).

5.2.4.1 Phase 1: Need Recognition and Initiation

It was already back in 2015, three years before officially starting the digital service platform project, that several external and internal influencing factors materialized that paved the way for engaging in a service digitalization project at Effectiveness Co. From an internal perspective a new generation of electrified sweepers was developed and engineering at Effectiveness Co. asked the product, sales, and service organization for technical input about how much a certain feature will be used in the market or is currently used. In this situation it became evident that such kind of data, in other words, how machines are used, is scarce and build heavily on managerial judgment and opinion and less on hard facts and figures. It was a time where Industry 4.0 discussion was circulating meaning that on a global scale technology was seen as a mean to engage in a new industrial revolution with the help of technology in form of digitalization and with-it transforming business models. At this time several senior management discussions happened at Effectiveness Co. in this space trying to find an answer to *'What does digital transformation mean to Effectiveness Co.?*'. It was at that period when one senior management member, at that stage being responsible for sweeper product management, engaged in a university executive education program where the case of service digitalization was evaluated to be promising and which can be seen as an additional element to kick-off the project. However, on several occasions within the interviews it became clear that it was not just a technology-based motivation to think about digitalization initiatives at Effectiveness Co. In addition, it was pointed out that the market of specialised machinery as sweepers and other

equipment became more and more competitive and sales volumes and margins were more and more difficult to realise. After-sales service became more and more prominent to secure revenue growth and digitalization seen as most promising field to address this field. Interestingly, even with the general managerial discussion around Industry 4.0 and digital transformation at this time, the field of service digitalization at Effectiveness Co. has been seen critical up to a certain degree of scepticism existing within Effectiveness Co. overall organization. This scepticism seemed to origin from the circumstance that it was hard to imagine for staff and parts of management that the service digitalization, in other words non-physical offerings consisting of bits and bytes, could be a potent business opportunity for an organization that has a heritage of physical products. This scepticism forced the Effectiveness Co. management to have a close door policy around the initiative meaning that only a few selected members were actively working on potential initiative.

5.2.4.2 Phase 2: Scope Formulation and Setting the Stage

It was back in late 2017 that the digitalization initiative was officially launched being led by the product development manager of Effectiveness Co.'s sweeper business unit. Within the first months Effectiveness Co. main challenges were manifold. On the one hand, it was a complex learning process to decide on what would be a potential scope of the initiative. Several internal workshops with representatives from sales, service, IT, and other departments were held including feedbacks from different geographical markets and customers. Several consultancy firms were contacted and evaluated. At the end Effectiveness Co. management concluded that main part of the scoping and project management work should be managed internally, and that external expertise should be considered to build a digital service platform as programming expertise were missing internally. However, managing a digitalization project was new to Effectiveness Co. having a legacy of physical product engineering projects. Developing and producing physical equipment as sweepers is different in comparison to non-physical products as IT applications

such as a digital service platform with other business and realization logics. It was unclear what has to be done exactly, what kind of people to engage, and corresponding capabilities are needed for what exactly at what time for how long?

Effectiveness Co. decided on a step-by-step approach meaning that internally people from the after-sales environment were successively engaged on a part-time scale. As it became clear that IT programming skills were missing one person having experience in that field was externally recruited and working 100% on the project which was a rare exemption. Having a first initial team created and first scoping initiatives realised, several technological challenges became evident. Effectiveness Co.'s IT landscape became soon clear to be not fit for the purpose of creating a digital service platform. Challenges were manifold ranging from outdated and only partial rolled-out telematic system infrastructure. Other challenges included that the Effectiveness Co.'s IT department did not see themselves in the digitalization space having little expertise and only limited motivation to support the initiative. Due to that fact it became clear that a partner would be needed to program the technological foundation for Effectiveness Co.'s service digitalization use cases. After several evolution rounds an external partner from the IoT space was found that should provide a E2E management service of service digitalization platform.

5.2.4.3 Phase 3: Implementation and Scope Extension

After having crated a joined project development road map between Effectiveness Co. and the external partner, several project management initiatives started. Within the analysis of the existing IT infrastructure at Effectiveness Co. it became clear that new telematic and data management infrastructure was needed, and corresponding activities started that led to abolition of the existing telematic legacy and implementation of new one. This heavy IT architectural generating was getting even more complex with definition and implementation of data management systems. Bringing data from the machines to externally hosted so called cloud IT application was a heavy undertaking which that was underestimated in terms of resources and time

needed in the beginning. Within the process Effectiveness Co. needed to adapt their way of workings in several ways. It was not just a new technology but how to define, implement, and later manage this technology. Effectiveness Co. representatives realised in a steady learning curve that scoping and implementing service digitalization activities was different to descoping and implementing a new sweeper or other specialised machinery. Digital technology had other way of workings as 'agile' development methods meaning that developing a digital product and its specifications was flexible often undertaken in parallel with other activities having several iteration loops until a minimum viable product (MVP) was created meaning a digital functionality that is delivering a certain functionality that can be realised by the end customer. This was in contrast to Effectiveness Co.'s as-is project management that appeared in the interviews to be more waterfall-oriented principle meaning that there were clear-cut phases as scoping, design, production and little to no iterations around them. Once the scoping phase was finished you cannot go back. Effectiveness Co. learned such new working methods on the fly with the core project members in charge being flexible and motivated that acted as an interface to translate such new ways of working to the rest of the organization.

Technological challenges were just one side of the coin. With the first use cases materializing, being heavily build on data that was sent from sweepers to the service platform, it became evident that certain legal issues had to be dealt with. Legal considerations ranged from:

'Are we allowed to see the data from a machine that does not belong to Effectiveness Co. anymore (as it was sold)?' to '*What technical as well as contractual considerations have to be taken into account to comply to data privacy regulations as GDPR?'* or *'What do our customers need to sign that we as Effectiveness Co. are compliant and will they want to sign such things?'.*

Legal considerations have been pointed out as one of the major challenges that were heavily underestimated in the beginning of the project. Effectiveness Co. engaged an external legal agency to deal with that and all challenges were addressed; however, with huge timely efforts and additional budgets (see Section 5.2.3).

5.2.4.4 Phase 4: Scaling and Formalization.

After 1.5-2 years of developing the digital service platform Effectiveness Co. launched the digital service platform in early 2021. Besides the technological basis several initiatives were managed in parallel in order to make that happen that range from pricing consideration for such service modules, training activities for sales and service, as well as communication initiatives.

One major challenge for Effectiveness Co. was to find the right service proposition to be commercial offering including the pricing model. Now that a technological platform existed, having several technical functionalities at hand, Effectiveness Co. was occupied with answering questions *like: 'What would be customers be willing to pay for?', 'How do we package that in what kind of service products?', 'Who will be selling it how and what do we need to do after that if that happens?'*.

In this phase it became clear the number of technological questions was now supplemented by commercial challenges that seemed comparable difficult to solve for Effectiveness Co. Within the interviews it became clear that the commercial component, meaning what digital service products are sold at what price by whom, was underestimated in complexity and scope within the project and is still seen as a key challenge within Effectiveness Co. To answer these challenges Effectiveness Co. engaged an external marketing agency specialised in pricing to support the decision-making process on price points and commercial aspects. Effectiveness Co. appointed new internal staff to deal with trainings aspects, communication, and general promotion activities to push the service digitalization portfolio within sales, service, and the external dealer environment. There were several supporting decisions made to provide the technological basis on a much broader scale as every new produced sweeper and other machinery is provisioned with the technical module that connects the machine to the digital service platform. However, even with such technological decision made and service platform functioning being live and receiving good feedback, it was mentioned on several occasions that volumes in terms of service modules sold are behind business case expectations. Explanations for that have been pointed out throughout the interviews. Some mentioned that

much longer time is needed to convince internal sales and service to sell the product. Other feedbacks included that even a new type of ‘seller’ profile is needed in sales as existing sales personal might be too much used to physical machinery as they always that having different pricing and selling logic as digital services. Others mentioned that customers would need longer to adapt as well as this is new to them and that they cannot grasp what digital service means. In addition, it was pointed out that new stakeholders might be necessary to be talked with meaning that today Effectiveness Co. sales is talking to procurement on the customers side but might need to talk to decision makers who deal on the customers side with process optimization challenges where digital service modules could be of help. All in all, it can be said that scaling volumes on the existing service platform is at the core of Effectiveness Co. thinking, even more as critical voices seem to become more apparent as business case numbers are not yet delivered as envisioned.

5.3 Summary In-Depth Case Studies

Several key insights from practice were covered in this chapter by engaging with stakeholders from two corporate B2B organizations having implemented two service digitalization offerings, one targeting efficiency benefits the other effectiveness.

First, influence factors from the literature review chapter were confirmed and complemented whenever necessary (see Section 5.1.2.1 & 5.2.2.1).

Second, identified benefits and costs in B2B service digitalization in Chapter 4 were enriched with real-life examples (see Section 5.1.2.2, 5.2.2.2 & Table 32).

Third, previously highlighted challenge dimensions were enriched with two real-life company cases including a project development perspective by identifying four implementation phases i.e. need recognition and initiation, scope formulation and setting the scene, implementation and scope extension, and scaling and formalization (see Section 5.1.4 & 5.2.4).

All findings are critically reflected and discussed with the literature (see Section 6.2 & 6.3).

6 OVERALL DISCUSSION

This discussion chapter will summarize the findings of the primary research activities in this DBA project (Expert interviews and case studies) and reflect it in line with extant literature. As a result a set of propositions will be presented that will be structured along the outlined research questions (see Chapter 3 & Section 3.5). In addition, a service digitalization relationship value framework will be proposed that combines key elements of this research project (see Figure 39).

6.1 Discussion of Explorative Expert Interview Results

The objective of the interview series was to answer the following two research questions:

RQ1: What is the potential of service digitalization in B2B relationship management?

RQ2: What factors influence the value in practice perception of service digitalization in B2B relationship management?

A full series of elements answering these questions were provided in the explorative interview sections and will be discussed within in the literature leading to detailed propositions.

6.1.1 Different Service Digitalization Paths

With regard to RQ1 and the potential of service digitalization, various fields were identified and explained in detail in sections 4.2 and 4.3, ranging from generating elements towards efficiency (making processes faster, more reliable, cheaper, etc.) to effectiveness measures directed at innovation, meaning creating new product and/or service solutions with the help of digitalization. However, the potential benefits of digitalization do not come without a cost, which include investments in technology – as infrastructure, processes, tools,

and software – as well as costs associated with the process of transforming and changing the current operating model (see Section 4.4).

Findings from the interviews that the term ‘digitalization’ is differently understood has been highlighted in numerous occasions in academia and practice. Pagani and Pardo (2017) concluded that digitalization and digital transformation may in certain cases appear unclear for B2B employees and B2B managers. They suggest that a translation for non-IT experts would be helpful to make such concepts easier understood by connecting such terms to language known in their environment. In this respect Pagani and Pardo (2017) propose that digitalization can have different effects on different levels. Such levels could be the optimization of existing business activities, combining new resources that can create new activities, as well as creating new activity bonds between actors. However, it has to be acknowledged that heterogeneous use of digitization and digitalization is not a solely an in-practice phenomenon. The terms are often interchangeably used, combined, and adapted in academia as well as presented in the works of Rodrigues (2020) that identified 16 definitions of digitalization within a systematic literature review of 442 articles emphasizing the blurriness of the term digitalization. Srai and Lorentz (2019) support this by stating that much of the literature around digitalization appears to be ambiguous as an exact definition of the term is missing due to the probable elusiveness of the topic.

Besides a heterogenous usage of terminology in field of digitalization there have been calls in the literature to have a more fine-grained approach on as some authors use digitization synonymously. The difference might be just two letters but the difference in meaning is vast. Brennen and Kreiss (2016) state that:

‘Digitization and digitalization are two conceptual terms that are closely associated and often used interchangeably in a broad range of literatures. There is analytical value in explicitly making a clear distinction between these two terms.’

(Brennen and Kreiss, 2016; p. 1).

Based on analysis of existing literature and contemporary web entries Gobble (2018) supports the basic distinction proposed by Brennen and Kreiss (2016)

that ‘digitization’ is the process of converting analogue information to digital. This is also in line with findings from the interviews that the management of data is an essential and central point. ‘Digitalization’, on the other hand, refers to the use of digital technology to create new value streams (Brennen & Kreiss, 2016). Gobble (2018) explicitly points out that ‘digitization’ does not disrupt fundamental business strategies nor drives new business models as digitalization can do. This academic perspective is in line with a definition of digitalization and digitization from digitalization practitioners forums and website as by i-Scoop.com (2016) that state that:

‘While digitization is more about systems of record, and increasingly systems of engagement, digitalization is about systems of engagement and systems of insight, leveraging digitized data and processes.’

Discussions on digitalization and digitization have been echoed ever since in different academic and practice domains. Examples from the IT-practice would comprise Gartner Glossary (2021a) that states for digitization:

‘Digitization is the process of changing from analog to digital form, also known as digital enablement. Said another way, digitization takes an analog process and changes it to a digital form without any different-in-kind changes to the process itself.’

And for digitalization Gartner Glossary (2021b) states:

‘Digitalization is the use of digital technologies to change a business model and provide new revenue and value producing opportunities.’

To get a more holistic picture of the digitalization environment and terms used the term ‘digital transformation’ has to be included in the discussion as it often appears in the context of digitalization being as well used interchangeably (Pagani & Pardo, 2017).

Similar to ‘digitization’ and ‘digitalization’, ‘digital transformation’ is an ambiguous used term that is mostly associated with the necessity to use new technologies to stay economically competitive in the internet age, where products and services are increasingly delivered offline and online (Mergel et al., 2019). Gong and Ribiere (2021) identified 31 definitions of digital

transformation based on 134 articles analysed pointing out numerous challenges within the proposed definitions (i.e. conflation problems, conceptual stretching, and missing conceptual clarity). They identified six so called ‘primitives’ with connected core attributes that should define ‘digital transformation’ as a term which are: nature (change & process), scope (radical, fundamental, significant), target entity (organization, business network, industry), means (resources and capabilities), expected outcome (improvement, change in innovation), and impact (stakeholders as customers, employees, partners). By integrating these primitives Gong and Ribiere (2021) propose to define ‘digital transformation’ as:

‘A fundamental change process, enabled by the innovative use of digital technologies accompanied by the strategic leverage of key resources and capabilities, aiming to radically improve an entity and redefine its value proposition for its stakeholders. (*An entity could be: an organization, a business network, an industry, or society).’*

(Gong & Ribiere, 2021; p. 12).

The definition proposed by Gong and Ribiere (2021) is in line with other recent academic contributions as by Mergel et al. (2019) that also highlight the transformative character of digital transformation. They make five propositions what a definition of ‘digital transformation’ should include, similar to the primitives proposed by Gong and Ribiere (2021) i.e. Proposition 1+2: digital transformation needs a change trigger/scope, Proposition 3: digital transformation touches numerous capabilities/conditions of an organization, Proposition 4: digital transformation has an interactive character, Proposition 5: digital transformation is of ongoing character of recurrent revision.

Due to the consistency of elements within the definition of Gong and Ribiere (2021) with other sources as Mergel et al. (2019), as well as sources from practice as Bloomberg (2018) that also defines ‘digital transformation’ as a cross-cutting organizational change endeavour of implementing digital technologies, the definition of Gong and Ribiere (2021) will be adopted for this thesis.

To clarify terminology around digitalization for this research project the following definitions are made. ‘Digitization’ is the process of converting analogue data in digital information providing the very foundation for digitalization. ‘Digitalization’ in turn is the new form products, services and processes can take to generate value with the help of data and digital technologies. This form can appear on different levels from basic to complex, impacting efficiency and/or effectiveness. Finally, ‘digital transformation’ is the change process on a broader scale clueing together digitization and digitalization endeavours touching the internal and possibly external organisation (see Figure 29).

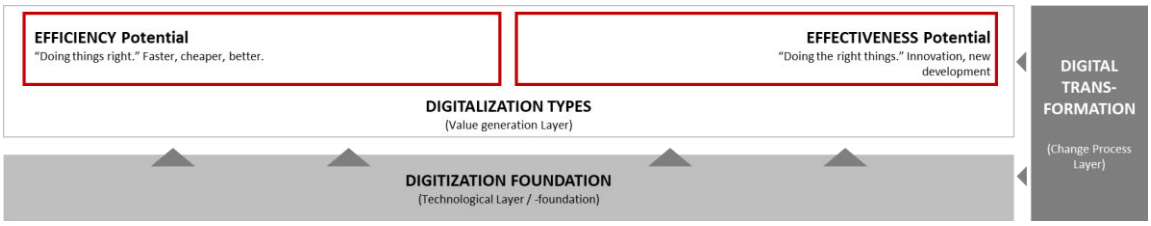


Figure 29: Digitization, Digitalization, and Digital Transformation Visualization

Besides the different and sometimes ambiguous use and understanding of terminology in the literature the interview series also identified that companies are on a different level of ‘how’ they could digitalise and to ‘what’ extend they see potential in digitalization. Consequently, it is not just an issue of using the right terminology but to understand what the potential of digitalisation really is.

Similar to the identification of Type 1 companies (having a narrow definition efficiency only view of digitalization) and Type 2 companies (having a broader efficiency and effectiveness understanding) within the interview series (see Table 9). Laudien and Pesch (2019) identified four business model digitalization archetypes i.e. digital beginners, customization focussed firms, distance bridging firms and full-scale digital firms.

‘Digital beginners’ were characterized that digital technologies are not contributing to value generation in a significant way and that digital technologies are seen as a potential replacement of analogue technology only.

‘Customize focused’ firms utilize digital technologies to identify and fulfil customer wishes and needs as online delivery status services etc.

‘Distance bridging firms’ are defined by using digital technologies to bridge geographical distance i.e. that a product is marketed over several geographic regions with adaptations as language settings.

‘Full scale digital service’ firms were characterized by Laudien and Pesch (2019) that value creation is entirely digital, working heavily with freelancer having no standing core team of employees.

It can be argued to what extend exactly the findings of Laudien and Pesch (2019) can be applied to B2B, as their study had a B2C focus; however, as organizations in B2B and B2C are similar some elements are potentially valid as well in B2B (Kumar & Raheja, 2012). What becomes clear from this study and the conducted interviewees is a notion that there is no standard how digitalization is materializing or how it can be applied. Digitalization comes in different forms from basic to sophisticated functionalities, touching different dimension of organisation and with-it making things (just) more efficient or creating new elements up to changing whole business models.

Besides the different possible roles digitalization can take there seems to be missing knowledge of what different potential digitalization can have. Therefore the following proposition as a first outcome of this research project is proposed.

Proposition 1:

There is a heterogenous level of understanding of and within B2B organizations towards:

(i) What digitization, digitalization, and digital transformation really means and

(ii) What digitalization paths exist in service digitalization

In general, B2B organizations can consider two main service digitalization paths: One aims for efficiency gains by ‘doing things right’, while the other is effectiveness-driven, doing the right things. Both are not always clear-cut and can have overlaps.

6.1.2 Benefits of Service Digitalization

With regard to RQ2 and what influences the value in practice perception of service digitalization, various fields were identified within the expert interviews (see Section 4.1 - 4.6). Depending on numerous internal and external influencing factors, as outlined in section 4.5, decisions about digitalization are a complex and unique endeavour with few generalizations possible. This is because these decisions always depend on the company, its internal and external situations, and the intended scope and availability of resources as well as how benefits and costs of digitalization are perceived.

From an academic perspective the following remarks can be made on benefits of digitalization. Interestingly, having conducted a key word search on benefits of digitalization as part of the initial literature review there was no direct link or holistic list of benefits found. Research that included benefits of digitalization were scarce and benefit content hidden. Moreover, benefits were not directly mentioned in articles but included in high-level constructs as impact-, potential or value of digitalization with some sources even highlighting that their approach is very generic (Parviainen et al., 2017).

Regarding relationship digitalization Salo et al. (2020) identified several dimensions, or ‘characteristics’ how they called it, on which digitalization can occur in different forms within a B2B relationship. The first dimension comprises the product and service level meaning how are products and/or services constructed and delivered. According to Salo et al. (2020) several degrees seem possible starting from physical constructs having only few digital supplementary elements as digital brochures. However, products can have larger digital components, as well as physical ones, up to settings where the product is entirely digitized.

Such benefits of digital characteristic are not new to academia. Already back in 2006 Ulaga and Eggert (2006) identified benefits as part of their B2B study on business value. Tzempelikos (2020) undertook a more recent study in the same area supporting findings from Ulaga and Eggert (2006). In addition, Tzempelikos (2020) states that besides benefits in the core product and service

offering, benefits can also be lifted in the actual buying or sourcing process itself, as well as customers operations after the sales and delivery phase. Ulaga and Eggert (2006) found out that such benefits are nearly four times more important than the underlying costs. When replicating the study, Tzempelikos (2020) found out that benefits are even ten times more important than costs. According to their analysis Tzempelikos (2020) state that cost competitiveness is a necessary but by no means sufficient prerequisite to differentiate in a business market and that digitalisation plays a more and more increasing role in such exchanges.

Salo et. al. (2020) takes up this increasing role of digitalization more specifically in B2B relationships pointing out that it can happen on several dimensions often starting with digitizing the information flow process with the help of information extranet (Spralls et al., 2011), extended enterprise resource planning (ERP) systems (Gupta et al., 2019), or additional mobile operating systems (Barata et al., 2018). Due to the creation of such digital technology enabled infrastructure and digital communication running on this layer, relationships become more digitized with the potential of being more efficient. However, according to Salo et al. (2020), besides such benefits or 'virtuous cycles of digitalization' how they call them, the opposite exists as well. As such, digitalization can have a negative impact to the buyer-seller relationship up to a level that it has to be stopped or even reversed i.e. a 'vicious cycle' that can occur when expectations are not met. One key element seems to be about managing benefits and costs along efficiency and effectiveness levels or as Salo et al. (2020) puts it:

'The virtuous cycle occurs when companies can effectively and efficiently use information technology to speed up processes and yield the benefits of digitalization. The vicious cycle occurs when expectations of digitalization efforts are unmet.'

(Salo et al., 2020; p. 6).

As a summary it can be said that benefits in service digitalization can be differentiated in efficiency and effectiveness paths (see Section 4.2 & 4.3). Such benefits can be lifted in different ways and can be differentiated in categories as

digitization, digitalization, and digital transformation (see Figure 29 & Verhoef et al., 2021).

Within ‘digitization’ the transformation of analog to digital data could create new information, enabling new products with new features, and potentially reducing costs ((Vendrell-Herrero et al., 2015; Øiestad & Bugge, 2014).

Based on digitization, ‘digitalization’ could connect customers and firms as within ERP-, CRM- and UCC platform approaches (Pagani & Pardo, 2017; Salo et al., 2020). In addition, machines can get connected within IoT settings (Lenka et al., 2017); restructuring and connecting processes in order to create new opportunities (Ho & Lee, 2015). Finally this could lead as well to improve product- and process quality (Kompalla et al., 2017; Li et al., 2016).

‘Digital transformation’ could use digital technology to facilitate change i.e. implementing change portals, communication loops within the organisation (Agarwal et al., 2010); as well as changing roles between competitors, customers and the company i.e. using clients as co-creators for product and service design (Parivainen, 2017; Karimi & Walter 2015). Furthermore, the creation of new business models and -opportunities (Andal-Ancion et al., 2003; Salo, 2020), as well as changing the firm’s value network is mentioned i.e. integrating resources and capabilities with the help of digital technologies (Schallmo et al., 2017).

Proposition 2:

Expected benefits are important factors to engage in service digitalization activities. Benefits in B2B service digitalization are numerous and can be clustered along the efficiency (doing things right) and effectiveness (doing the right things) dimensions. Most companies objective for efficiency benefits, as they are supposedly less complex. However, some companies start with efficiency benefits and develop effectiveness benefits later when there are more digitally mature.

6.1.3 Costs of Service Digitalization

From an academic perspective many of the cost elements identified within the interview series have been echoed, even though scattered, among different disciplines; however, often within a B2C context. Already back in 2006 Zhu et al. (2006) stated that the rapid increase of digital network technologies holds the promise of reducing communication costs as firms are migrating towards internet technology based digital platforms that can be seen as a primary driver of productivity, in other words efficiency increase. There has been ever since an indication that the integration of technologies as within digitalization can have benefits on several dimension. Such benefits would materialise as lowered procurements costs with the implementation of digitized processes instead of paper, reduced cycle terms of service, and/or product deployment leading to enhanced firm's performance (Barua et al., 2004; Vuori et al., 2019). However, to lift such cost-reduction associated benefits investments in digital infrastructure and their adoption are one main factor. With regard to infrastructure companies still really heavily on IT legacy systems that increase the complexity of change and cost of systems adaptation (Monaghan & Bass, 2020; Zhu et al. 2006). A fact that is in line with findings in the interviews where 'technological depts' and adaption cost were mentioned.

There is a general acceptance in the literature that investments in digitalization are vast, with more than challenging implementation- and sub-sequent integration efforts. There is some evidence that the direct relationship between performance and digitalization is not linear and rather complex meaning that investment costs do not necessarily pay back in the short term (Kohtamäki et al., 2019). Gebauer et al. (2020) state that:

'…despite revenue enhancement through digitalization, companies often face a digitalization paradox: They invest in digitalization but rarely seem to achieve corresponding revenue enhancement. This paradox differs from previous discussions on the productivity paradox, which focused on cost and productivity improvements rather than revenue enhancement.'

(Gebauer et al., 2020; p. 322).

Hence, despite promising benefits leading to significant financial potentials, companies struggle to lift the value promised by digitalization. In this respect, the mere investments in digital technologies seem to be not sufficient and greater challenges are faced when it comes to organizational capabilities and practices to take advantage of such digital systems (Kohtamäki et al., 2020). Building up such digital capabilities can be manifold as enabling all roles along existing value chain within an organisation as research and development, service and product management, sales, supply chain, and service management (Kohtamäki et al., 2020). Others would be supporting functions as human resource management, finance, and change management project teams (Kim et al., 2005; Porter & Heppelmann, 2015; Wessel et al., 2021). Even when having successfully implemented digital technologies, new digital systems often require new skills sets and competencies in using such system which in turn requires additional coaching and training which are additional cost factors (Bag et al., 2021; Brynjolfsson & McAfee, 2011; Wamba et al., 2017).

Besides the mentioned direct costs associated with digitalisation (Hardware, Software, capability investments) there is a notion of a less obvious cost category that comes along with cumbersome technology infrastructure called ‘opportunity costs’. ‘Opportunity cost’ can be described as the alternative use of certain amount of resources when deciding whether to invest resources on a certain case, hence the foregone benefit of an alternative option not chosen (Persson & Tinghög, 2020; Spiller, 2011). With respect to the field of digitalisation such opportunity costs considerations would include costs of an intended digitalisation measure against possible alternative use of such investments. Such investments are rarely one-time investments but more of an ongoing character as with constantly and faster changing product and service portfolios the dynamic adaptation of (digital) system that support all that is necessary (Hill, 2012). Consequently, companies considering activities in the digitalization domain will consider how big are their specific alternative opportunities and maybe refrain from investing in that domain.

As a summary it can be said that the cost elements on user- as well as provider side can be found in the literature however scattered around different research

projects and disciplines. There is a notion that costs should differentiated in technology associated i.e. IT investments and non-technology associated costs as change management-, and capability costs. However, it appears important to see it as whole and not limiting the cost discussion to the internal organisation only as costs can occur on the clients side as well (Mingione & Leoni, 2020; Rusthollkarhu et al., 2020 & Table 11).

Based on the interviews conducted and a subsequent literature review this research project provides a more holistic oriented summary of costs in the field of B2B digitalization which to the best knowledge of the author has been provided in the literature or practice (see Table 11).

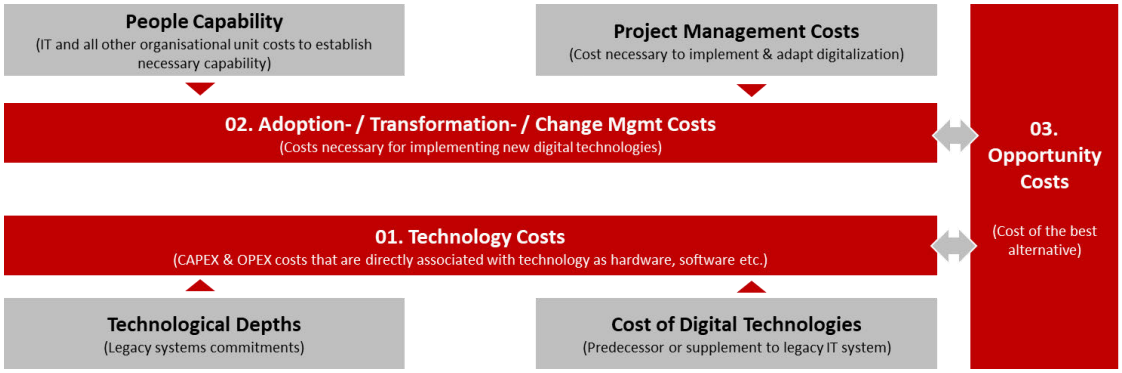


Figure 30: Cost to Transform - Visualization of Digitalization Associated Cost Dimensions

In addition to the cost categories presented, this research project proposes that costs associated with digitization, digitalization, as well as digital transformation can prevent companies to engage in digitalization activities as identified within the interviews. This seems an important statement to make as numerous studies imply that engaging in digitalization is without no alternative and a more reflective approach, meaning that there are downsides, is to be preferred (Zierer, 2019). There is little research found on the topic of digitalisation avoidance beside a recent article by Magusson et al. (2021) in which it is stated:

'As digital transformation is cumbersome and associated with risk (as is any change in an organization's value streams), it is only natural that organizations and their employees develop and use strategies to counteract transformation.'

(Magusson et al., 2021; p. 1).

In their article on digitalisation resistance Magusson et al. (2021) state the following four reasons for digitalisation avoidance i.e. ‘protection’, ‘refutation’, ‘deflection’ and ‘repudiation’. According to Magusson et al. (2021) companies might ‘protect’ and shield their organization against digitalisation when digitalization is viewed as a threat or risk an associated costs factor hard to overcome for the organization.

‘Protectionist’ strategies can appear in various forms editing or filtering content on digitalisation with the purpose that organizations shy away from potential deficiencies in practice with the purpose of possibly safeguarding their organisational identity.

‘Refutation’ would comprise that certain messages, in this case change potentials of digitalisation, are adjusted so that an alternative depiction is created in which the current strategy or business model of a company remains unaffected. According to Magusson et al. (2021) strategies of refutation would include to ignore, deny, or argue against depiction of digital transformation.

‘Deflection’ strategies would consist of emphasizing an expressed commitment and ambition of digital transformation being portrayed to external audience of a company, but which are not at all reflective of what is really happening within the respective organisation. Such forms of so called ‘digital window dressing’ seems to be quite common as identified by Nell et al. (2021) that found out that companies embark within ambitious IT projects however with slim chance of realising actual digital transformation benefits or that digitalization can change strategies and organizational structures not in the anticipated direction and therefore leading to negative impact.

‘Repudiation’ within a digitalization context would include the dismissal of new technologies in daily routines of an individual or an organization as well as an even broader denial or ignorance of the risk of disruption as something not related to the specific organization and/or individual (Magusson et al., 2021). Schmid’s (2019) digital transformation case study on a western European mobility provider is one example where it is exemplified that employees were actively boycotting digital transformation initiatives as they were changing their daily routines and practices.

For this research project it can be stated that the aspect of costs in digitalization is a manifold construct (see Table 11). Even with costs being considered in multitude of studies among different disciplines no holistic list as presented in this research project has been provided in academia and practice and is therefore seen as one contribution of this work (see Figure 33).

Proposition 3:

Costs in B2B service digitalization projects are manifold and can be seen from different angles. It concerns more than simply investments in technology and can be clustered in:

(i) Costs of technology,

(ii) Adoption–transformation and change management costs, and

(iii) Opportunity costs.

The combination of benefits and costs influence a company's decision to invest in service digitalization paths.

6.1.4 Influencing Factors of Service Digitalization

In the literature influencing factors are a well-studied area when it comes to technology adoption. Within his analysis of 197 research projects on B2B e-commerce diffusion and adoption, Sila (2015) identified underlying four influence factor categories i.e. Technological-, Organisational- (internal), environmental (External), and interorganisational (External) factors as a structure. These factors are similar to the TOE-Model by Tornatzky and Fleischer (1990), which has been covered in section 2.4.2.

A more recent study within digitization and digitalization environment on big data adoption by Sun et al. (2020) used similar adoption categories supporting the use of such structures and categories to engage in technology adoption analysis as within this research project.

The 'technological context' is seen as a multi-layer construct in the literature (Asare et al., 2016; Kline 1985). On the one hand, one layer is the technology

employed to support business operations in form of physical infrastructure which would be hardware elements as servers, desktops etc. in the IT domain on which processes are run with the help of specified programs as software (Asare et al., 2016). Companies are more likely to adopt such technologies if the relative advantage of such technologies promise technological competence to outrun the benefits of existing technology employed (Premkumar & Roberts, 1999; Zablah et al., 2005). Technology in this respect can be manifold and complex and there is literature that states that the increasing use of technology is negatively affecting technology adoption in companies (Asare et al., 2016). However, there is an indication in the literature that there is more to technology than considering new hard- and software itself when it comes to adoption. Lin and Ho (2009) state that new technology must be compatible to existing technologies to lift benefits. In this context technology adoption can be seen within a more organisational context as a change in technology can change organizational processes, managerial practices, and culture being affected by it (O'Callaghan, 1992; Ramaseshan et al., 2015).

As an organisational context 'technological competence', sometimes also referred to as 'technology readiness', can also influence the intention and the success of technology implementation (Ramaseshan et al., 2015; Wang et al., 2010). The technology competence of an organization includes factors like technology skills and knowledge as well as certain attitudes towards the technology (Kuan & Chau, 2001). In this respect, organizations might have newly acquired technologies in place, having even secured the technical compatibility, but in order to lift the intended technology potentials more elements are needed. Such elements would include professional knowledge, skills, and expertise forged within a change management (Lee et al., 2014; Sun et al., 2020; Vidgen et al., 2017). Within the organizational context of people, literature also highlights the role of senior management when it comes to adoption. Gupta and Georges (2016), as well as Lee et al. (2014), state that senior management, such as Chief Digital Officer (CDO), becomes a key change management role that facilitates and promotes the use of new technologies within the organization. However, technology adoption seems not to be bound to some single roles as the CDO. Several studies propose that the

support of the whole top management is vital to secure as well as to facilitate the willingness of senior management, and further management level down, to encourage change and to allocate resources to the prospective change (Hult et al., 2007; Sila, 2015). In this respect, Rogers (2010) states that in a technology adoption context, the fastest rate of adoption is driven by authority decisions helping facilitating change process when senior management is motivated creating a positive environment (Martins et al., 2016).

Similar to the technology and organizational context the 'environmental context' can be seen from different angles and consists of different levels and elements. Industry competition and different competitive pressures within is one of the key elements within environmental context discussed in the literature (Sila, 2015; Sun et al., 2020). Competitive pressure can be understood as external forces that push companies to adopt a new technology and/or to engage within a change in comparison to their current status-quo (Obal, 2017). Firms tend to have higher adoption rates on new technology to boost their technology advantage even more when they experience fierce competition (Zhu et al., 2006). In this respect, the concept of 'mimetic pressures' is mentioned in the literature meaning that firms within the same industry are being pushed to imitate the actions. In this case technology adoption of the industry leader or other players in the industry try to achieve competence parity due to higher market pressures (Huang et al., 2022). Many firms seem to be motivated to pursue similarities with organizations they consider to be their benchmark to avoid appearing different to others in the same environment (Radaelli, 2003; Abrahamson & Rosenkopf, 1993).

However, the environmental dimension goes far beyond the industry or sector of an organisation. Elements outside the industry could be the regulatory environment that could encourage, as well as limit certain technology adoption and their use by providing legal environment, support but also regulatory directives (Zhu & Kraemer, 2005). One example would be that government could allow legal measures to be implemented to address concern of audiences regarding information illegal data trading, data leakage than can be a barrier, as well as a facilitator for technology adoption (Sun et al., 2020). One of the most

prominent examples in the field of digitization and digitalization would be the European Union (EU) General Data Protection Regulation (GDPR), which is seen as a landmark in EU privacy regulatory framework protection privacy data of individuals and firms as well as forcing companies to implement data privacy standards when being active in the EU (Campanile et al., 2021; Goddard, 2017).

Besides regulatory effects there are other environmental impacts that can affect technology adoption in general and specifically in the B2B environment. Literature indicates several spill-over effects from the B2C on B2B which became known under the term ‘consumerization’. Consumerization can be summarized as the change of buying behaviour in B2B, based on developments within the B2C environment (Lilien, 2016). As all B2B professionals are private consumers experiencing digital innovations in their private environment as with amazon.com, booking.com, or Airbnb - just to name a few - they take over experiences and habits gained in this domain to their professional environment, expecting similar solutions (Heinemann, 2019).

The global COVID-19 pandemic is another example how an environmental factor can influence technology adoption. COVID-19 has caused dramatic effects on people business activities and therefore the world economy. Due to the restrictions of COVID-19, where government imposed strict isolation and minimal physical contacts over months, people as well as organizations have been forced to implement new ways of living and working with a strong pressure to make use of digitalization to offer services and products (Almeida et al., 2020). There are several studies that state that the pace and repercussion of technology disruption and increased use of digitization, digitalization, and digital transformation in organization as well as public entities has been massively accelerated by COVID-19 (Almeida, 2021; Almeida et al., 2020; Kutnjak, 2021).

COVID-19 is one example, where a sudden effect forced an abrupt shift from analog interactions and face-to-face contacts to digital formats. Even with the notion that this move to digital is being celebrated as some kind of silver lining of the COVID-19 breach, at the same time several downsides became apparent (Faraj et al., 2021). Besides positive shifts to digitalization, as for example in

telehealth to provide service more efficiently, a recent US study found out that this can have discriminatory effect on populations with no or uneven access to digital infrastructure creating access hurdles creating some kind of ‘digital divide’ (Ramsetty & Adams, 2020). Other challenges of digitalization in the COVID-19 pandemic were that public and private organization were forced to change their way of working processes in response to the pandemic implementing unified communication and collaboration solutions as video conferencing etc. Zoom, an internet communication platform, saw skyrocketing it user account from 10 million in December 2019 to over 200 million in March 2020 (Yuan, 2020). As many companies and organizations like universities and people like employees, students, as well as professors found that these online meeting and courses faced many difficulties. Suddenly inadequate internet bandwidth, firewalls settings, lack of using the tool, or adapting presentation skills to the new format became apparent (Faraj et al., 2021). Such examples support the previously made point that technology alone will not exploit its full potential if supporting elements as the existence of necessary capabilities and skills are present, and adequate transformation change measures are met.

For this research project it can be stated that influencing factors of B2B digitalization are manifold as it has been the case with benefits and cost in the previous chapters.

Proposition 4:

Influencing factors of B2B service digitalization are numerous and can be clustered into internal and external factors with corresponding sub-categories.

Sub-categories include environmental and relationship types, underlying product and service complexity, process- and technology-related factors, and sector-specific factors known from the technology adoption theory as TOE. Additional factors include a company’s investment cycle, place in the digital maturity curve, digitalization expectations, and understanding of digitalization paths.

6.1.5 Interconnection of Digitalization Challenge Dimensions

Within the explorative expert interviews, six challenge clusters were identified: vision, business model, people, data and technology, change management, and financial aspects (see Figure 31). Despite the fact that each category is identified without a direct connection to the others and a one-by-one presentation in previous sections, they should not be seen in isolation (see Figure 32).

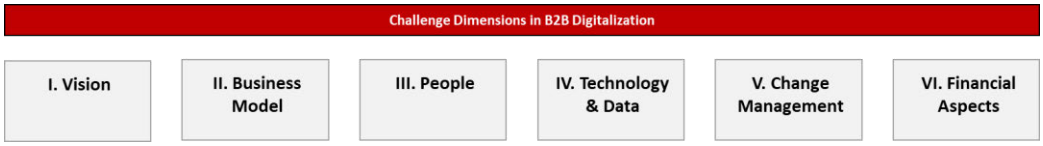


Figure 31: Challenge Dimensions in B2B Digitalization

It can be argued that vision is an overarching element under which all other elements are subsumed. Furthermore, a change in business model must take into account the effect on people who ‘bring life’ to organizational procedures with respect to current and future capabilities needed. A similar approach can be taken for the technology and data category, which is a central enabling element in digitalization to realize certain future states that are envisioned in the vision and are further described in adaptations of the business model.

The change management dimension can be seen as a facilitation vehicle, meaning that, to move from a vision to future expected outcomes such as service revenue generated by a new or adapted business model, change management activities bring together all necessary factors within a defined process to facilitate the transition from one organizational state to another.

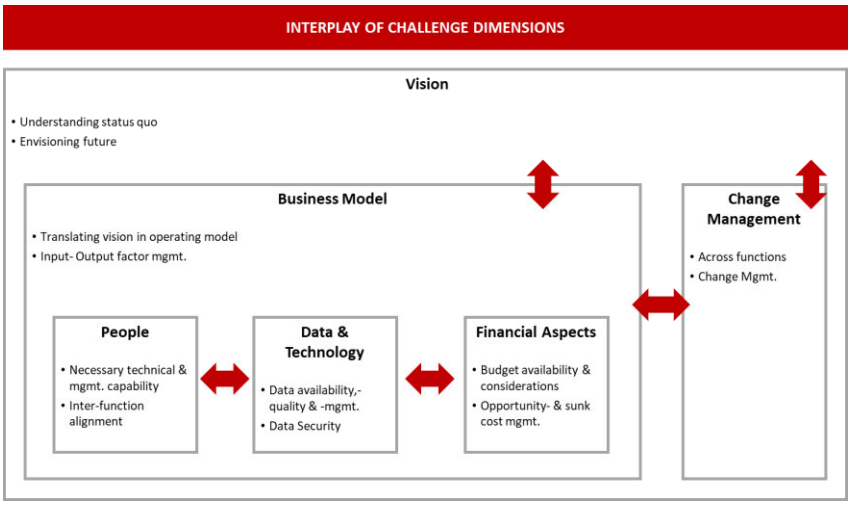


Figure 32: Proposed Interplay Between Digitalization Challenge Dimensions.

Proposition 5:

There are six main challenge dimensions in B2B service digitalization of which companies must be aware: vision, business model, people, data and technology, change management, and financial aspects. Each dimension has specific characteristics to be addressed. In addition, dimensions must be seen in correlation with each other, not in isolation.

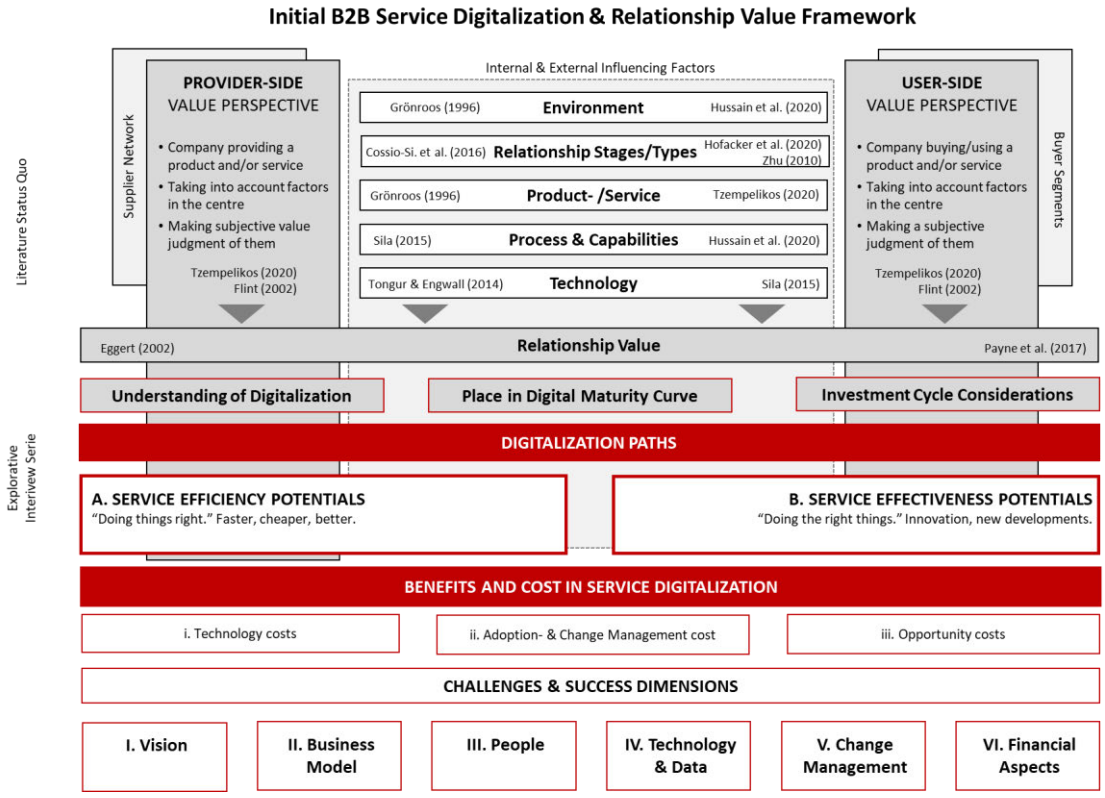


Figure 33: B2B Relationship Value, Digitalization Paths, and Influencing Factors Framework.

6.2 Discussion of Case Study 1 Results – Efficiency Co.

The objective of this first case study was to answer the following research questions taking an efficiency perspective.

RQ3: How do B2B companies manage service digitalization projects in practice, and what are the potential challenges and learnings?

In detail, in this case study it was sought to better understand ‘why’ an B2B organization engages in service digitalization activities ‘what’ benefits and costs from dyadic perspective (provider & user view) are involved and ‘how’ it deals with the challenge of deciding, designing, implementing a service digitalization project in the efficiency field that affects customers as well as internal stakeholders. In addition, the intention was to present real-life examples from B2B digital transformation practice about the adoption dimensions that were identified in phase one explorative expert interviews (see Section 4.5.5.7).

We have seen that the digitalization journey of Efficiency Co. itself has been influenced both by external market developments (customer demands) and internal challenges (generating cost efficiencies). In addition, it has been highly dynamic meaning that there are different phases and corresponding activities. Within each phase a different set of numerous key success factors were identified to address different challenges that were faced over time spanning a complex set of intertwined fields ranging from technology, functional, organizational and different ways of working.

6.2.1 Benefits and Costs in an Efficiency Driven Digitalization Set-Up

First, taking cost and benefits perspective the initially identified cost and benefits and cost categories in section 4.3 and 4.4 were confirmed. In addition, the Efficiency Co. case provided some rich in practice insights what cost and benefits within efficiency space occurred giving certain ‘flesh to the bone’ (see Section 5.2.4). When comparing the taken user- and provider- benefits & cost perspective there are several insights worth mentioning (see Figure 34).

Figure 34: Comparative View of Provider- and User Efficiency Benefits and Costs.

Value Elements	Provider side - *52 references*	User Side – *112 references*
A. BENEFITS	• **Services & Sales Front Desk Volume Optimization** *(Re-use gained capacity for more complex cases and/or save budget)* • **Higher Quality and Speed** *(Replacing the manual with the automatic, save on capacity, increase customer satisfaction, fulfil legal requirements)* • **Increased Employee Motivation** (Less monotonous tasks, more capacity in core function)	• **Continuous Availability** – 24/7 service use case fulfilment • **Maximised Quality** – no errors due to automatic, pre-defined use case structures • **Increased Speed** – much higher service fulfilment up to just in time • **Higher Transparency & usability** – products services usage, commercial contract details & legal compliance
B. COSTS	• **Implementation cost:** Program Mgmt costs, IT Infrastructure one-offs • **Maintenance costs:** Licensing costs correlating with activity volume • **Costs of complexity & Legacy:** nowadays outdated infrastructure facing latest customer demands • **Cost to transform:** Communication, change management activities	• **Opportunity costs: cost to change way of working**

It can be said that within the efficiency case value which is understood as benefits minus costs (see Section 2.7) happens on several dimensions.

On the one hand, value is generated on the provider side as efficiency gains for Efficiency Co. are lifted as formerly manual task are shifted to digital. Frankly speaking, the same standard service task costing a price X before can be fulfilled now at a price Y with Y being lower than X. In this scenario Efficiency Co. could have substituted parts of its service personal by the digital service platform saving a certain volume on employee operational expenditures which was partly done over time addressing the heavy cost pressures - in other words value by saving operational expenses. However, part of the capacity gained from shifting to digital has been reinvested by Efficiency Co. to address more complex service requests. Such more complex service requests were expected to generate higher customer satisfaction and creating indirectly higher value as such customers were more loyal. This could be seen as some kind of opportunity value case meaning that Efficiency Co. can decide on either to cash

in the savings, which creates value under the assumption that cost get less, and benefits stay the same. An alternative would be to invest the capacity savings in new service use cases and value is generated by cost stay the same, but benefits are increased. The latter could be seen as ‘Doing the right things’ effectiveness measure.

Interestingly, even with Efficiency Co. targeting a pure efficiency ‘Doing things right’ scenario, a side product was to lift benefits in the effectiveness ‘Doing the right thing’ space by engaging in new solution-oriented conversations with customers. However, it must be acknowledged that the main part of Efficiency Co. efforts was to lift pure cost efficiencies with the responsible service department manager and former project communication lead giving an indication that 80% were cost efficiencies and 20% effectiveness gains.

A similar approach can be taken on the user side. On a user side value is created as benefits stay the same, as a user I receive the same standard service, but costs for me as time invested etc. gets less as the tool is available 24/7 and working simultaneously. Of course, there might be higher costs depending on how much more effort it is to operate the tool in comparison to how much effort it took to manually demand the service case. In each case the relationship value as the sum of benefits and costs from a provider and user side increases as a sum of all benefits and costs associated (see Section 2.7.2). In this respect relationship value is increased by the respective individual optimization of each party.

The two previous examples were mono-sided perspective meaning either from a provider or user side. Within the interviews and from coding analysis it became clear that the digital service tool could also have a dual-side influence on the relationship and with-it relationship value. In this respect, value is created as time saved and reinvested in addressing new solution service cases on Efficiency Co. side new value is generated. However, this value materializes only if the respective activities are seen as value-add from a user perspective side. As a summary it can be said that value in this efficiency case is created by individual optimisation focussing on the cost side and joint value creation focussing on additional benefits.

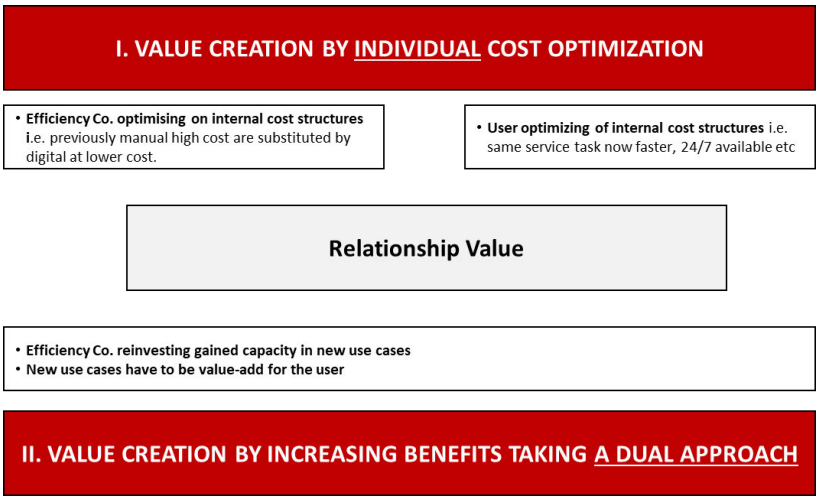


Figure 35: Ways of Relationship Value Enhancement in Efficiency Service Digitalization Use Case.

Proposition 6:

With efficiency-driven service digitalization measures, relationship value can be enhanced by:

(i) Reducing costs on the provider and/or user side, and

(ii) Increasing benefits by investing efficiency gains (such as time saved, service capacity freed, budget saved)

(iii) Efficiency gains could be used to do more of the exiting services or to create new services.

Proposition 7:

Service digitalization measures targeting efficiency gains can have an effectiveness component when efficiency gains are invested in effectiveness focussed services that are valued by the customer.

Second, the previously established service digitalization framework including the identified internal adoptions factors served as a feasible foundation to structure interviews and interview results (see Figure 33). There were no new functional categories identified from the interviewee side which could have been added to the model. This conclusion is based on the thematic analysis of all interviews (coding) and the fact that at the end of each interview the interviewee was asked explicitly if anything worth mentioning considering the digital self-

service tool was not addressed which was declined by all interviewees (see Questionnaire: Appendix IIIa).

Third, even with the previously model and model elements being confirmed by all interviewees (see Figure 33) it became clear to the author that there are four elements worth adding to the model:

a) that digitalization is timely process consisting of different phases and episodes,
b) that an overall process connecting all digitalization elements exist, and
c) that there are more than just functional capabilities required to successfully manage digitalization endeavours.
d) that targeted efficiency gains can also have effectiveness gains as a side effect.

Referring to the first (a. digitalization as a timely process), would address the dynamic character of the implementation of the digital service tool meaning that it has several phases, over time and in each phase a different combination of demands exists that needs to be addressed (see Section 5.1.4).

With respect to b. an overall digitalization process would address the fact that the journey of implementing a digital service tool consists of several dependent and independent complex sets of activities which could be classified as a process (Hammer, 2015). Looking into recent digitalization and the formulation and execution of activities is often referred to as ‘digital transformation strategy’ (DTS). According to Chanias et al. (2019) a digital strategy should encompass ‘a ‘fusion view’, in which business strategy and information system decision are likened. Frankly speaking there is no longer a clear-cut distinction between information system strategy and business strategy as postulated for long in the literature as the one influences the other (Bharadwaj et al., 2013; Galliers, 2011; Mithas et al., 2013).

In this sense DTS can be seen as equally business centric and stimulated by technology and seeks to provide possible insights ‘how’ an organization wide digital strategy might be designed and implemented which serve as a good fit to research intention is this efficiency case study (Chanias et al., 2018; Hess et al., 2016).

Burgelman et al. (2018) recently recommend that the analysis of an DTS implementation process should follow a combinatory approach meaning that it should treat the overall strategy process equal to concrete activities that happen in organizational practice. In this sense the overall process would refer to a sequence of measures that explain how a certain strategy is shaped and implemented (Ali & Anwar, 2021; Brown & Brown, 2019), such organizational practices consider the ongoing day to day activities by the actors involved formulating and executing a strategy who have a variety of procedures, norms and tools to their disposal - in other words so called 'practices'. Within Efficiency Co. such 'practices' materialized with several fields (see Appendix IIIb, Table 18).

6.2.2 Capabilities in Service Digitalization

The third comment, that there is more than functional capability required would complement the 'people' category in a way that it is a certain organizational capability to decide on 'what' is exactly needed based on what internal or external situation to an organization at what point in time in what format and depth. This capability is different to purely functional capabilities as having an IT programmer in place to design and implement the tool, or a service engagement manager who explains the tool to a customer. Within business model innovation literature this concept is often referred to as 'dynamic capabilities' (Rachinger et al., 2018; Mezger, 2014; Schweizer, 2005).

According to Teece (2018) dynamic capabilities:

'… include the sensing, seizing, and transforming needed to design and implement a business model. They can enable an enterprise to upgrade its ordinary capabilities and direct these, and the capabilities of partners, toward high-payoff endeavours. This requires developing and coordinating, or 'orchestrating,' the firm's (and partner firms') resources to address and even shape changes in the marketplace, or the business environment more generally.'

(Teece, 2018; p. 43).

Hence, how much an organization can adapt to external and internal circumstances can be seen as a dynamic capability itself (Dottore, 2009; Rachinger et al., 2018). According to Rachinger et al. (2018) and Teece (2018) such a dynamic capability materializes in some kind of learning driven approach and as a combination of sensing, seizing and reconfiguring activities that would point out certain business opportunities or threats, offering way of adapting and aligning with overall business strategy (Baden-Fuller & Teece, 2020; Teece, 2018). More concretely, 'sensing' would include the ability recognise alternative potential of a more beneficial business model seen at a competitor, in adjoining markets or across sector boundaries. 'Seizing' in this sense would be understood as focussing on concrete organizational innovation activities based on identified market developments and combining organizational elements as technology. 'Reconfiguring' implies the identification and sourcing of respective resources and core competencies internally while also being open to use external partners with complementary competencies (Dottore, 2009; Mezger, 2014).

Dynamic capabilities are claimed to be multi-faceted, and it can be argued that firms will not necessarily be strong across all three types (Teece, 2018). A firm might possibly excel in sensing that there are new developments and possible new business opportunities but be weak at identifying in translating them to the own business model to exploit them. On the contrary, an organization might be excellent in developing new business models yet be mediocre at refining and implementing them in the existing organisation. One of the key elements for organizational dynamic capabilities to seize new opportunities is seen in most cases the managerial competence of developing and redefining business models and has been developed into an own research field (Helfat & Martin, 2015; Teece, 2007).

In the case of Efficiency Co. dynamic capabilities in sensing, seizing, and reconfiguring materialized as followed (see Table 19). From a 'sensing' perspective there were developments in the telecommunication market (loosing of tenders) and technological developments (I-Phone effect, Online self-service effect) that were taken up by sales and bid management resources at Efficiency

Co. and communicated to senior management. About 'seizing', senior management most of all the responsible P&L of the B2B service unit decided on launching the project, scoping it and creating overarching vision and underlying beneficial business cases to staff the project. Resources were first part-time and over time full-time on the project. Internal resources were complemented with external resources. Technological development was given externally. 'Reconfiguration' was a lengthy change management process of changing Efficiency Co. organizational routines and structures. Standard service demands were directed towards digitally against heavy organizational inertia especially from sales and service frontline staff which was further intensified by workers council. After a stabilization phase, which took several years, organizational structures were changed as implementing a dedicated department that owns the overall processes around the digital service tool and future developments.

Table 19: Dynamic Capabilities in Theory from Literature and Practice at Efficiency Co.

Dynamic Capabilities in an organization			
	A. Sensing Capability	**B. Seizing Capability**	**C. Reconfigure Capability**
Definition in 'Theory': *(Rachinger et al., 2018; Teece, 2018)*	Identifying new opportunities based on market and technology developments & technological possibilities etc.	Designing & refining existing business model; engage necessary internal and external resources.	Realigning structure & culture within a transformation process. Changing organizational routines.
Application in 'Practice': *(Efficiency Co. case study)*	Strong market demand that materialized in loss of projects & technological developments already in place at competitors or in other sectors. Sales & Marketing staff communicating it and Senior Mgmt taking it up.	Service Senior Mgmt. initiating official project, creating a vision, defining scope & staffing internal resources. Explicitly deciding to use external expertise to complement internal expertise and close capability gaps.	Changing internal and external 'way of working' by fulfilling standard service use cases digital only. Changing the service and sales culture by integrating a tool that was first seen as competition and later as support. Creating organizational structures in form of departments and functions.

Based on this analysis it can be said that there is no one key success factor that was responsible for the successful implementation of digital service platform it is more the sum of numerous elements across different dimension over a long period of time that were important.

Proposition 8:

To successfully realize service digitalization activities, the following types of capabilities and practices are suggested:

(i.) Sufficient functional capability that is needed to realize service digitalization measures (software programmers, process engineers, change managers, etc.),

(ii.) Dynamic capability consisting of sensing capability, seizing capability, and reconfiguring capability that is needed to adapt to internal and external circumstances, and

(iii.) Implementation of organizational transformation practices. Suggested fields are end-to-end vision creation and distribution, consequent decision-making, strong focus on business case delivery, and formalization of delivery structures.

6.3 Discussion of Case Study 2 Results – Effectiveness Co.

The objective of this second case study was to answer the following research questions taking an effectiveness perspective.

RQ3: How do B2B companies manage service digitalization projects in practice, and what are the potential challenges and learnings?

In detail, in this case study it was sought to better understand ‘why’ an B2B organization engages in service digitalization activities having an effectiveness focus - in other words ‘what’ benefits and costs from dyadic perspective (provider & user view) are involved and ‘how’ it deals with the challenge of deciding, designing, implementing a service digitalization project in the effectiveness field that affects customers as well as internal stakeholders.

In addition, the intention was to complement and/or adapt and specify the adoption dimensions that were identified in phase one explorative expert interviews (Vision, People, Change Management, Technology and Data, Business Model and Financial Aspects).

We have seen that the digitalization journey of Effectiveness Co. itself has been influenced both by external market developments (Digital transformation discussion in adjacent markets) and competitive advantage considerations has been highly dynamic meaning that there are different phases and corresponding activities. Within each phase a different set of numerous key success factors were identified to address different challenges that were faced over time spanning a complex set of intertwined fields ranging from technology, functional, organizational and ways of working. As a summary the following can be said.

6.3.1 Benefits and Cost in Effectiveness Driven Service Digitalization

Taking cost and benefits perspective the initially identified cost and benefits and cost categories in Sub-Section 4.3 were confirmed (see Table 10 & Table 11). However, it can be noted that new cost categories or verifications of the cost categories were identified. Examples would be the ‘cost to comply’ meaning that certain legal requirements needed to be fulfilled to process the data that is generated. In addition, the Effectiveness Co. case provided some rich in practice insights what cost and benefits within effectiveness space occurred giving certain ‘flesh to the bone’, when comparing the taken user- and provider-benefits & cost perspective there were numerous elements identified (see Appendix IIIc, Table 32).

From a benefits perspective the main point worth highlighting is that Effectiveness Co. created a service offering in form of different digital service products that can be added as an additional functionality to the specialised machinery - in other words physical products as sweepers have now digital services modules available. This additional service products are the commercial

basis for generating new revenues that were not be possible in a non-digital world only. However, it is not just the commercial benefits of generating new revenues with digital service offerings. In addition, the insights gained through the data that is generated by the machines and aggregated as well as analysed in the digital service platform is beneficial to any ongoing or future engineering tasks at Effectiveness Co. (see Table 16). For the first time engineering can access real time data from machines that are operational which helps to understand possible malfunctions (Error codes of the machines) and to find solutions to that.

In addition, this pool of data also serves as a source of increasing technical service productivity as customer problems can be much faster understood as error codes are available in real time on the digital service platform being accessible for the customer as well as the support staff. In this sense the value generated for the Effectiveness Co. is the combination of new revenue streams being created by the digital service portfolio offered as well as the efficiency gains in engineering and support functions.

From a relationship value perspective Effectiveness Co. increases the benefit dimension with the new digital services at customers that have physical machinery only as well as reducing the costs of any technical service incidents by providing a more efficient service support (see Figure 36). These elements are mirrored on the customer side meaning that the customer can benefit from new digital services and a higher quality support from Effectiveness Co.

Consequently, it can be said that the value that is generated in case study 2 is a combination of effectiveness measures i.e. new digital service modules generating new revenues), and efficiency gains i.e. existing engineering activities, and technical support getting better i.e. faster and richer insights etc.

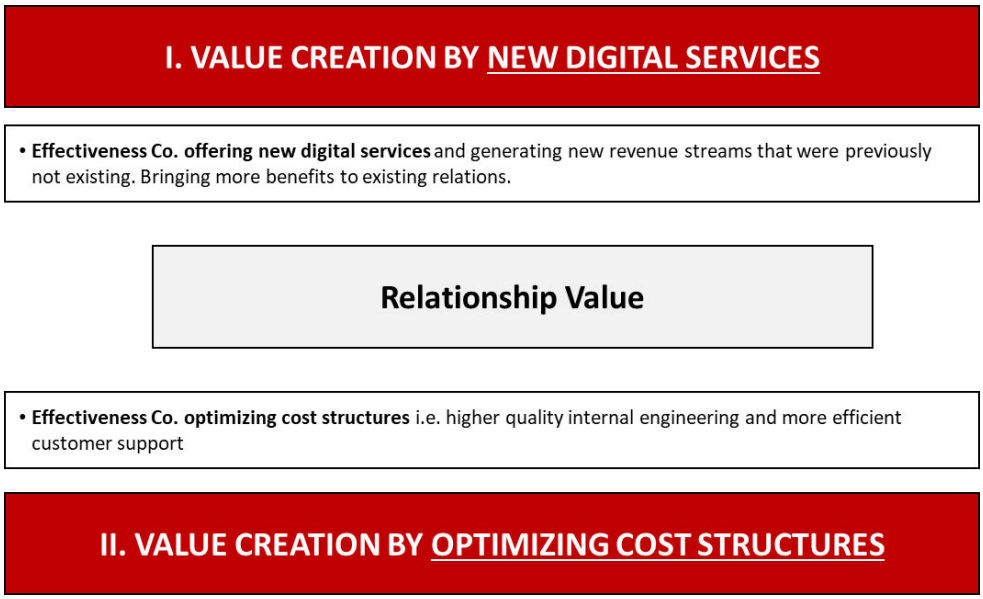


Figure 36: Ways of Relationship Value Enhancement in Service Digitalization Effectiveness Case.

Proposition 9:

In effectiveness service digitalization measures, relationship value is enhanced by:

Creating and selling new digital services that offer new benefits to the user audience,

Optimizing existing cost structures in the organization that are directly or indirectly associated with the new services, and

Implementing service digitalization measures targeting effectiveness gains, which can have an efficiency component when effectiveness gains provide a foundation for the enhanced efficiency of existing processes.

Proposition 10:

Service digitalization measures targeting efficiency or effectiveness gains when it comes to relationship value enhancement can overlap in how value is created. Efficiency measures can lead to effectiveness benefits and vice versa.

6.3.2 Capabilities in Effectiveness Driven Service Digitalization

To arrive at a state to generate value, Effectiveness Co. went through a lengthy and complex process employing different sets of capabilities as identified in this summary sub-section of case study 2.

Table 20: Dynamic Capabilities in Theory and Practice at Effectiveness Co.

Dynamic Capabilities in an organization			
	A. Sensing Capability	**B. Seizing Capability**	**C. Reconfigure Capability**
Definition in 'Theory': *(Rachinger et al., 2018; Teece, 2018).*	Identifying new opportunities based on market and technology developments & technological poss bilities etc.	Designing & refining existing business model; engage necessary internal and external resources.	Realigning structure & culture within a transformation process. Changing organizational routines.
Application in 'Practice': *(Effectiveness Co. case study)*	Senior Management that became aware of the Industry 4.0 & digital transformation discussion. Developments in automotive sector and agriculture space as adjacent sectors.	Launching a digital service project. Appointing internal resources and complementing them with external expertise (Recruiting & partnering)	Appointing successively more people. However, no larger changes in organizational structures or routines realised and planned.

Similar to case study 1 several dynamic capabilities were exercised (see Table 20). Effectiveness Co. management became aware of market developments engaging in an internal process to 'make sense' what that could mean for Effectiveness Co. concluding that it would be a new opportunity that is not addressed in large by any other competitor (Sensing Capability). In this sense, Effectiveness Co. was driven by striving for a possible competitive advantage which is in clear contrast to Efficiency Co. that was forced by market developments and customers demanding something. With regard to, 'seizing capability' Effectiveness Co. went a similar way as 'Efficiency Co.'. Internal resources were appointed and as it became clear that functional capabilities as programming skills etc. were missing this was recruited from the market. Similar to case study 1 Effectiveness Co. decided to 'buy' instead of producing a digital service platform on their own by engaging with a partner specialised in that field

that provided an end-to-end managed service for designing, programming and maintaining a platform. Effectiveness Co. is still in the process and very cautious of reconfiguring its existing structures taking a step-by-step approach. From the interviews it became clear that were no larger organizational changes implemented so far and seems not to be planned for the near future. There were no clear indications throughout most of the interviews what are the reasons for it however, some interviewees mentioned that this might be due to missing overall strategy and buy in executing the vision consequently. Others mentioned in response that as benefits are still behind expectations the foundation is missing to do larger changes (see Section 5.2.3.6). Changing organizational routines and structures and corresponding challenges is well known phenomenon in digital transformation- and change management literature (Hanelt et al., 2021; Hylving, 2015). In this context persistence is highlighted as an informal enabler to establish control and stability in organization that are in the process of change. Persistence can be classified as a personal skill that:

'…can be described as an individual's drive and confidence to continue to work on an idea even though existing structures don't support the idea.'

*(*Hylving, 2015; p. 4169).

Persistence as a concept signifies continuous engagement despite of frustration and fatigue. Within Effectiveness Co. case this persistence was executed throughput the whole project as there were also number of new challenges to be dealt with within each phase. Persistence was informally executed by the central project team and manager in charge. In some way the missing of benefits as previously assumed in the business case can be seen as one of these challenges with persistence being a possible answer. Consequently, it can be argued that with the positive feedback Effectiveness Co. is receiving and first customers paying for the additional digital services it is a question more about time, when to achieve intended benefits.

Proposition 11:

Persistence in the execution of service digitalization measures is a key element, as benefits are only fully realized when they are valued by the user. This typically happens after all enablers have been realized, which can be lengthy process.

6.3.3 Service Digitalization Phases

In addition, it became evident that the process of conceptualising, deciding, and executing the service digitalization project at Effectiveness Co. was the sequence of different project phases (See Table 31) with each phase having certain characteristics in terms of challenges to address and deliverables to realise. Dividing transformation projects and any other kinds of projects is not new to managerial and scientific knowledge (Bellantuono et al., 2021; Burgelman, 2020; Chanias et al., 2019; Hassani et al., 2018). However, for this research project it is seen as a reasonable element to be integrated in the intended service digitalization relationship value framework. Even more, as the project phase were as well applicable in the Efficiency Co. case study targeting efficiency benefits (see Section 5.1.4).

Proposition 12:

Service digitalization execution in an organization is dynamic, happening in phases, with each phase having specific characteristics to be addressed to be successful. Following Bellantuono et al., (2021) phases can be structured in:

i.) Need recognition and initiation,
ii.) Scope formulation and setting the stage,
iii.) Implementation and scope extension, and
iv.) Scaling and formalization.

Phases have no clear-cut borders and can have overlaps.

6.4 Summary Discussion Chapter and Framework Modeling

Based on findings within this research project a total of 12 propositions were derived to enable decision makers and programme managers in the B2B service digitalization space to make more informed decisions when deciding and executing service digitalization measures with the objective of enhancing relationship value. The propositions were continuously constructed throughout this primary data engagement in this research project i.e. expert interviews, two case studies each step being accompanied with critical reflection of existing literature.

Out of clarity reasons the propositions are structured along the corresponding Research Questions 1–3 within the table below and can be seen as a high-level summary answering them (See Table 21).

Table 21: Propositions for B2B Service Digitalization Enhancing Relationship Value

<table>
<tr><td colspan="3">RQ1: What is the potential of service digitalization in B2B relationship value management?</td></tr>
<tr><td colspan="3">Proposition 1:

There is a heterogenous level of understanding of and within B2B organizations towards:

(i) What digitization, digitalization, and digital transformation really mean and

(ii) What digitalization paths exist in service digitalization

In general, B2B organizations can consider two main service digitalization paths: One aims for efficiency gains by ‘doing things right’, while the other is effectiveness-driven, doing the right things. Both are not always clear-cut and can have overlaps.</td></tr>
<tr><td>see Section 4.2</td><td>Table 9: Digitalization From a Consultant and Client Perspective</td><td>Expert Comments</td></tr>
<tr><td colspan="3">RQ2: What factors influence the value in practice perception of service digitalization in B2B relationship management?</td></tr>
<tr><td colspan="3">Proposition 2:

Expected benefits are important factors to engage in service digitalization activities. Benefits in B2B service digitalization are numerous and can be clustered along the efficiency (doing things right) and effectiveness (doing the right things) dimensions. Most companies objective for efficiency benefits, as they are supposedly less complex. However, some companies start</td></tr>
</table>

with efficiency benefits and develop effectiveness benefits later when there are more digitally mature.		
see Section 6.1.2	Table 10: Dyadic View on Benefits of B2B Service Digitalization Efforts	Expert Comments
Proposition 3: Costs in B2B service digitalization projects are manifold and can be seen from different angles. It concerns more than simply investments in technology and can be clustered in: (i) Costs of technology, (ii) Adoption–transformation and change management costs, and (iii) Opportunity costs. The combination of benefits and costs influence a company's decision to invest in service digitalization paths.		
see Section 6.1.3	Table 11: Dyadic View on Costs and Risks of B2B Service Digitalization Efforts	Expert Comments
Proposition 4: Influencing factors of B2B service digitalization are numerous and can be clustered into internal and external factors with corresponding sub-categories. Sub-categories include environmental and relationship types, underlying product and service complexity, process- and technology-related factors, and sector-specific factors known from the technology adoption theory as TOE. Additional factors include a company's investment cycle, place in the digital maturity curve, digitalization expectations, and understanding of digitalization paths.		
see Section 6.1.4	Table 12: Internal and External Influence Factors of Business-to-Business Digitalization	Expert Comments
Proposition 5: There are six main challenge dimensions in B2B service digitalization of which companies must be aware: vision, business model, people, data and technology, change management, and financial aspects. Each dimension has specific characteristics to be addressed. In addition, dimensions must be seen in correlation with each other, not in isolation.		

see Section 6.1.5	Figure 31: Challenge Dimensions in B2B Digitalization	Expert Comments
Proposition 6: With efficiency-driven service digitalization measures, relationship value can be enhanced by: (i) Reducing costs on the provider and/or user side, and (ii) Increasing benefits by investing efficiency gains (such as time saved, service capacity freed, budget saved) into maximizing existing service-use cases or by creating new service-use cases.		
see Section 6.2.1	Figure 35: Ways of Relationship Value Enhancement in Efficiency Service Digitalization Use Case.	Case Study 1
Proposition 7: Service digitalization measures targeting efficiency gains can have an effectiveness component when efficiency gains are invested in effectiveness service-use cases that are valued by the customer.		
see Section 6.1 & 6.2	Figure 35: Ways of Relationship Value Enhancement in Efficiency Service Digitalization Use Case.	Case Study 1
Proposition 8: To successfully realize service digitalization activities, the following types of capabilities and practices are suggested: (i.) Sufficient functional capability that is needed to realize service digitalization measures (software programmers, process engineers, change managers, etc.), (ii.) Dynamic capability consisting of sensing capability, seizing capability, and reconfiguring capability that is needed to adapt to internal and external circumstances, and (iii.) Implementation of organizational transformation practices. Suggested fields are end-to-end vision creation and distribution, consequent decision-making, strong focus on business case delivery, and formalization of delivery structures.		
see Section 6.2.2 & 6.3.2	Table 16: Dynamic Capabilities in Theory from Literature and Practice at Efficiency Co.	Case Study 1 and Case Study 2

<table>
<tr><td colspan="3">Proposition 9:

In effectiveness service digitalization measures, relationship value is enhanced by:

i.) Creating and selling new digital services that offer new benefits to the user audience,
ii.) Optimizing existing cost structures in the organization that are directly or indirectly associated with the new services, and
iii.) Implementing service digitalization measures targeting effectiveness gains, which can have an efficiency component when effectiveness gains provide a foundation for the enhanced efficiency of existing processes.</td></tr>
<tr><td>see Section 6.3</td><td>Figure 36: Ways of Relationship Value Enhancement in Service Digitalization Effectiveness Case.</td><td>Case Study 2</td></tr>
<tr><td colspan="3">Proposition 10:

Service digitalization measures targeting efficiency or effectiveness gains when it comes to relationship value enhancement can overlap in how value is created. Efficiency measures can lead to effectiveness benefits and vice versa.</td></tr>
<tr><td>see Section 6.2. & 6.3</td><td>Figure 36: Ways of Relationship Value Enhancement in Service Digitalization Effectiveness Case.</td><td>Case Study 2</td></tr>
<tr><td colspan="3">RQ3: How do B2B companies manage service digitalization projects in practice? What are the potential challenges and learnings?</td></tr>
<tr><td colspan="3">Proposition 11:

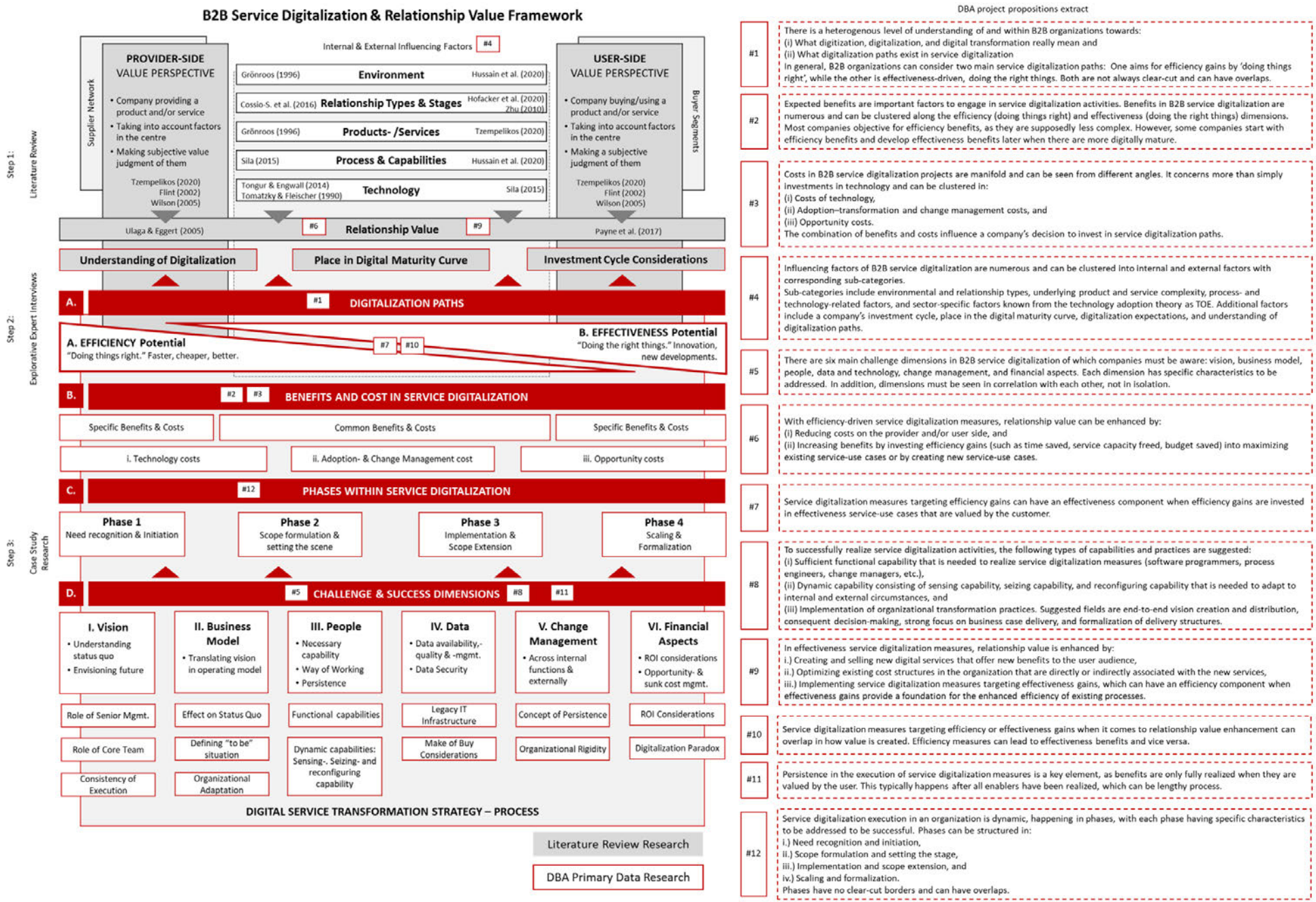
Persistence in the execution of service digitalization measures is a key element, as benefits are only fully realized when they are valued by the user. This typically happens after all enablers have been realized, which can be lengthy process.</td></tr>
<tr><td>see Section 6.3.2 & 6.4</td><td>See Hanelt et al., 2021; Hylving, 2015.</td><td>Case Study 2</td></tr>
</table>

Proposition 12:		
Service digitalization execution in an organization is dynamic, happening in phases, with each phase having specific characteristics to be addressed to be successful. Following Bellantuono et al., (2021) phases can be structured in: *i.)* Need recognition and initiation, *ii.)* Scope formulation and setting the stage, *iii.)* Implementation and scope extension, and *iv.)* Scaling and formalization. Phases have no clear-cut borders and can have overlaps.		
see Sections 6.3.3	See Bellantuono et al., 2021	Case Studies 1 and 2

Resulting from the continuous academic engagement within this thesis as a literature review (see Chapter 2), expert interviews (see Chapter 4), and two case studies (see Section 5.1 & 5.2) a B2B service digitalization relationship value enhancement framework is proposed (see Figure 37). In more detail, in step one, insights from the literature review in the field of relationship management theory, technology theory and value theory were taken and incorporated in the model . This includes aspects from relationship management- and value theory as the ‘dyadic lens’, meaning that there is a provider- and a supplier side to consider when managing relationships and relationship value (see Section 2.3.2). From technology adoption theory, elements from the TOE model served as internal and external influencing dimensions i.e. environment, product and service complexity etc. (see Section 2.4). Such elements are accepted variables in to influence a company’s adoption of technology such as service digitalization (Sila, 2015).

In step two, insights generated in explorative expert interviews as the existence of different service digitalization paths and corresponding benefits- and cost dimensions including subdimensions were added (see Section 4.1.2 & 4.1.3). These various dimensions give a high-level perspective on what benefits and costs can occur within service digitalization including a more detailed view in the various Tables provided (see Table 10, 11, 15 & 17).

In step three, based on two case studies, identified phases in digitalization programmes were added as well as potential challenge and success dimensions and in-practice examples (see Sections 5.1.3 & 5.2.3). The combination of different phases and the sum of challenge success can be seen as the digitalization journey and transformation process of companies. In addition to step one to three, all propositions of this research project were mapped giving more detailed information to the framework presented (see Figure 37). In total, this B2B service digitalization relationship value enhancement framework provides a value-add along several dimensions and for numerous stakeholders, that will be outlined in detail in the subsequent chapter within the contribution to knowledge and practice (see Chapter 7 & Table 22).



DBA project propositions extract

#1	There is a heterogenous level of understanding of and within B2B organizations towards: (i) What digitization, digitalization, and digital transformation really mean and (ii) What digitalization paths exist in service digitalization In general, B2B organizations can consider two main service digitalization paths: One aims for efficiency gains by 'doing things right', while the other is effectiveness-driven, doing the right things. Both are not always clear-cut and can have overlaps.
#2	Expected benefits are important factors to engage in service digitalization activities. Benefits in B2B service digitalization are numerous and can be clustered along the efficiency (doing things right) and effectiveness (doing the right things) dimensions. Most companies objective for efficiency benefits, as they are supposedly less complex. However, some companies start with efficiency benefits and develop effectiveness benefits later when there are more digitally mature.
#3	Costs in B2B service digitalization projects are manifold and can be seen from different angles. It concerns more than simply investments in technology and can be clustered in: (i) Costs of technology, (ii) Adoption–transformation and change management costs, and (iii) Opportunity costs. The combination of benefits and costs influence a company's decision to invest in service digitalization paths.
#4	Influencing factors of B2B service digitalization are numerous and can be clustered into internal and external factors with corresponding sub-categories. Sub-categories include environmental and relationship types, underlying product and service complexity, process- and technology-related factors, and sector-specific factors known from the technology adoption theory as TOE. Additional factors include a company's investment cycle, place in the digital maturity curve, digitalization expectations, and understanding of digitalization paths.
#5	There are six main challenge dimensions in B2B service digitalization of which companies must be aware: vision, business model, people, data and technology, change management, and financial aspects. Each dimension has specific characteristics to be addressed. In addition, dimensions must be seen in correlation with each other, not in isolation.
#6	With efficiency-driven service digitalization measures, relationship value can be enhanced by: (i) Reducing costs on the provider and/or user side, and (ii) Increasing benefits by investing efficiency gains (such as time saved, service capacity freed, budget saved) into maximizing existing service-use cases or by creating new service-use cases.
#7	Service digitalization measures targeting efficiency gains can have an effectiveness component when efficiency gains are invested in effectiveness service-use cases that are valued by the customer.
#8	To successfully realize service digitalization activities, the following types of capabilities and practices are suggested: (i) Sufficient functional capability that is needed to realize service digitalization measures (software programmers, process engineers, change managers, etc.), (ii) Dynamic capability consisting of sensing capability, seizing capability, and reconfiguring capability that is needed to adapt to internal and external circumstances, and (iii) Implementation of organizational transformation practices. Suggested fields are end-to-end vision creation and distribution, consequent decision-making, strong focus on business case delivery, and formalization of delivery structures.
#9	In effectiveness service digitalization measures, relationship value is enhanced by: i.) Creating and selling new digital services that offer new benefits to the user audience, ii.) Optimizing existing cost structures in the organization that are directly or indirectly associated with the new services, iii.) Implementing service digitalization measures targeting effectiveness gains, which can have an efficiency component when effectiveness gains provide a foundation for the enhanced efficiency of existing processes.
#10	Service digitalization measures targeting efficiency or effectiveness gains when it comes to relationship value enhancement can overlap in how value is created. Efficiency measures can lead to effectiveness benefits and vice versa.
#11	Persistence in the execution of service digitalization measures is a key element, as benefits are only fully realized when they are valued by the user. This typically happens after all enablers have been realized, which can be lengthy process.
#12	Service digitalization execution in an organization is dynamic, happening in phases, with each phase having specific characteristics to be addressed to be successful. Phases can be structured in: i.) Need recognition and initiation, ii.) Scope formulation and setting the stage, iii.) Implementation and scope extension, and iv.) Scaling and formalization. Phases have no clear-cut borders and can have overlaps.

Figure 37: Adapted Service Digitalization and Relationship Value Framework and Propositions

7 CONTRIBUTION TO KNOWLEDGE AND PRACTICE

In this chapter results are considered with respect to the contribution to knowledge concerning B2B service digitalization and relationship value management. Additionally, the contribution to practice is considered in the context of the avenues that B2B firms can choose in service digitalization. Moreover, influencing factors, value perspectives, and real-life organizational challenges and learnings are presented.

The contributions to practice and knowledge are structured using a framework provided by Corley and Gioia (2011) to facilitate the discussion of contributions with respect to practical as well as scientific utility.

7.1 Thesis Contribution in Relation to Underlying Research Objectives

The contributions of my thesis to knowledge and practice are based on an engaged academic approach combining both academic rigour and practitioner relevance of under-researched aspects in the B2B service digitalization and relationship value domain (Hodgkinson & Rousseau, 2009; Hodgkinson & Starkey, 2011; Lilien, 2016). New insights have been uncovered regarding how digitalization materializes in practice and what challenges exist.

As one resulting proposition of this DBA research project, it is suggested to complement the efficiency dimension of doing things right and the effectiveness dimension of doing the right things with the insight that both dimensions are not clear-cut (Ramaseshan et al., 2015; Sila, 2015). Furthermore, this thesis is, to the best of the author's knowledge, the first to bridge the gap between service digitalization and relationship value management. Furthermore, it outlines a detailed level of cost and benefit elements within B2B service digitalization and their potential influence on relationship value in a dyadic setting (see Sections 6.1.2 & 6.1.3). It is hoped

that this has enriched the normative suggestions on the benefits of service digitalization literature by providing practical examples of highly specific cost and benefit elements associated with service digitalization activities from both the provider's and user's perspectives (see Sections 4.1, 6.1.3, 6.2.1 & 6.3.1).

In seeking answers to my primary research questions as well as providing concrete propositions built on real-life challenges and learnings, I aspired to provide a foundation for informed decision-making for B2B decision makers and programme executers. In doing so, this DBA research project aims to contribute to potentially reducing the high failure rates common to service digitalization projects (Ramesh & Delen, 2021).

The aspiration, aims, and objectives of this research project were set out as follows:

Aspirations and objectives:

To provide a set of recommendations for B2B decision-makers and programme managers who decide on and/or manage service digitalization activities that take account the latest insights from literature, complemented by building on previous practitioner practice (expert interviews) and real-life examples (case studies).

Objective 1:

To shed light on potential avenues to take in B2B service digitalization to increase relationship value.

Objective 2:

To make propositions regarding potential influencing factors in the field of B2B service digitalization as well as various value perspectives as the sum of all identified dyadic benefits and costs incurred.

Objective 3:

To provide a list of potential challenges that B2B practitioners may face, making corresponding propositions when deciding on and implementing

service digitalization measures and exemplifying corresponding learnings based on real-life examples.

Objective 4:

To propose a service digitalization relationship and value framework combining key elements from Objective 1–3 to provide a basis for better decision making for practitioners that has scientific utility.

From my own perspective, I believe these objectives have been achieved based on the analysis and findings in this thesis.

Objective 1 was answered by engaging in a diligent literature review of the latest articles around service digitalization paths, which were complemented by insights from eight knowledgeable experts from the B2B service digitalization field (see Sections 2.6 and 4.1).

Objective 2 was addressed by presenting the technology adoption theory (TOE) and adjacent research field from the literature (see Section 2.4). Furthermore, additional influencing factors were specified for the field of B2B service digitalization (see Section 4.5).

Objective 3 was answered by providing six concrete challenge dimensions based on expert interviews that were reflected in the light of academic research (see Section 4.6). These dimensions were enriched with in-practice examples from two case studies providing a series of detailed examples, learnings, and mitigation actions for potential challenges (see Sections 5.1.3 & 5.2.3).

Objective 4 was addressed by providing a service digitalization relationship value enhancement framework that was constructed iteratively based on insights from the literature review, results of the expert interviews, and case study outcomes (see Section 6.1, Figure 33 & Figure 39).

7.1.1 Summary of Main Research Findings and Their Practical and Scientific Utility

With all of the different aspects that were considered in this DBA research project, selecting the main insights for the summary chapter is challenging when it comes to contribution to knowledge and theory as well as contribution to practice.

In their article on 'Building Theory on Theory Building: What constitutes a theoretical contribution', Corley and Gioia (2011) propose a framework to structure research findings into two dimensions: utility and originality.

Utility in this sense would mean that the insight generated should be useful, in general, to improve the current research practices of scholars or organizational practitioners (Sheppard & Suddaby, 2017; Whetten, 1990). Scientific utility can be perceived as an improvement that advances conceptual rigor (Corley & Goia, 2011). Practical utility is apparent if theoretical contributions be applied directly to the challenges of practicing managers. In this respect, some scholars go as far as stating that focussing on practical problems is a feasible avenue to develop theory *per se* (Rivard, 2021).

Originality is a significant offering of a critical redirection of existing views or entirely new views (Conlon, 2002; Huff, 1999). The notion that, ideally, contributions to theory should progressively develop one's understanding, in general, is a long-venerated one (Kaplan, 2017). It has been consistently invoked over the years, leading to noticeable statements about theory contribution, such as this by Van de Ven (1989, p. 486), who states:

'Good theory is practical precisely because it advances knowledge in a scientific discipline, guides research towards crucial questions, and enlightens the profession of management'.

This framework is used to structure the contribution to practice and knowledge throughput in the following Sections (see Table 22).

Table 22: Practical and Scientific Utility Based on 12 propositions Made, Adapted From Corley and Gioia (2011).

<table>
<tr><th colspan="2">UTILITY</th></tr>
<tr><th>I. Practical Usefulness</th><th>II. Scientific Usefulness</th></tr>
<tr><td>a. Transparency on different B2B service digitalization paths to generate value (efficiency and effectiveness)

➔ Practitioners can inform themselves of what possibilities they have to lift values in B2B service digitalization.</td><td rowspan="2">a. Adding to the digitization, digitalization, and digital transformation discussion a value path perspective (efficiency and effectiveness).

➔ Researchers could integrate the value perspective in their digitalization research approaches, specifying not only when and how to digitalize but with what impact for whom exactly.</td></tr>
<tr><td>b. Their impact on relationship value (how value can be enhanced or not)

➔ They can make a connection between service digitalization paths and relationship value management.</td></tr>
<tr><td>c. Detailed list of corresponding specific benefits and costs elements, including a dyadic view beyond often-stated generic claims (provider and user perspective)

➔ Practitioners receive a detailed list of potential benefits and costs for providers and users to plan, sell, and manage their projects.</td><td>b. Complementing the generic value discussion with concrete benefits and cost elements in the service digitalization domain

➔ Researchers could integrate a more fine-grained and specific approach of what value components they are addressing.</td></tr>
<tr><td>d. Proposition of six challenge dimensions in service digitalization endeavours and in practice learnings as mitigation actions from two case studies

➔ Practitioners can inform themselves about potential challenges and possible mitigation actions from real-life examples (Case Studies 1 and 2).</td><td>c. Adding specific challenge dimensions in B2B service digitalization to the more generic adoption theory in that field and providing detailed practical examples of how these materialize.

➔ Researchers could build on a specific service digitalization model in the B2B domain.</td></tr>
<tr><td>e. A proposed service digitalization relationship value enhancement framework covering wide aspects of service digitalization in B2B.

➔ Practitioners can utilize a structural framework to structure and manage their service digitalization endeavours.</td><td>d. A proposed service digitalization relationship value enhancement framework covering wide aspects of service digitalization in B2B.

➔ Researchers could take the proposed model as a more holistic basis covering wider aspects of service digitalization in B2B.</td></tr>
<tr><td>Supports informed decision-making in B2B service digitalization relationship value practice

Potentially reduces high failure rates in service digitalization endeavours</td><td>Adds to the scarce research into B2B service digitalization.
Connects service digitalization and relationship value management theory

Extends the generic level of digitalization value elements and adoption factors to more fine-grained specific ones</td></tr>
</table>

7.1.2 Different Service Digitalization Avenues and Their Potential – an Efficiency and Effectiveness Value Lens

Undoubtedly, digitalization and, particularly, service digitalization are among the major topics in managerial and scientific discussion over the past decade. These topics are certain to retain their importance today and in the foreseeable future, as indicated in the aftermath of the first three COVID-19 waves (Hanelt et al., 2021; Lilien, 2016). Even with digitalization being a critical topic, it became clear in this research project that a general accepted definition of service digitalization remains unclear, albeit less in recent academic writing than in managerial practice. In this respect, it can be stated that terms such as digitization, digitalization, and digital transformation are defined academically (Laudien & Pesch, 2019; Newell & Marabelli, 2015), but their meanings in practice are still a challenge (see Section 4.2).

To address this challenge, this research project proposes to explain digitalization and connecting terms, making a discrete differentiation in efficiency (doing things right) and effectiveness (doing the right things) by taking a value lens approach to the benefits and associated costs, offering concrete challenges and learnings from real-life service digitalization examples (see Figure 38). From the perspective of the author, the following advantages are as follows.

First, decisions makers could connect much more easily by understanding that digitalization can be used to optimize existing processes without requiring changes to the entire business model and its underlying processes. They must learn to appreciate that they can continue doing what they do, but it will be done more efficiently. The same can be said for effectiveness, meaning that technology in the form of digitalization can be used to create new products and services, such that a company is providing services that are entirely new. However, there is more involved than simply providing a view of the various digitalization paths available. It is also about the specific characteristics of each path having common but divergent peculiarities

regarding costs and benefits incurred as well as challenges and learnings, as presented in Case Study 1 and Case Study 2 (see Sections 6.2 & 6.3). Therefore, and from a contribution-to-practice perspective, it is worth stating that effectiveness and efficiency paths and their commonalities and differences must be considered through a value lens in managerial decision-making (see Table 23).

From a contribution-to-knowledge perspective, it can be said that the literature dominantly focussed on one or the other aspect when addressing service digitalization (see Chapter 1 & Table 1). There are numerous examples that focus only on efficiency gains, often referred to as digital self-service (Sila, 2015), or only on effectiveness initiatives, often referred to in the context of innovation (Laudien & Pesch, 2019; Newell & Marabelli, 2015). This research project proposed to see both not in isolation but in relation to each other, which is, to the author's best knowledge, new to the academic discussion. There are common elements to both paths as the necessary digital technological foundation and necessary digitalization of processes. However, there are differences as well, as efforts to realize effective digitalization measures go along with higher costs, a fact that was mentioned throughout the expert interviews and in Case Studies 1 and 2 (see Section 4.4, 5.1.2.3 & 5.2.2.2).

Table 23: Thesis Contribution Concerning Service Digitalization Paths

SERVICE DIGITALIZATION PATHS	
A. Extant Literature 'From'	**B. My Thesis** 'To'
General discussion of digitization, digitalization, and digital transformation	***A specific discussion on B2B service digitalization integrating a new lens on value perspectives (efficiency and effectiveness gains).***
Few case studies focusing on B2B service digitalization research in general; most are single cases	***Adding to the pool of B2B service digitalization case studies offering a multiple case-study approach.***

7.1.3 Service Digitalization and Relationship Value in a Detailed Dyadic Cost-and-Benefit Perspective

Service digitalization in B2B has been thematized in several academic discussions in the past decade (Benedettini, 2017; Hofacker & Corsaro, 2020; Sila, 2015). However, even with numerous articles highlighting the benefits of using technology in the form of digitalization in the service environment, the discussion was focussed on a general level, leaving out the specific benefit and cost drivers and a focus on the beneficiaries (Wirtz & Kowalkowski, 2022). This research project sought to offer concrete benefit and cost dimensions and underlying elements to complement the normative discussion that digitalization in service can create value, taking a provider and user perspective that can affect relationship value in their interplay (see Table 32). This seems important, because, from a practice perspective, the ambition to increase value – which can be seen as the ultimate objective of entrepreneurial practice – it is not a value itself that must be managed. It is more about the benefit and cost elements of value that are targeted with certain activities. The result of that is an impact on value; in other words, one can objective to increase value but the way to do it is to make changes on the benefit and/or cost levels. Additionally, regarding the cost and benefit dimensions and elements identified in this research project, it is the discussion of service digitalization and relationship value management theory and practice within the B2B space that is new; to the author's best knowledge, this subject has not yet been explored.

Service digitalization has been discussed previously in the literature and in managerial practice. Relationship factors have been addressed as well, such as with the proposals made by the IMP Group in the 1980s that already included technology as a potential influencing element (Håkansson, 1982). However, taking a combined service digitalization and relationship value perspective and providing concrete cost and benefit dimensions and their respective elements has not been researched previously. Bringing service digitalization and relationship value theory and practice together seems vital

to do. From a practitioner's point of view, it is sensible to understand certain underlying mechanisms and not simply objective for some type of amorphous value. Instead, it is advantageous to deliberately decide what elements on the benefit and cost sides to target for both the providers and users.

From an academic point of view, this thesis adds to scarce research in B2B service digitalization and relationship management with two case studies of organizations that chose to take different digitalization paths (see Table 24). These paths were accompanied by different challenges, similar and different benefit and cost elements, and different levels of intensity. The provision of such detailed benefit and cost elements and their corresponding challenges through these case studies adds to the recent research call of Wirtz and Kowalkowski (2022) to propose cost-effective service excellence pathways, including corresponding challenges (see Table 1). In addition to highlighting different pathways to generate value, this DBA research project explores numerous internal and external influencing factors that can affect why companies choose to digitalize or not. Through this process this DBA research project answers recent calls for future research, such as by Shree et al. (2021), who state that a stronger understanding of digital (service) platforms in B2B is needed. Furthermore, in addition to exploring various influencing factors and providing a framework, detailed information about two corporate organizations is shared in this study to complement theory with rich insights from practice (see Section 5.1 & 5.2).

Table 24: Thesis Contribution to Service Digitalization and Relationship Value Enhancement

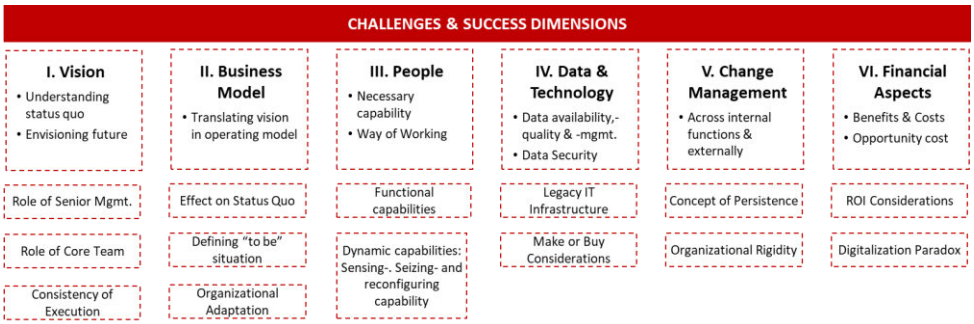
SERVICE DIGITALIZATION & RELATIONSHIP VALUE ENHANCEMENT	
Extant Literature 'From'	**Contribution of my thesis** 'To'
Treating service digitalization and relationship value management separately	***Combined view of service digitalization and relationship value as new lens within this academic field***
Generic discussion on value of digitalization with little consideration of concrete costs and benefits	***Detailed consideration of costs and benefits in B2B service digitalization and how value materializes***

7.1.4 Key Challenge Dimensions, Phases, and Learnings in B2B Service Digitalization

There are numerous challenges in the context of technology adoption, digital transformation, and service digitalization that are mentioned and discussed within the literature (see Chapter 2). One notable example for technology adoption research would be the works of Tornatzky and Fleischer (1990) and the TOE framework presented in section 2.4.2 that proposes several adoption dimensions, influencing factors, and corresponding challenges. However, although the TOE has been highlighted positively as a generic theory fit for multiple technology adoption purposes, including service digitalization (Zhu & Kraemer 2005), some academic voices state that, because of its generic character, the TOE might not capture the complete view of exactly how technology is adopted (Tscherning, 2012).

One of the objectives of this research project was to address this point by taking generic principles and making them more specific. This was done by providing a specific adoption framework in the field of B2B service digitalization and relationship value. To do so, influencing factors from the field of technology adoption were taken, verified, and enriched with insights from experts in the field of B2B digitalization. These factors were further specified by considering detailed elements from in-depth practical case studies (see Chapter 5.0). In this respect, this thesis builds on insights from generic theory as a TOE adoption model, making it specific to a certain field – in this case, B2B service digitalization and relationship management. This thesis does so by offering concrete challenge dimensions within service digitalization adoption and their specific characteristics and how they were addressed in two case studies (see Section 4.5). It can be said that, from the technology and change management literature, the adoption and challenge dimensions were previously known only on a generic level. However, this thesis verified and specified these dimensions using the approach of expert interviews and multiple case studies (see Figure 38).

Figure 38: Challenge Dimensions in B2B Service Digitalization, Including Sub-Categories



On the one hand, this research project proposes that these challenge dimensions are adequate to use in the field of B2B service digitalization and relationship management, as they were verified in a bottom-up approach in the expert interviews and the two case studies presented in this thesis. On the other hand, the contribution of this thesis is to make the generic character of the dimensions more specific by adding sub-elements and rich insights as well as proposing learnings and mitigation actions within each challenge dimension (see Figure 38). This seems to be a value addition, as there is not a generic model of challenge dimensions. This research project proposes a specific framework in the field of B2B service digitalization, including possible answers to challenges in the form of learnings from two corporate organizations (see Case Study 1 and Case Study 2). By presenting in detail the challenges within service digitalization, this research project adds valuable insights in a field where research has only scarcely explored how such processes unfold in practice, especially in the corporate segment, as highlighted by Shree et al. (2021).

This research project proposes a set of phases to explore how service digitalization materializes in practice (see Section 5.1.4). These phases are based on technology adoption and change management literature that is complemented by practical insights into organizational roles, key activities, capabilities, and ways of working offered by senior experts in the field and the studies of two corporate organizations. Providing such contextual depth answers the call of Parida et al. (2019) and Anarelli et al. (2021), who highlight the fact that such insights are rarely researched (see Table 1 & Table 25).

Table 25: Thesis Contribution to Service Digitalization Challenges and Learnings

SERVICE DIGITALIZATION CHALLENGES & LEARNINGS	
Extant Literature 'From'	**My Thesis** 'To'
Generic models in service and technology adoption	***Specific B2B service digitalization relationship value insights*** ***Detailed challenge dimensions, sub-categories, and digitalization phases are offered based on eight expert interviews and two real-life corporate organizations, including 17 key informants.***
General discussion of challenges in digital transformation	
General discussion of challenges in service digitalization	

7.2 Advancing Service Digitalization Adoption and Relationship Management – a Proposed Framework

In addition to Objective 1–3, another objective of this research project is to propose a combined framework that captures various relevant elements in B2B service digitalization management and relationship value enhancement and bring them into a logical relationship. The reasons for doing this, from contributions to practice perspectives, are the following.

First, practitioners in the field receive more than simply a generic theory of the influencing dimensions such as technology, environment, and organization that are undoubtedly important to consider. Instead, they receive concrete examples in the form of elements specific to service digitalization as well as challenges and learnings from two use cases within the efficiency and effectiveness value space (see Sections 5.1 & 5.2).

Second, practitioners receive a framework of service digitalization that extends beyond isolated generic technology adoption. This framework proposes links to relationship value management theory, indicating the effect of digitalization as a technology on relationship value and offering a specific costs-and-benefits mechanism from a dyadic provider and user perspective (see Figure 39).

Third, in addition to specifying what adoption means in B2B service digitalization and offering links to relationship value management, this

research project offers practitioners specific challenge dimensions that they may encounter when deciding on and executing service digitalization activities. These dimensions are explored with real-life examples from experts working in this field and representatives of organizations and their customers. From the perspective of the author, this framework could be used as an end-to-end guide regarding what to consider and be aware of for B2B organizations considering service digitalization. It would be of particular use for companies that are deciding on, designing, and executing their individual service digitalization paths to enhance relationship value. This framework goes beyond existing generic theory regarding technology adoption and insights into B2B digitalization opportunities by offering a more complete picture in the field of service digitalization adoption and by providing specific details from practice (see Table 26).

From a contribution-to-knowledge perspective, the following can be stated. First, the proposed model takes specifications of the TOE adoption model – which has been criticized, in part, for being too generic to explain adoption in detail – and applies it in more depth to the field of B2B service digitalization. Second, the framework links aspects of service digitalization and relationship value that have not been part of previous academic discussion, as the two fields have been discussed separately.

Table 26: Thesis Contribution to Service Digitalization Adoption Framework

<table>
<tr><th colspan="2">SERVICE DIGITALIZATION CONSIDERATION, ADOPTION AND EXECUTION MODEL</th></tr>
<tr><th>Extant Literature
'From'</th><th>My Thesis
'To'</th></tr>
<tr><td>Generic technology adoption model(s)</td><td rowspan="3">Specific service digitalization relationship value enhancement framework

Joint discussion of service digitalization and relationship value

Both offering a more complete picture of what counts in B2B service digitalization</td></tr>
<tr><td>Generic value of digitalization discussion</td></tr>
<tr><td>Isolated discussion of service digitalization aspects and relationship value management</td></tr>
</table>

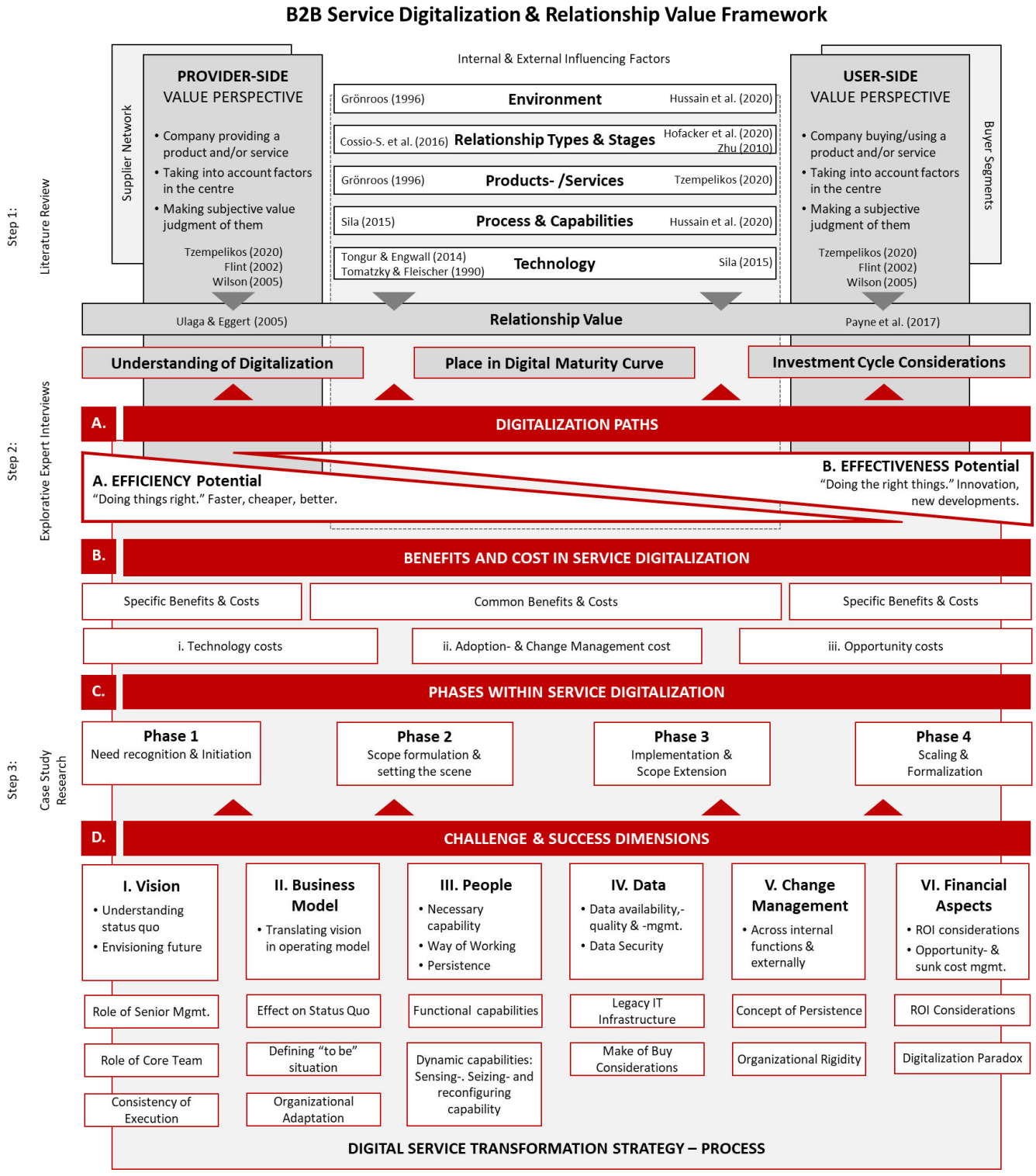


Figure 39: Proposed Service Digitalization–Relationship Value Enhancement Framework

7.3 Limitations and Further Research

This section covers the limitations of this DBA project as well as avenues for future research in the field of B2B service digitalization and relationship value enhancement.

7.3.1 Limitations

Although the research methodology for this study was chosen carefully, limitations cannot be ignored. The research methodologies employed in this DBA project to generate primary data are of a qualitative nature. Despite the numerous activities that were considered to enhance reliability and validity, a statistical generalization of the results to a wider population is not feasible with qualitative research methods (Levitt, 2021; Payne & Williams, 2005).

The first primary data undertaking in this research project was to gather the latest insights into B2B digitalization practices from knowledgeable experts in this field (see Chapter 4). Although these experts may be accepted sources of practitioner knowledge in a certain field (Wright et al., 2012), several questions arise about their validity and reliability, such as when an expert qualifies as an expert, how researchers can approach the issue of subjectivity and contextual ramification (Leung, 2015), and how many experts are needed to reach certain content saturation levels (Baker & Edwards, 2012). Experts in this research project were a particular set of B2B senior consultants of various backgrounds and sectors, having gained considerable experience in the field of digitalization (see Table 5).

However, the disadvantage of having a wide array of experiences can be seen when it comes to the generalizability of the insights generated, as these insights are likely to be the general perceptions of these experts and not specific to one sector only. The sample size of eight experts interviewed would be another limitation factor of this primary research activity. In general, deciding on and justifying a sample size is seen as a difficult process, and there is no specific guideline (Bogner et al., 2009). The researcher makes no claim that, within the eight expert interviews, all possible insights were

extracted, and the content saturation level fully achieved. However, the research method employed was able to capture a broad picture of B2B service digitalization topics. The insights generated were critically compared with the existing literature and the findings were used and confirmed in a subsequent case study.

The second qualitative method employed in this research study was the two in-depth case studies in the field of B2B service digitalization, which targeted efficiency and effectiveness. Although case studies can generate rich insights into a researched phenomenon, the downside highlighted in academia is that they are focussed on a small number of companies, thereby limiting generalizability (Ebneyamini et al., 2018; Yin, 2018). This research project generated insights based on two case studies in the field of B2B service digitalization; Therefore, it must be acknowledged that these insights might apply only partially or not at all to other organizations. The studied companies were chosen for their thematic fit to the research problem and are comparable in size. However, since they are not part of the same sector, no sector-specific assumptions can be made.

Another limitation of this research project is based on the potential interpretive bias of the researcher himself, which can influence the understanding and the interpretation of results which was mitigated by engaging within a reflective process (Saunders, 2016 & Section 3.7). The academic literature has found that it is almost impossible for a researcher not to transfer personal attitudes, beliefs, and/or opinions while gathering, analysing, and interpreting data (Fontana & Frey, 2005; Knox & Burkard, 2009; Yin, 2018). To mitigate this bias risk, the researcher asked case-study participants for validation of challenges, learnings, and phase definitions. In addition, generated transcripts were checked systematically for coding and theme generation with the help of Nvivo 12 to eliminate misinterpretations as much as possible.

When speaking of limitations, one conceptual limitation regarding relationship value itself must be mentioned. Research findings on relationship value as the sum of numerous costs and benefits employed have resulted mainly from

the perspective of consultants interviewed and experts from case-study organizations, who mainly took a provider perspective rather than a user perspective. Although the experts were comfortable taking a user perspective, as they had contact with end-customers (users) in their projects and had worked on several stages up and downstream of the value chain – sometimes for the provider and sometimes for the user – this must be regarded as a potential bias factor. The same can be said for experts who were interviewed inside the providing organizations and were asked to equally take a customer perspective, it must be acknowledged that certain levels of bias are present.

7.3.2 Future Research

Based on the findings of this research project, the methodology employed, the propositions made, and the limitations identified, the following areas are proposed as future research avenues.

I. *Applying the service digitalization and relationship framework in the same and additional sectors*

The framework proposed in this research is based on findings in the literature and insights gained from experts and two case studies – one from telecommunications and the other from the automotive sector. The author wants to particularly emphasize the need for further case-study research in the same and additional sectors with multiple organizations of various sizes, to potentially verify or adapt findings in this research project. Doing so would be enhance the understanding of whether firms approach service digitalization in the same way, whether there any differences depending on the exact position in the digital maturity curve, and exactly what impact this position has. Furthermore, it would be interesting to know whether the framework proposed could be valid for B2C organizations as well.

II. *Quantitively testing cost and benefit categories and subsequent elements in the same and other sectors*

As this research project had a qualitative methodology focus, it is suggested that cost and benefit categories and sub-elements be tested quantitatively. Future research could determine what cost and/or benefit elements exist across efficiency and effectiveness cases across industries. In addition, quantifying costs and benefits in absolute numbers and correlating them to key performance indicators as revenue and/or margin developments of firms taking a longitudinal perspective could be helpful in understanding the economic impact of service digitalization on relationship value.

III. *Testing the outlined 12 propositions by developing corresponding hypotheses and their underlying variables*

Several propositions were made in the primary research part of this thesis (see Table 22). Taking these propositions and developing underlying hypotheses and their variables would be a feasible future research attempt, making them more specific by highlighting certain correlations between variables. Such testing could be integrated in future research recommendation *I.* and *II.* above and could generate valuable insights.

IV. *Testing the practicable use of the proposed service digitalization framework in the circle of service digitalization consultants and other organizations*

In addition to testing the proposed model with other organizations in the same or additional sectors and receiving feedback from organizational decision-makers and programme managers, it would be worth considering testing the practical use for consultants. Consultants are accepted to facilitate managerial knowledge by sharing best practices in the form of use cases and models employed (see Chapter 4.0). It would be interesting to know whether consultants would take up this model and integrate it

into their consultancy practices or whether they might adapt it based on certain logic. Would they simplify it, not to overwhelm potential customers with the complexity accompanying service digitalization and relationship value enhancement? Or would they use this model because of its detailed format for consulting and guiding customers through the complex journey in which they will engage? What would be interesting to consider for consultants would be similar for practitioners in organizations confronting digital transformation challenges. How would organizational transformation professionals react to the model? Would they agree on the foundational elements, or would they see it as too generic even with all the details incorporated and exemplified in corresponding sections?

V. *Validating and extending the findings in this thesis in the light of an extended dyadic perspective.*

This thesis integrated a first dyadic perspective by asking the interviewed consultants to take the perspective of users of service digitalization projects (See Appendix II, Questionnaire). In addition, case studies interviewees were asked to put themselves in the position of the customer and to give feedback. However, as in each case study only one interviewee as from the customer side, with the majority of interviewees being internal to the organisations, an extended customer seems a fruitful avenue to pursue. Further research could potentially provide several new perspectives by asking customers of efficiency and/or effectiveness digitalization endeavours to share their impressions. Impressions categories could be structured along cost- benefits dimensions identified in this thesis. In addition, challenge- and success dimensions could be seen out of a customer position that could help to bring new insights to the transformation journey that includes providers as well as customers.

7.4 Personal Reflection

One of my motivations for undertaking a DBA programme in late 2016 was to fulfil a doctoral research opportunity that I had turned down in early 2010. Then, after completing my master's degree studies, I found myself facing a challenging job market in the aftermath of the global financial crisis, with many companies still cutting costs to sustain their businesses, leaving little room for new hires. My master's thesis supervisor offered me an opportunity to join a doctoral programme he was establishing. After some days of consideration, I declined it with gratitude, as I wanted to gain some practical experience after five years of university studies, despite the fact that only a few job opportunities were available.

It was Christmas 2015 when I was looking back on my first five years of professional experience – having made my way from a general management trainee to a knowledgeable B2B project manager and having passed my first year as a department leader in B2B digital transformation – that I felt something was missing in my life. I realized that I had a strong urge to understand in more detail what I had been doing with digital transformation over those years, taking time to understand 'what', 'how', and 'why' it was happening. Retrospectively, I can say it was a time of a growing dissatisfaction. This dissatisfaction can be partly explained by the fact that I was working in a field that required the delivery on objectives, sometimes no longer questioning whether the objectives were the right ones and whether the ways in which they were executed were the most efficient. Consequently, as I did not seem to find answers in my direct professional context, I was looking for a way to complement my practical experience with additional competencies. This brought me to the DBA programme.

What started out as a welcome diversion to my intense professional job – trips to Sheffield and Munich, studying during the day about 'what is truth?,' and reflecting on that question at night in several pubs and gin bars – soon became a time-intensive endeavour which I highly underestimated in resources invested and psychological stress to be managed. The first two years, which were structured well along numerous modules, were, in

retrospect, the easier period. Being on my own afterwards, having a third supervisor within four years of studies and facing several significant challenges, was another thing. However, it was the strong desire to make a contribution to practice and knowledge that would assist me professionally and that might create a path to a part-time lecture engagement I was envisioning that helped me progress and overcome stressful, cheerful, and sad periods in my private life. These ranged from welcoming two of my three sons into this world and letting go of my father, who died suddenly in early 2022. Somehow, the DBA project became part of life, and life was dynamic.

While writing these lines I cannot be sure whether the results of the past years will be enough to receive the doctoral title. However, with regard to results already accomplished, I can say that the last years have shaped me in a way that I would have not imagined. I realized just few months ago that my thinking somehow has changed. Things I accepted for granted professionally and sometimes even privately were questioned. Since early last year, I am feeling a strong urge to answer the questions ‘What are we talking about?’ and ‘Why is it important?’ every time I am faced professionally with new and sometimes familiar concepts. I know this may seem to be a childish example, but I can state unequivocally that this has been a noticeable effect on my personal way of working. However, simply speaking about the methodological changes my thinking has undergone would leave out the experiences that I was blessed to have throughout the programme. I met fellow students, whom I never would have met otherwise, who I can call friends and who will enrich my life for many years after the completion of this research project. I engaged with academic and business professionals from other sectors on different levels that immensely augmented my understanding of challenges and opportunities in other sectors and fields, for which I am grateful. These conversations, which grew in number over the past 18 months, restored my energy level and I learned a lot.

Now, it is time for others to judge whether this research project has fulfilled the requirement set to award the title of a doctor in business administration. Thank you for your time and interest.

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Zhu, X., & Zolkiewski, J. (2015). Exploring service failure in a business-to-business context. *Journal of Services Marketing, 29*(5), 367-379.

Zhu, Z., Nakata, C., Sivakumar, K., & Grewal, D. (2013). Fix it or leave it? Customer recovery from self-service technology failures. *Journal of Retailing, 89*(1), 15-29.

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Zolkiewski, J., Story, V., Burton, J., Chan, P., Gomes, A., Hunter-Jones, P. & Robinson, W. (2017). Strategic B2B customer experience management: the importance of outcomes-based measures. *Journal of Services Marketing, 31*(2), 172-184.

APPENDIX I – LITERATURE REVIEW PROCESS

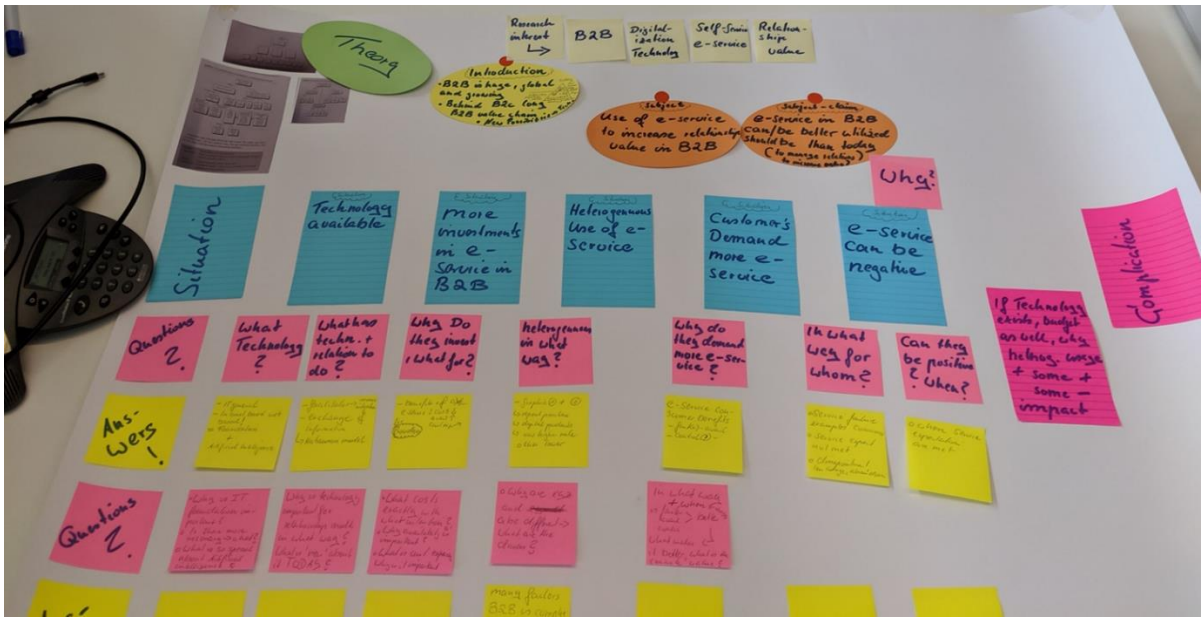


Figure 40: Literature Review Structure Brainstorming / hardcopy draft format - Along 'Pyramid Principle' Dialogue by Minto (2009).

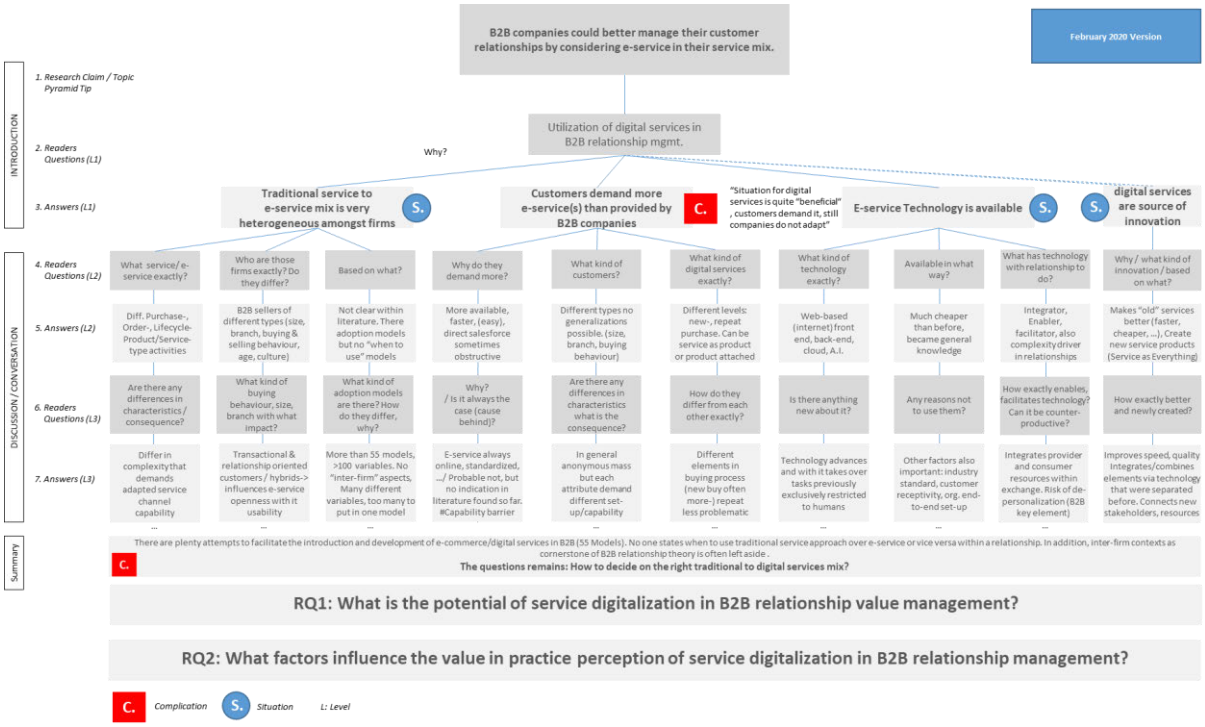


Figure 41: Literature Review Post-Brainstorming Structure / digital extended format - along 'Pyramid Principle' Based on Minto (2009).

APPENDIX II – EXPLORATIVE INTERVIEW DETAILS

0. RESEARCH PLAN (PRIMARY DATA) - USING SERVICE DIGITALIZATION IN B2B RELATIONSHIP MANAGEMENT VALUE MAXIMISATION.

Source: Creswell & Creswell (2018); Patten, M. L. (2016); Saunders et. al. (2016); Harris (2014); Bogner et al. (2009).

01. BACKGROUND:

Digitalization is a heavily discussed topic in academia and managerial practice as it promises new value offerings by making existing services more efficient as well providing new effective service propositions with the help of technology. These technological developments progress at high speed.

However, it is agreed in literature and practice that B2B lacks behind in such developments in comparison to B2C as it is claimed to be more complex in service demands and service buying behavior / procurement and relationship management structures. Up to today there is only scattered and incomplete information available what are the potentials of service digitlaization in B2B relationship management, their value perspective from a service digitalization provider and user side as well as insights on factors that possibly influence the value in practice perspective. This lack of knowledge when introducing service digitlaization measures leads to a mismatch of provider and user expectations and is

02. GOAL/DECISION:

The first goal of this primary research proposal is to identify latest potentials of service digitalization in B2B relationship management in practice and with it possibly support, complement and reflect findings identified in literature.

The second goal is to identify factors that possibly influence the value in practice perception of service digitalization in B2B relationship management from a supplier- and user position.

OUTLOOK (Out of scope in this inital step): Findings of both research goals will be input for a possible future B2B service digitalization - relationship value maximisation framework/model helping B2B companies making better service digitalization decision in their relationship management endeavours.

03. INFORMATION NEEDED:

PRIORITY:

a. List of service digitalization potentials along B2B relationship management cycle.

b. List of benefits and costs of such service digitalization measures from a B2B service digitalization supplier- and user value in practice perspective.

c. List of factors influencing value in practice perception of B2B service digitalization from a supplier and user perspective.

ADD-ON:

d. Insights in latest market developments /-challenges of service digitalization and relationship management in form of best practices.
e. Broad 'practice' feedback on the relevance of the research topic.

04. STUDY DESIGN:

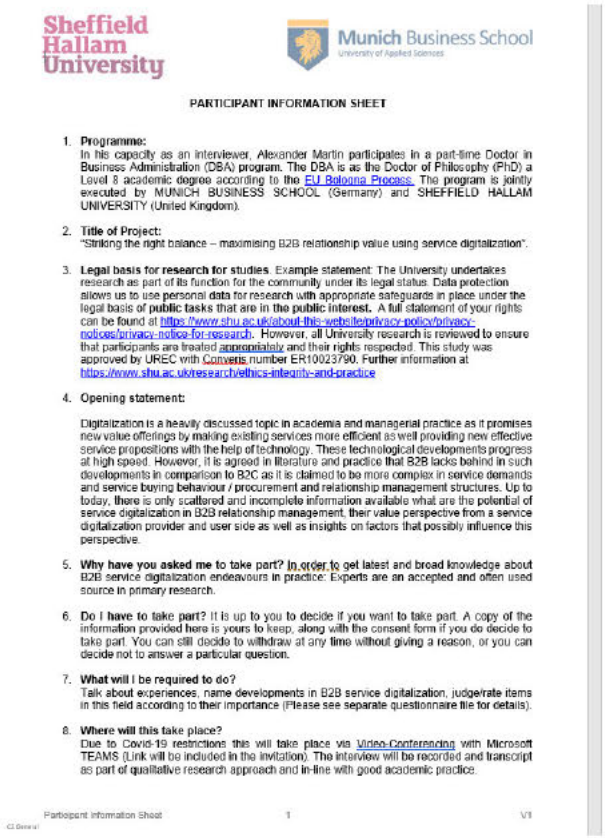
a. Methodology: Qualified approach in form of semi-structured expert interviews.

b. Sample frame: 7-10 interviews (Depending on saturation level) with senior consultants specialised in B2B digitalization and CRM from top tier management & system integration consultancy firms (McKinsey, Deloitte, Ernst & Young, CGI, Accenture).
c. Data collection: 60-90min digital face-to-face interviews via video-conferencing (Microsoft Teams or Zoom), audio-recording (If interviewee agrees).

05. TIMING

a. Questionnaire completion December 2020
b. Interviewee selection and first contact December - January 2021
c. Interview period until end of May 2021
d. Analysis in parallel to interview period

Figure 42: Expert Interview Research Plan



Sheffield Hallam University

Munich Business School
University of Applied Sciences

PARTICIPANT INFORMATION SHEET

1. **Programme:**
   In his capacity as an interviewer, Alexander Martin participates in a part-time Doctor in Business Administration (DBA) program. The DBA is as the Doctor of Philosophy (PhD) a Level 8 academic degree according to the EU Bologna Process. The program is jointly executed by MUNICH BUSINESS SCHOOL (Germany) and SHEFFIELD HALLAM UNIVERSITY (United Kingdom).

2. **Title of Project:**
   "Striking the right balance – maximising B2B relationship value using service digitalization".

3. **Legal basis for research for studies**. Example statement: The University undertakes research as part of its function for the community under its legal status. Data protection allows us to use personal data for research with appropriate safeguards in place under the legal basis of public tasks that are in the public interest. A full statement of your rights can be found at https://www.shu.ac.uk/about-this-website/privacy-policy/privacy-notices/privacy-notice-for-research. However, all University research is reviewed to ensure that participants are treated appropriately and their rights respected. This study was approved by UREC with Converis number ER10023790. Further information at https://www.shu.ac.uk/research/ethics-integrity-and-practice

4. **Opening statement:**

   Digitalization is a heavily discussed topic in academia and managerial practice as it promises new value offerings by making existing services more efficient as well providing new effective service propositions with the help of technology. These technological developments progress at high speed. However, it is agreed in literature and practice that B2B lacks behind in such developments in comparison to B2C as it is claimed to be more complex in service demands and service buying behaviour / procurement and relationship management structures. Up to today, there is only scattered and incomplete information available what are the potential of service digitalization in B2B relationship management, their value perspective from a service digitalization provider and user side as well as insights on factors that possibly influence this perspective.

5. **Why have you asked me to take part?** In order to get latest and broad knowledge about B2B service digitalization endeavours in practice: Experts are an accepted and often used source in primary research.

6. **Do I have to take part?** It is up to you to decide if you want to take part. A copy of the information provided here is yours to keep, along with the consent form if you do decide to take part. You can still decide to withdraw at any time without giving a reason, or you can decide not to answer a particular question.

7. **What will I be required to do?**
   Talk about experiences, name developments in B2B service digitalization, judge/rate items in this field according to their importance (Please see separate questionnaire file for details).

8. **Where will this take place?**
   Due to Covid-19 restrictions this will take place via Video-Conferencing with Microsoft TEAMS (Link will be included in the invitation). The interview will be recorded and transcript as part of qualitative research approach and in-line with good academic practice.

Participant Information Sheet 1 V1

9. **How often will I have to take part, and for how long?**
   One interview of 60-90min.

10. **If deception is involved in the study**
    No information is being withheld or misinformation about the study included, to the knowledge of the researcher

11. **Are there any possible risks or disadvantages in taking part.** No. The interviewee will stay anonymously. All interview information will be stored in a secured IT environment with additional password protection of files which is accessible to the interviewer only.

12. **What are the possible benefits of taking part?**
    Sharing of final results of the study after DBA (Doctor in Business administration) has been published.

13. **When will I have the opportunity to discuss my participation?** Before, during and after the interview.

14. **Will anyone be able to connect me with what is recorded and reported?** No, the source/interviewee will be kept anonymously. There are several processes in place to secure this (Secured private Microsoft Sharepoint page and additional password encryption of files, as well as detached raw data to interviewee personal data file stored in separate place). Within the study the source will be anonymously qualified (Expert from the field "xx" with "z" years experience in "w" sectors).

15. **Who will be responsible for all of the information when this study is over?** The interviewer and academic institution (Sheffield Hallam University - SHU) in alignment with data protection regulation.

16. **Who will have access to it?** The interviewer in accordance with SHU regulation.

17. **What will happen to the information when this study is over?** Data management information including raw data will be kept until DBA is awarded and beyond as basis for possible external publications.

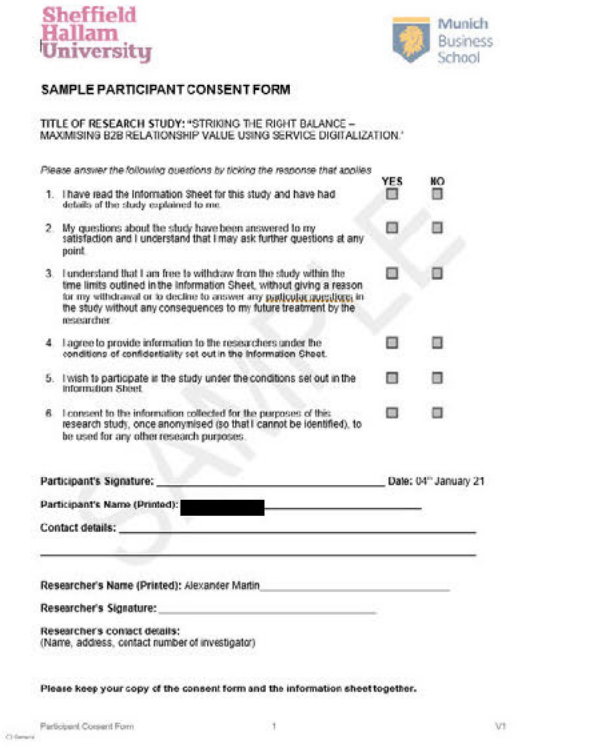
18. **How will you use what you find out?** As primary data input source in my DBA thesis and possibly as basis for external publications.

19. **How long is the whole study likely to last?** The expert interview phase is planned for Q1-Q2 2021. The final thesis is intended to be produced until Q2 2022.

20. **How can I find out about the results of the study?** You will be contacted after results have been finalised and DBA thesis is published (End of 2022 or 2023).

Participants need to be given the opportunity to ask any further questions or seek clarification. This information needs to be provided at the end.

Details of who to contact if you have any concerns or if adverse effects occur after the study are given below.



Sheffield Hallam University

Munich Business School

SAMPLE PARTICIPANT CONSENT FORM

TITLE OF RESEARCH STUDY: "STRIKING THE RIGHT BALANCE – MAXIMISING B2B RELATIONSHIP VALUE USING SERVICE DIGITALIZATION."

Please answer the following questions by ticking the response that applies

	YES	NO
1. I have read the Information Sheet for this study and have had details of the study explained to me.	☐	☐
2. My questions about the study have been answered to my satisfaction and I understand that I may ask further questions at any point.	☐	☐
3. I understand that I am free to withdraw from the study within the time limits outlined in the Information Sheet, without giving a reason for my withdrawal or to decline to answer any particular questions in the study without any consequences to my future treatment by the researcher.	☐	☐
4. I agree to provide information to the researchers under the conditions of confidentiality set out in the Information Sheet.	☐	☐
5. I wish to participate in the study under the conditions set out in the Information Sheet.	☐	☐
6. I consent to the information collected for the purposes of this research study, once anonymised (so that I cannot be identified), to be used for any other research purposes.	☐	☐

Participant's Signature: _____ **Date:** 04th January 21

Participant's Name (Printed): [redacted]

Contact details: _____

_____

Researcher's Name (Printed): Alexander Martin

Researcher's Signature: _____

Researcher's contact details:
(Name, address, contact number of investigator)

Please keep your copy of the consent form and the information sheet together.

Participant Consent Form 1 V1

Figure 43: Expert Interview Participant Information & -Consent Form

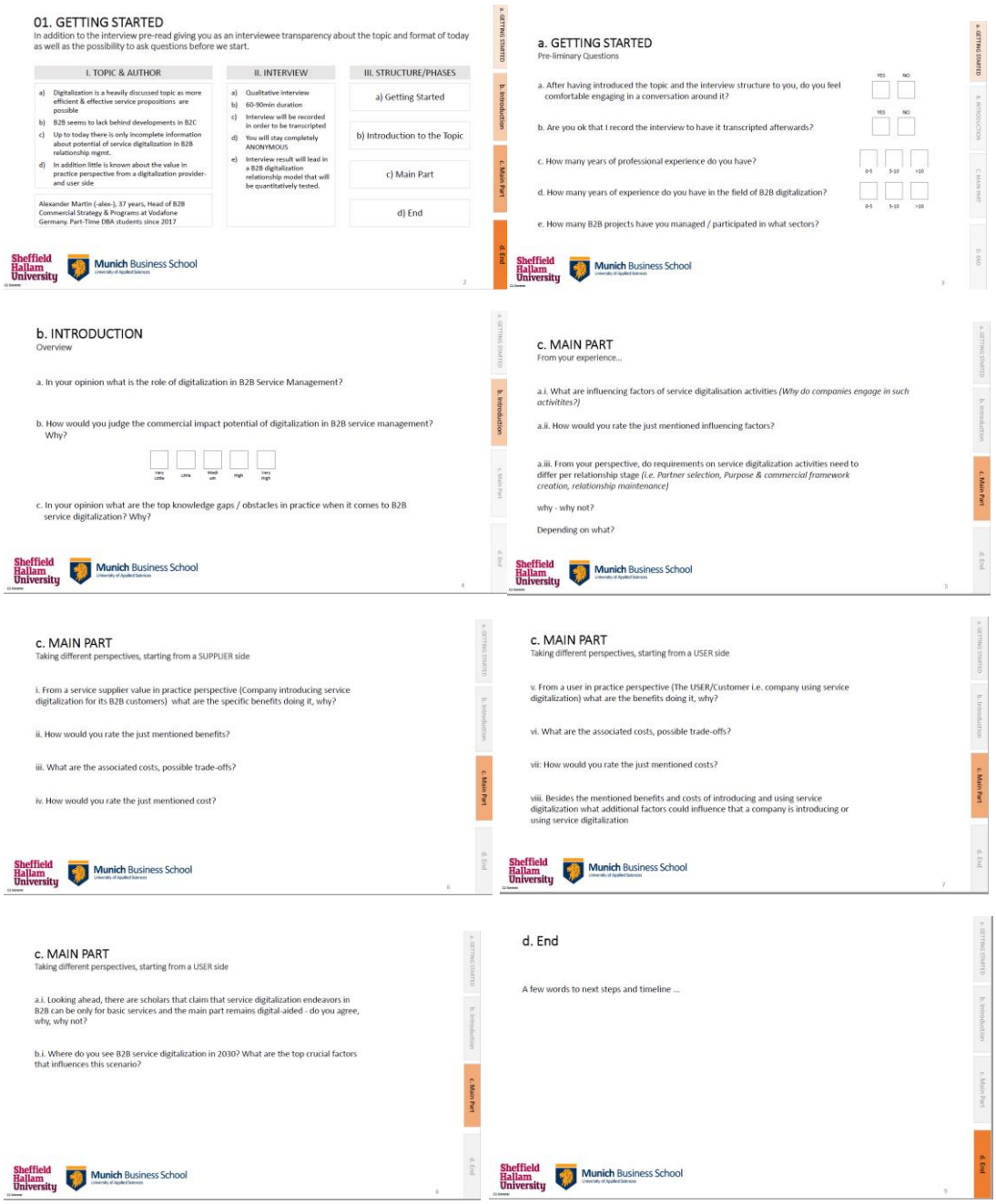


Figure 44: Expert Interviews - Questionnaire

Table 27: Explorative Interviews – Further Digitalization Quotes

Digital-ization Quotes	Consultant 2: *'This idea of digitalization at the core is managing data and the customer. Who they are, everything we want to know about them to help us better serve them. Another aspect is the ability to analyse and apply that data in a way that helps us to make better decision.'* Consultant 4: *'Digitalization is bringing a lot of possibilities to business models … and these topics are still buzz words and so fuzzy that we always have to get into deep-dives what do they want to achieve, our customers and their clients.'*	Consultant 3: *'You know what the client typically thinks which is, I am going to plug in a CRM System or a Pricing system, or you know some other technology and that is it.'* Consultant 4: *'In the beginning it was always a thinking about digitalization of products… and digitalization was always used in the same way by referring to IT standards. So just another word for it.'*
	Consultant 6: *'I think digitalization very much started off as using technology to digitize things, activities, whatever you want channels services. About ten years ago organizations started to realize that it was a little bit more than technology, it was more potentially strategic than that. And I would say for the last ten years up until a few years ago, it was more around the business model and technology combined together.* *I think within the last few years, and it is only really the last few couple of years, we've started to realize that actually, it is a lot more around business agility, the ability of the organization to respond to change, any type of change, and the organizational-cultural working practices element of that. … Some still see it as just the technology, some people see it as a combination of the business model. And some of the, I would say, the thought leaders are starting to understand that it's about the operating model and the culture.'*	

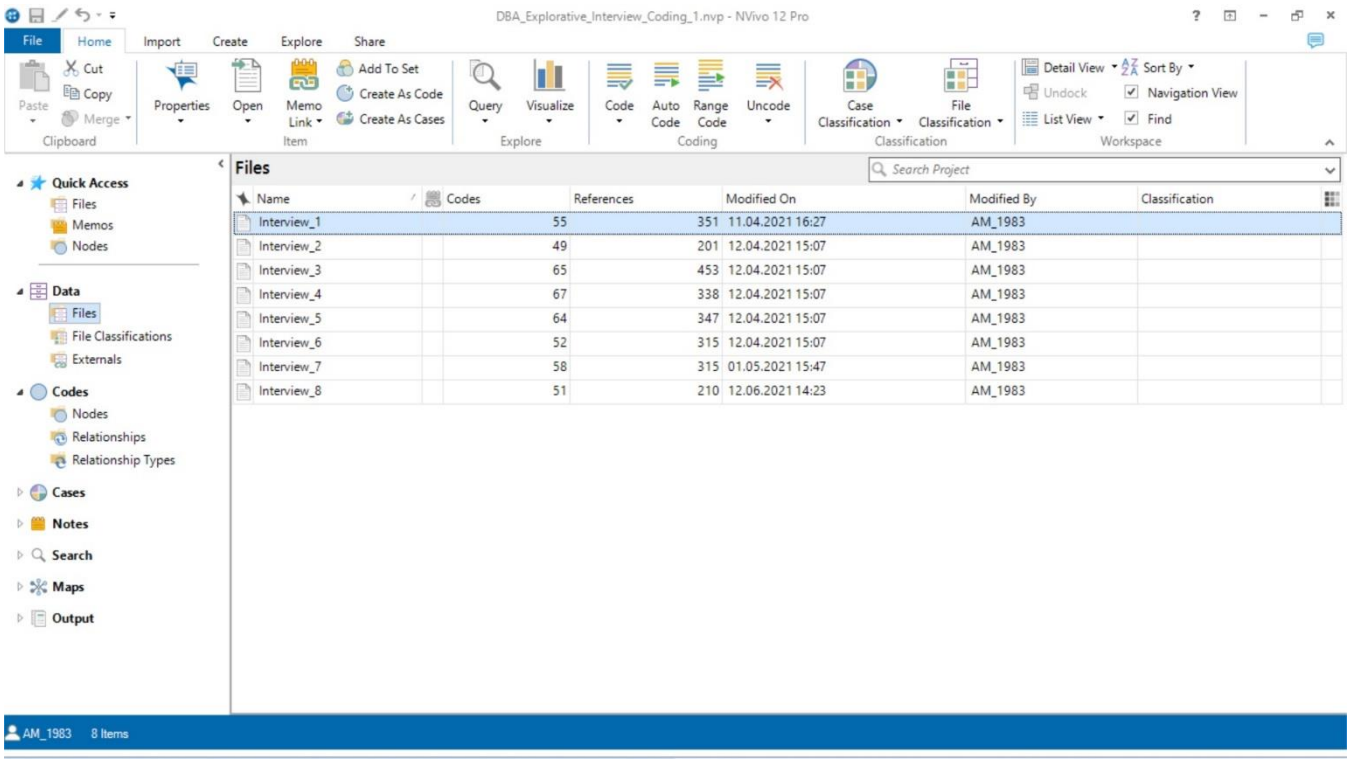


Figure 45: Explorative Expert Interviews Nvivo12 Overview

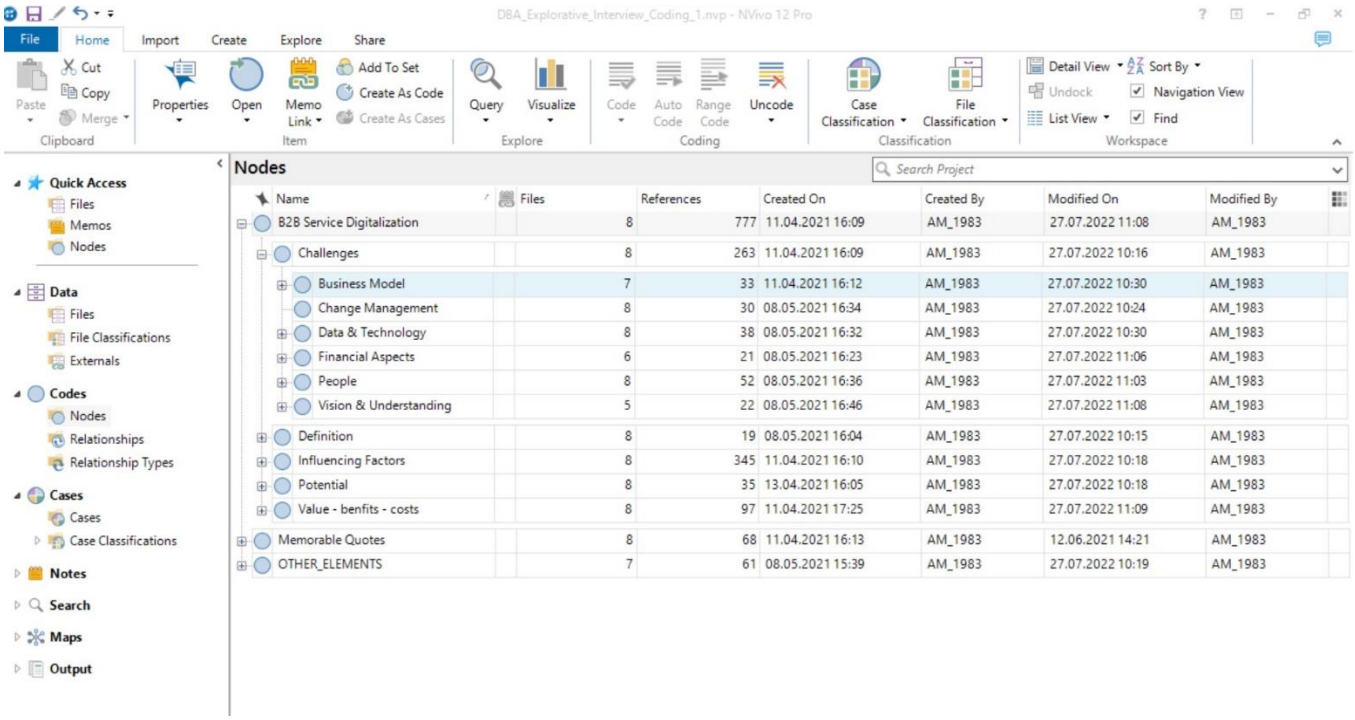


Figure 46: Explorative Expert Interviews Main Themes

ii. Additional Memorable Quotes Explorative Interviews 1

Vision Category:

Consultant 4:

'You need to have a good strategy, you need to have good people, you need to have good processes and then you can start to talk about technology. How will you incentivise your internal service employees to make your clients happier and there is an inter-dependency? So, we call it human experience. So, if your internal people know what to do and are enabled to do business efficiently, clients will be measurable happier as well.'

Consultant 4:

'So, I think the term I use, what a lot of organizations are doing is what I call accessorization. If you think about your house, you buy accessories in the house, right? That just accessorizing the business with new technologies and new ideas, accessorization. Fundamentally people, business-people are looking to make some impact, to make some improvement, and they're desperate for ideas. And

most people aren't great at ideas. So, they'll take either, whether it's a consultancy, a systems integrator, somebody else. They're willing to take ideas, because they just want to look at opportunities to improve where their space is at. So, I think there's a natural thing that people see their realm of responsibility, only think about that, they're open to those ideas and then do something.'

Business Model Category:

Consultant 7:

'*On the one side, it is a transparency question. And so, if you are starting to use digital services, and are starting to get data into the game, then normally you get it to the risks of really getting transparent also to other parties in your ecosystem, which leads to the question, 'Okay, cannot be replaced.' or, 'Can these services be replaced?' So, that is really one key thing. That is always, or is often really seen in a situation when we see in your business entrance for a specific part of the digital service.'*

APPENDIX IIIa – CASE STUDY OVERALL INFORMATION

Table 28: Applying Principles for Interpretive Research by Klein & Myers (1999) in this DBA Project

A. Theoretical Principle by Klein & Myers (1999), p. 72:	B. Application within DBA Case Study
(1) **The Fundamental Principle of the Hermeneutic Circle:** This principle proposes that all human understanding is reached by iterating between considering the interdependent meaning of parts & the full that they form. This principle of understanding is central to all the other principles	• Data was collected successively - in other words after first set of interviewees other interview partners from different field were requested • Continuously iterations between digitalization literature, challenges identified in phase 1 expert interviews (- in other words Vision → Change Mgmt.).
(2) **The Principle of Contextualization:** Involves critical reflection of the historical & social background of the research approach, so that the audience can see how the chosen situation under investigation emerged	• Interviewees were internal as well as external to the respective organization • In case of Efficiency Co. end-users/clients were interviewed. In case of EffectiveCo end-user/clients as well as representatives of external system integrator
(3) **The Principle of Interaction Between the Researchers and the Subjects:** Needs critical reflection on how the research data were socially constructed through the interaction between the participants & the researcher	• Data collection as well all data analysis process was documented in detailed after previously discussion in supervisor team • Prior to interview detailed research on interviewee was undertaken (career, linkedin.com, xing.com) • Besides the official interview rounds several preparation calls took place, where context specific information was shared by key shareholders
(4) **The Principle of Abstraction and Generalization:** Involves relating the idiographic details discovered by the data interpretation by applying Principles (1) and (2) to theoretical, general themes and concepts that describe the nature of social action & human understanding.	• Based on the thematic/narrative analysis and parallel coding a set of themes and theme clusters were developed • Findings were linked to empirical findings from phase 1 and underlying theoretical insights from literature
(5) **The Principle of Dialogical Reasoning:** Requires sensitivity contradictions between actual findings & the theoretical predeterminations guiding the research design & subsequent revision cycles.	• This case study critically reflects the theoretical background building on findings from literature review and phase 1 empirical insights
(6) **The Principle of Multiple Interpretations:** Requires sensitivity to differences in interpretations between participants as expressed stories or narratives of the same sequence of events under investigation.	• A broad audience of interviews were selected covering various areas (Sales, IT, Service etc.) as well as diverse functional levels (Board Members, Senior Mgmt., Programme managers, Communication leads etc. • Besides directly involved, indirectly involved participants were included (clients, workers council)
(7) **The Principle of Suspicion:** Requires sensitivity to possible 'biases' and systematic 'distortions' in the narratives collected from the participants	• To sustain a critical attitude within the themes and narratives collected, continuous cross-checks to other interviewees were made • Possible mismatches were taken into subsequent interviews for verification

Sheffield Hallam University

Munich Business School
University of Applied Sciences

PARTICIPANT INFORMATION SHEET

1. **Programme:**
   In his capacity as an interviewer, Alexander Martin participates in a part-time Doctor in Business Administration (DBA) program. The DBA is as the Doctor of Philosophy (PhD) a Level 8 academic degree according to the EU Bologna Process. The program is jointly executed by MUNICH BUSINESS SCHOOL (Germany) and SHEFFIELD HALLAM UNIVERSITY (United Kingdom).

2. **Title of Project:**
   "Striking the right balance – maximising B2B relationship value using service digitalization".

3. **Legal basis for research for studies.** Example statement: The University undertakes research as part of its function for the community under its legal status. Data protection allows us to use personal data for research with appropriate safeguards in place under the legal basis of **public tasks that are in the public interest.** A full statement of your rights can be found at https://www.shu.ac.uk/about-this-website/privacy-policy/privacy-notices/privacy-notice-for-research. However, all University research is reviewed to ensure that participants are treated appropriately and their rights respected. This study was approved by UREC with Cowens number ER10023790. Further information at https://www.shu.ac.uk/research/ethics-integrity-and-practice

4. **Opening statement:**

   Digitalization is a heavily discussed topic in academia and managerial practice as it promises new value offerings by making existing services more efficient as well providing new effective service propositions with the help of technology. These technological developments progress at high speed. However, it is agreed in literature and practice that B2B lacks behind in such developments in comparison to B2C as it is claimed to be more complex in service demands and service buying behaviour / procurement and relationship management structures. Up to today, there is only scattered and incomplete information available what are the potential of service digitalization in B2B relationship management, their value perspective from a service digitalization provider and user side as well as insights on factors that possibly influence this perspective.

5. **Why have you asked me to take part?** In order to get latest knowledge about B2B service digitalization endeavours in practice case study set-ups (Understanding a specific company in depth) as well as interviews with decision makers, project- & programme implementers as well as functions being affected by change are an accepted and often used source in primary research.

6. **Do I have to take part?** It is up to you to decide if you want to take part. A copy of the information provided here is yours to keep, along with the consent form if you do decide to take part. You can still decide to withdraw at any time without giving a reason, or you can decide not to answer a particular question.

7. **What will I be required to do?**
   Talk about experiences at BUCHER in relation to "BUCHER Connect" and its conceptualization, implementation and utilization i.e. strategic reasoning for it, possible challenges implementing it, first experience after its launch and judge/rate items in this field according to their importance (Please see separate questionnaire file for details).

8. **Where will this take place?**

   Due to Covid-19 restrictions this will take place via Video-Conferencing with Microsoft TEAMS (Link will be included in the invitation). The interview will be recorded and transcript as part of qualitative research approach and in-line with good academic practice.

9. **How often will I have to take part, and for how long?**
   One interview of 60-90min.

10. **If deception is involved in the study**
    No information is being withheld or misinformation about the study included, to the knowledge of the researcher

11. **Are there any possible risks or disadvantages in taking part.** No. The interviewee will stay anonymously. All interview information will be stored in a secured IT environment with additional password protection of files which is accessible to the interviewer only.

12. **What are the possible benefits of taking part?**
    Sharing of final results of the study after DBA (Doctor in Business administration) has been published.

13. **When will I have the opportunity to discuss my participation?** Before, during and after the interview.

14. **Will anyone be able to connect me with what is recorded and reported?** No, the source/interviewee will be kept anonymously. There are several processes in place to secure this (Secured private Microsoft Sharepoint page and additional password encryption of files, as well as detached raw data to interviewee personal data file stored in separate place). Within the study the source will be anonymously qualified (Expert from the field "xx" with "z" years experience in "w" sectors).

15. **Who will be responsible for all of the information when this study is over?** The interviewer and academic institution (Sheffield Hallam University - SHU) in alignment with data protection regulation.

16. **Who will have access to it?** The interviewer in accordance with SHU regulation.

17. **What will happen to the information when this study is over?** Data management information including raw data will be kept until DBA is awarded and beyond as basis for possible external publications.

18. **How will you use what you find out?** As primary data input source in my DBA thesis and possibly as basis for external publications.

19. **How long is the whole study likely to last?** The expert interview phase is planned for Q4 2021. The final thesis is intended to be produced until Q2/Q3 2022.

20. **How can I find out about the results of the study?** You will be contacted after results have been finalised and DBA thesis is published (–end of 2022).

Participants need to be given the opportunity to ask any further questions or seek clarification. This information needs to be provided at the end.

Details of who to contact if you have any concerns or if adverse effects occur after the study are given below.

Researcher/ Research Team Details:

DBA Student/ Interviewer:

Alexander Martin [redacted]

Besides being a part-time researcher at SHU & MBS the interviewer acts currently as a "Head of Commercial Management" at Vodafone Germany, a multinational provider of telecommunications services. In this capacity he can be contacted under [redacted]

Vodafone Germany supports the part-time DBA program; Alexander Martin can use the Vodafone environment (i.e. Laptop, Printer, IT, etc.). The intended research project is not conducted in the name of Vodafone. Vodafone holds no responsibility on the content, execution or any other aspect of this primary research.

DBA Supervisor (SHU): Richard Breese, R.Breese@shu.ac.uk

DBA Supervisor (MBS): Jens Böcker, Jens.Boecker@h-brs.de

You should contact the Data Protection Officer if:	You should contact the Head of Research Ethics (Professor Ann Macaskill) if:
• you have a query about how your data is used by the University • you would like to report a data security breach (e.g. if you think your personal data has been lost or disclosed inappropriately) • you would like to complain about how the University has used your personal data	• you have concerns with how the research was undertaken or how you were treated
DPO@shu.ac.uk	a.macaskill@shu.ac.uk

Postal address: Sheffield Hallam University, Howard Street, Sheffield S1 1WBT Telephone: 0114 225 5555

Sheffield Hallam University

Munich Business School

SAMPLE PARTICIPANT CONSENT FORM

TITLE OF RESEARCH STUDY: "STRIKING THE RIGHT BALANCE – MAXIMISING B2B RELATIONSHIP VALUE USING SERVICE DIGITALIZATION "

Please answer the following questions by ticking the response that applies

	YES	NO
1. I have read the Information Sheet for this study and have had details of the study explained to me.	☐	☐
2. My questions about the study have been answered to my satisfaction and I understand that I may ask further questions at any point.	☐	☐
3. I understand that I am free to withdraw from the study within the time limits outlined in the Information Sheet, without giving a reason for my withdrawal or to decline to answer any particular questions in the study without any consequences to my future treatment by the researcher.	☐	☐
4. I agree to provide information to the researchers under the conditions of confidentiality set out in the Information Sheet.	☐	☐
5. I wish to participate in the study under the conditions set out in the Information Sheet.	☐	☐
6. I consent to the information collected for the purposes of this research study, once anonymised (so that I cannot be identified), to be used for any other research purposes.	☐	☐

Participant's Signature: _____ **Date:**

Participant's Name (Printed): Interviewee _____

Contact details: _____

_____

Researcher's Name (Printed): Alexander Martin_____

Researcher's Signature: _____

Researcher's contact details:
(Name, address, contact number of investigator)

Please keep your copy of the consent form and the information sheet together.

SAMPLE

Figure 47: Case Study - Participant Information Sheet & -Consent Form

Case Study MEET & GREET + INTERVIEW STRUCTURE:

Giving you transparency about the topic and format of today as well as the possibility to ask questions before we start.

I. TOPIC & AUTHOR	II. INTERVIEW	III. STRUCTURE/PHASES
a) Digitalization is a heavily discussed topic as more efficient & effective service propositions are claimed to be possible b) B2B seems to lack behind developments in B2C c) Up to today there is only **incomplete information about potential of service digitalization in B2B** d) **FOCUS:** In addition, it is little known how B2B companies engage in digitalization endeavours, what challenges they face etc. **AUTHOR:** Alexander Martin (-alex-), 38 years, Head of B2B Commercial Strategy & Programs at Vodafone Germany. Part-Time DBA students since 2017	a) Qualitative interview b) 60-90min duration c) Interview will be recorded in order to be transcripted **d) You will stay completely ANONYMOUS** e) Interview result will help to complete a B2B digitalization relationship model	a) Getting Started b) Introduction c) Main Part d) End

Sheffield Hallam University | Munich Business School

a. GETTING STARTED

Pre-liminary Questions – understanding the position of the interviewee

i. Are you ok that I record the interview to have it transcripted afterwards? YES NO
Sind Sie einverstanden, dass das Interview aufgenommen und transkripiert wird?

ii. After having introduced the topic and the interview structure to you, do you feel comfortable engaging in a conversation around it? YES NO
Nach Vorstellung der Interviewstruktur sind Sie einverstanden in eine Unterhaltung zu gehen?

iii. How many years of professional experience do you have? 0-5 5-10 >10
Wie viele Jahre Berufserfahrung haben Sie in Gänze?

iv. How many years of experience do you have/did you have with Vodafone tool? 0-5 5-10 >10
Wie viel Jahre Erfahrung haben Sie mit Efficiency Co. tool?

i.v. What is your current position at Vodafone / was your position when having been engaged with tool? *Was ist Ihre derzeitige Position bei Vodafone? Welche war Sie bei der Einführung von Efficiency Co. tool?*

v. Can you please explain your connection to „Vodafone tool" in detail?
Könnten Sie bitte Ihr Verhältnis zu Efficiency Co. tool kurz schildern?

Sheffield Hallam University | Munich Business School

b. INTRODUCTION

Getting started around Efficiency Co. tool – understanding Efficiency Co. tool as a company and Efficiency Co. tool .

a.i: Please describe briefly the sector Efficiency Co. . is operating in i.e. environment, challenges, competition etc.
Wie würden Sie das generelle Markt- & Wettbewerbsumfeld von Efficiency Co. beschreiben?

a.ii. Please describe Efficiency Co. positioning in the sector i.e. . model, propositions, types of clients & client relations. What is the typical Efficiency Co. . client? Was ist die generele Positionierung von Efficiency Co. . im Markt bzgl. Produkte, welche Kundensegmente adressiert Efficiency Co. ., welche Arten von Kundenbeziehungen?

a.iii. What was the general motivation to implement "Efficiency Co. tool ." as a digital service?
Was war die generelle Motivation bei Efficiency Co. . das "tool" einzuführen?

a.iv. Could you recall any internal and external influencing factors that shaped the decision for "Efficiency Co. tool ." and rate them according to their importance? *Gab es bestimmte externe oder auch interne Einflussfaktoren, die die Entscheidung für Efficiency Co. tool maßgeblich beeinflusst hat – wie würden Sie diese ranken?*

a.v. In your words what are the general benefits of Efficiency Co. tool .
In Ihren Worten, was sind die maßgeblichen Positiveffekte von tool:

i. *for Efficiency Co. tool internally* Efficiency Co. intern
ii. *for Efficiency Co. tool customers?* Für Efficiency Co.-Kunden

b. Model Elements

Understanding Efficiency Co. tool in much more detail

a.i. Who initiated the "Efficiency Co. tool ." initiative/proposition, why? Wer hat Efficiency Co. tool initiiert, warum?

a.ii. What were steps in the decision process? What departments/functions were included in the decision making process? Was waren Schritte im Entscheidungsprozess? Welche Fachbereiche und Funktionen waren im Entscheidungsprozess?

a.iii. Were there any challenges deciding on "Efficiency Co. tool ."? How were they addressed?
Gab es Herausforderungen im Entscheidungsprozess von tool? Wie wurden diese adressiert?

a.iv. What was/is the role of senior leadership team in relation to "Efficiency Co. tool ."? Were there any other functions you want to highlight that were critical to implement "Efficiency Co. tool ."?
Was war und ist die Rolle des Senior Mgmts. Führungsteams im Bezug auf tool?
Gab es andere Funktionen/Rollen die erfolgskritisch waren für die tool-Implementierung?

a.v. Was there a common understanding/vision of "Efficiency Co. tool ." among all departments? How is it now?
Gab es eine bereichübergreifende gemeinsame Vision zu tool?

a.vi. Were Efficiency Co. tool clients involved in the "Efficiency Co. tool ." implementation process?
Waren Efficiency Co. Kunden im Implementierungsprozess eingebunden?

1. Vision
- Understanding status quo
- Envisioning future

b. Model Elements

Understanding Efficiency Co. tool in much more detail

a.i. How would you describe the impact of "Efficiency Co. tool" on the . model of Efficiency Co. . i.e. how does it change the way Efficiency Co. products are created, implemented, sold and maintained?
Welchen Einfluss hat tool auf das . Model von Efficiency Co. . d.h. wie Produkte erstellt, implementiert, verkauft und serviciert werden?

a.ii. Did "Efficiency Co. tool ." make any changes to how things were previously done internally or externally?
Hat tool etwas an der Arbeitsweise von Efficiency Co. . intern und/oder extern geändert?

2. .Business Model
- Translating vision in operating model
- Input- Output factor mgmt.

b. Model Elements

Understanding Efficiency Co. tool in much more detail

a.i. Did Efficiency Co. have all the necessary capabilities (HR functions) to conceptualize, develop, implement and maintain "Efficiency Co. tool"? Which yes, which no and how were the missing capabilities complemented?
Hat Efficiency Co. die notwendigen Fähigkeiten und Funktionen gehabt um Efficiency Co. tool zu konzipieren, zu entwickeln, es zu implemeniteren und zu betreiben? Welche waren vorhanden, welche nicht und wie waren die fehlenden ergänzt?

a.ii. Besides necessary capabilities/functions for "Efficiency Co. tool .", which function where affected by Efficiency Co. tool, why? Will any functions be more or less affected in the future?
Neben den Implementierungsfunktionen, welche weiteren Funktionen waren/sind von Efficiency Co. tool betroffen.

a.iii. Did Efficiency Co. tool change the interplay between different functions such as IT, service, sales or other? *Hat Efficiency Co. tool das Zusammenspiel zw. Verschiedenen Funktionen wie IT, Service, Sales oder anderen geändert? Wenn ja, wie genau?*

a.iv. Were any organizational measures changed due to "Efficiency Co. tool ." i.e. creation of departments, changes in organizational structures or elsewise?
Hat es durch Efficiency Co. tool organisatorische Änderungen bei Efficiency Co. . gegeben wie Aufbau von Abteilungen, Änderungen der organisatorischen Struktur oder andere?

av. Is "Efficiency Co. tool ." regarded as a chance or threat at Efficiency Co. ., are there functions that are in favor of Efficiency Co. tool . and others that are more critical? Why? Wird Efficiency Co. tool als Chance oder als

3. People
- Necessary technical & mgmt. capability
- Inter-function alignment

b. Model Elements

Understanding Efficiency Co. tool in much more detail

a.i. What impact did Efficiency Co. tool has on the approach und usage of data?
Hat die Einführung von tool die Rolle von "Daten" bei Efficiency Co. . geändert? Wie Daten technisch generiert warden oder auch kaufmännisch ein eingesetzt warden, neue Anwendungsfälle etc pp.

a.iii. Was there any change necessary towards technologies used at Efficiency Co. . to manage data with the implementation of "Efficiency Co. tool ."?
Gab es eine Änderungen bzgl. Nutzung von Technologien mit der Einführung von Efficiency Co. tool?

4. Data
- Data availability , quality & -mgmt.
- Data Security
- Data philosophy

b. Model Elements

Understanding Efficiency Co. tool in much more detail

a.i. What was new to Efficiency Co. when introducing "Efficiency Co. tool"?
Was war generell "neu" für Efficiency Co. . bei der Einführung von Efficiency Co. . ?

a.ii. Did Efficiency Co. . initiate any special change management activities to implement "Efficiency Co. tool"? Which ones, what was the intention?
Hat Efficiency Co. etwaige Change Mgmt. Aktivitäten implementiert bei der Einführung von Efficiency Co. tool? Welche waren das und was waren Hintergründe?

a.iii. What were main challenges when introducing tool? Did any unexpected challenges arrive when deciding, implementing or maintaining "Efficiency Co. tool"?
Was waren die Hauptherausforderungen bei der tool Einführung? Gab es auf dem Weg unverhergesehene Herausforderungen, welche waren dies und wie wurden diese gemanaged?

a.iii. Taking a retrospective perspective would you have done anything different implementing "Efficiency Co. tool"? What exactly and why?
Rückblickend, was hätten Sie bei der Einführung von tool anders gemacht, warum?

5. Change
- Across internal & external functions
- Change Mgmt.

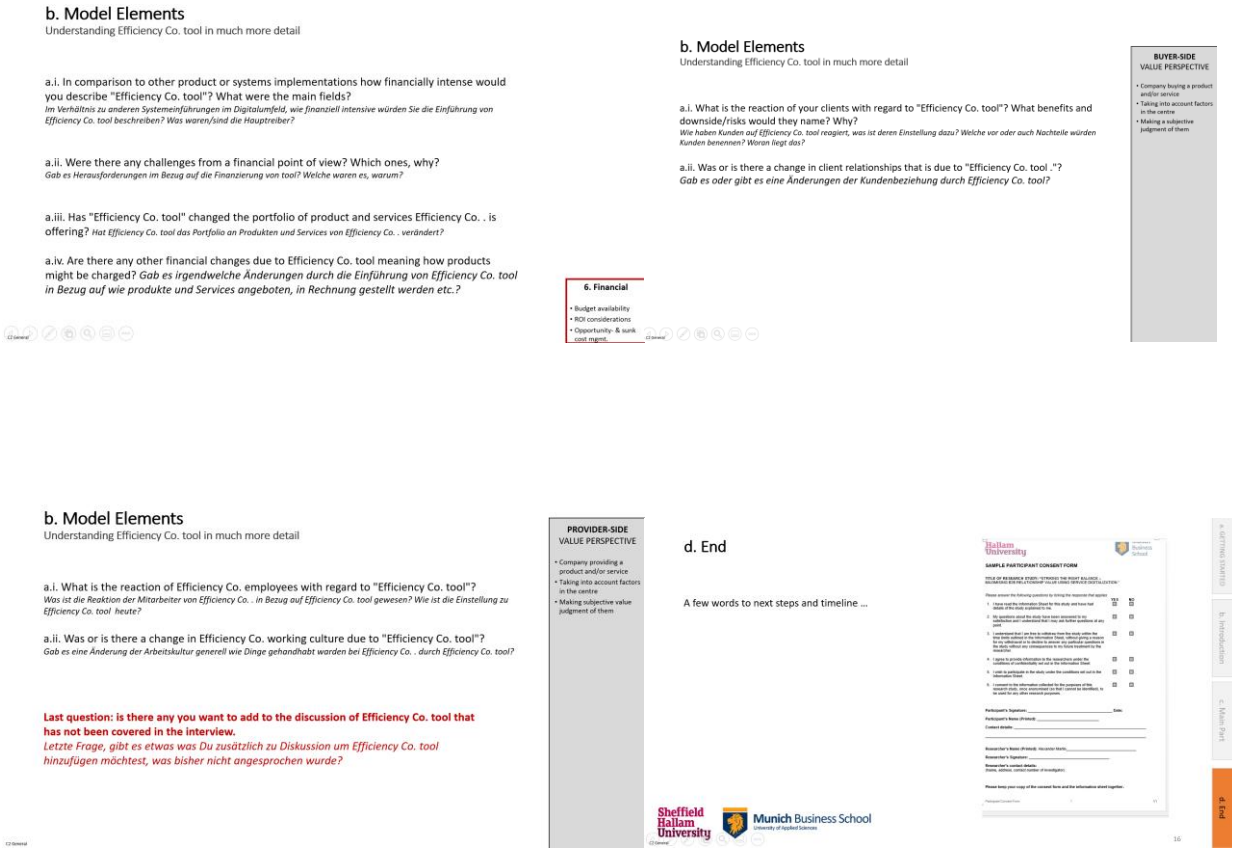


Figure 48: Case Study 1+2 Questionnaire

APPENDIX IIIb – CASE STUDY 1 DETAILS

i. Case Study 2 Nvivo-Details

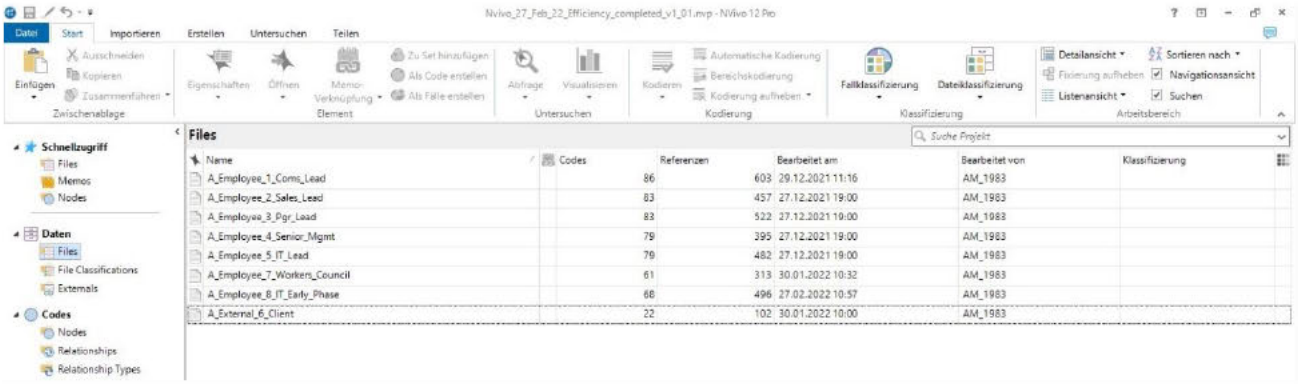


Figure 49: Case Study 1 - Nvivo Extract Efficiency Co. Input Sources

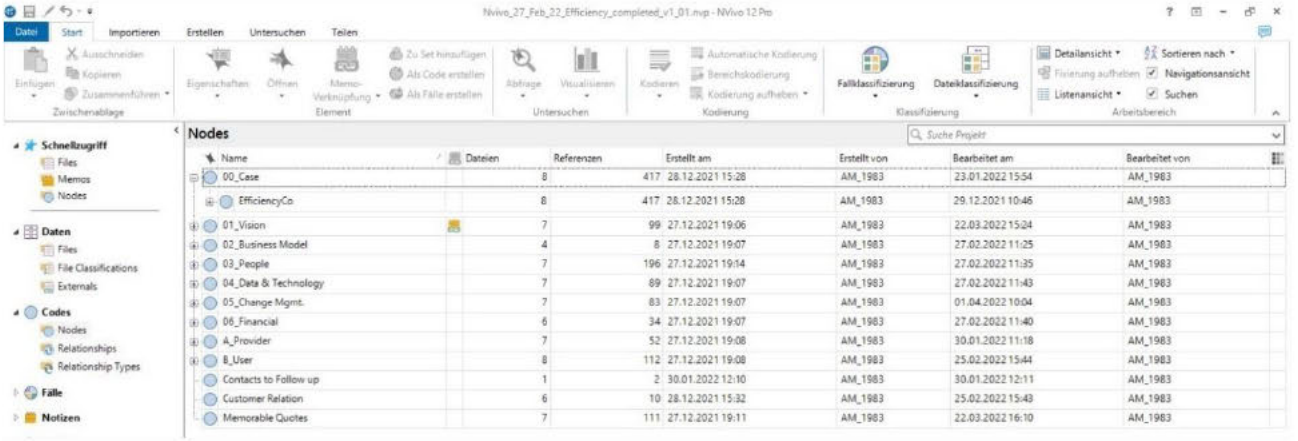


Figure 50: Case Study 1 - Nvivo Extract Efficiency Co. 1st level Nodes

iii. Additional Memorable Quotes Case Study 1

Provider Benefits Quotes:

'Previously these [Standard requests] had taken so many resources within the internal departments, most of all service operations, but also within sales. And indeed, with the self-service portal we really got that very well managed.'

*(*Interview 2 - Front-Desk Capacity Optimization category).

'The huge advantage for us was that orders did not come in on paper or by fax or e-mail but in a structured way that could be used to automatically process it instead of doing it manually.'

*(*Interview 1 - Higher quality & speed category).

User Benefits Category:

'There is the §147 within the German Code of Commerce … within that it is stated that contract details have to be traceable, unaltered and retrograde transparent … meaning that from the initial offer to its fulfilment and backwards everything has to be transparent and comprehensive.'

(Interview 2 – Transparency category).

'You do not need to provide the necessary human capability and capacity in the moment of the service request … You decouple the moment of demand from the moment of human resource availability.'

*(*Interview 2 – increased Availability, Quality and Speed category*).*

User Costs Category:

'Customers were partly highly sceptical in the beginning in a way: Do you want that we do now your work? What is this nonsense? Why can't we receive the service the old way anymore?'

*(*Interview 1 – User Costs category*).*

‘Efficiency Co’s digital service tool, it has to be said, is just an add-on yes? Efficiency Co. does not do that out of fun, no company does that out of no interest but because they want to save costs by hiring less service managers … From my perspective it is just an add-on.’

*(*Interview 7 – User Feedback category*).*

Vision Category

‘Well Mr X. (a pseudonym) was the burner. He could amazingly sell the topic on his level, communicating a consistent vision to board members, building a strategy always making his point that this is the right thing to do and that this has his full commitment.’

(Interview 9 – Senior Management Vision category).

‘The mantra we had was that we were deeply convinced that this was the right direction for the organization. And we were also convinced if we can convincingly transport this vision, we can spark the flame and when the flame becomes a fire than people go the extra mile and do things with a handshake.’

(Interview 3 – Core Team Vision category).

People Category

‘What was new was that we have learned on the way what we can give the client in its own responsibility and what not.’

(Interview 2 – People & Way of Working category).

Technology and Data Category

‘We analysed how customers came along with the tool, what and how activities they are doing. We always compared how many mobile phones were order by whom. … And we always asked ourselves: Why do they still order mobile phones the old way if they could do it with the tool?’

(Interview 3: Data & Technology category).

Effectiveness Journey

‘We closed ranks among us, we clearly prioritized all efforts along the customer demand. We came to a point that we could formulate a common vision what are the basics to fix and what to hand over to IT for implementation.’

(Interview 3 – Memorable quotes category)

Table 29: Efficiency Co. Digital Service Implementation Roadmap

	Phase 1 *Need Recognition & Initiation*	**Phase 2** *Scope formulation & setting the stage*	**Phase 3** *Implementation & Scope Extension*	**Phase 4** *Formalization & Scaling*
A. Period	2010-2011	2011-2013	2013-2017	2017 - 2022
B. Narrative	Realising that something must be done to stay competitive and that it will not be with internal resources only.	Successively defining what must be done. Getting first part-time internal resources in place.	Delivering first use cases and enabling internal employees and customers in parallel. Slowly ramping up volumes. Establishing organizational structures.	Harvesting benefits on broader scale. Building new functionalities in parallel. Being faced with complexity constraints.
C. Challenges	• Market demands not fulfilled • Realizing IT legacy debt • In house project realization estimates too cost intensive • Rigid IT organisation • External hosted applications seen critical • Unsure outcome / high risk throughout all mgmt. and employee levels	• Securing internal resources • Major technological issues - in other words legacy, complexity • Massive organizational scepticism • E2E business process complexity • Disconnect between core project team & 'as is' service organization	• Huge change mgmt. efforts to compensate internally & externally – double work • Benefits invisible/cannibalised due to portfolio extension • Demanding stabilisation phase as new ways of working • Learning by doing causing including setbacks	• Toll no competitive advantage anymore, more commodity. • Complexity becomes critical & hard to cope therefore architecture
D. Learnings	• Senior Mgmt Support main key success factor • Strong vision & storytelling necessary to kick-off project and provide resources • External IT realization as feasible still challenging path	• Senior Mgmt & core team as change agents as success factors • Forging alliances on several levels as key success factor to secure resources • Integrating customers important	• Senior Mgmt core team and extended alliances are key success factors • Broad communication helpful • Use case delivery & positive benefits perception • Suddenly positive momentum in all organization	• Long amortization timeframe
Overall developments	• Internal and external acceptance continuously improved over time driven by use case benefits & senior management and core team change management efforts • From unconventional project set-ups to make a first start piloting new ways of working to more formalized structures to scale on volumes (Customers engaged, activities done digitally)			

Table 30: Transformation Practices at Efficiency Co

	Process Element (The 'what')	Practice Element (The 'how')	Practice examples:
1.	End-to-End Vision Creation & Distribution	**Creating a top-down convincing digital vision and excessive storytelling and spread it by truly dedicated change agents in all stakeholder fields.**	Senior Service Manager as top management change agent to initiate the process and maintain support throughout the whole process. Core project team with representatives that are accepted peers having many internal connections with all stakeholder groups stakeholder fields (sales, service, technology, …).
2.	Consequent Decision making	**Combining formal ways of organizational decisional making processes with informal ones.**	Preparing formal decision-making formats as board meeting to address resource demands with informal formats as 'coffee alliance' ta ks. Leaving 9 to 5 standard business hours setting to find solutions to heavy challenges 'after work' formats.
3.	Focus Business case delivery	**Making digital not a nice to have option but a mandatory obligation to deliver on business cases even against heavy resistance.**	When digital use cases were technically stabilised, manually options of doing the same thing were successively reduced and finally reduced. As internal and external stakeholders were all affected some being still sceptic up to unwilling huge change mgmt. efforts were necessary.
4.	Formalization of delivery structures	**Transferring a dynamic project set-up successively to organization structures.**	Creation of own department owning the digital service initiative. Centralizing of many of the functions from initial project set-up.

APPENDIX IIIc – CASE STUDY 2 DETAILS

i. Case Study 2 Nvivo-Details

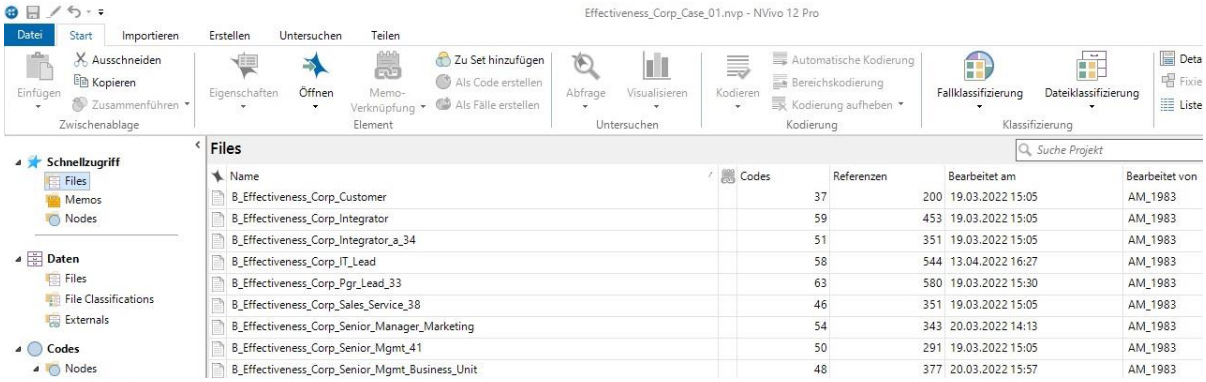


Figure 51: Case Study 2 - Nvivo Extract Effectiveness Input Sources

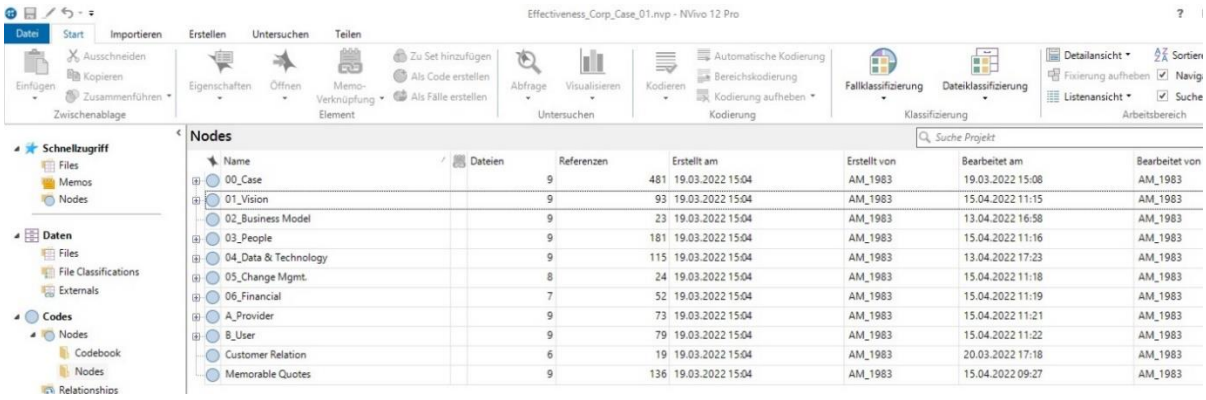


Figure 52: Case Study 2 - Nvivo Extract Effectiveness 1st Level Nodes

ii. Additional Memorable Quotes Case Study 2

Influence Factors Category:

'Our competitors don't have such a platform as we have it. But we know that everyone is working on that. Everyone tries to tap into field of service extensions as they have realised: 'Hey within this service business you can still grow and if there is a crisis one could have an additional income'.'

(Interview 2 - Motivation to implement category).

Provider Benefits Category:

'The digital service platform can support relationships. It is not just about when I have to change the oil or the brushes or tires and so on. We can talk of something else than the unit itself as process optimization etc.'

(Interview 2 - Provider benefits category).

Cost Category:

'Within this project you don't really know what you get at the end of the day. You don't know all the cost even if you do all the calculations. There is much more risk included … and that is where our management is uncomfortable because they don't have the experience with things like that.'

(Interview 2 - Provider Cost to implement category).

Vision Category:

'…maybe we are not really engaging deep and bold enough with the topic as we should be. We are focussing too much on the next functional release instead of the bigger vision 'that is where we want to go, that is where we absolutely have to go' aligning everyone behind that idea.'

(Interview 2 - Vision category).

People Category:

'The top three success factors were first of all to ramp-up a solid core project team, number two to have the overall top-down backing to really execute and that the project includes all necessary departments not just production but also service.'

(Interview 2 - People Capability category).

Table 31: Effectiveness Co. Digital Service Implementation Roadmap – Main Scope, -Challenges and -Learnings

	Phase 1 *Need Recognition & Initiation*	**Phase 2** *Scope formulation & setting the stage*	**Phase 3** *Implementation & Scope Extension*	**Phase 4** *Formalization & Scaling*
A. Period	2015-2018	2018-2019	2019-2021	2021 - 2022
B. Narrative	Increasing number of external and internal influencing factors promoting digitalization and increasing commercial pressure.	Initiating the project. Realizing technological challenges. Appointing internal part-time resources & engaging external partners in parallel and securing budgets.	Managing technological and capability as well as cultural challenges. Having the first MVP & use cases live.	Realising that technical functionalities alone is not enough to scale.
C. Challenges	• Service digitalization vision seen as totally new thing • Heavy organizational scepticism	• Outdated Telematic IT legacy • Missing digital platform expertise • Appointing internal resource • Limited financial resources • Difficult to decide in which fields to partner and with whom to partner • Different opinion on Business Case drivers internally	• New way of working internally • Creating organizational understanding / acceptance • Heavy IT challenges – data cleaning & flows • Heavy legal demands / data privacy agreements • Limited financial resource • Still different opinion on Business Case drivers internally	• Customer adoption difficult (bugs, loosing trust) • Fulfilling initial business case expectations • Scaling existing use cases in volume • Finding service use cases to increase volumes • Limited financial resources • Make or buy discussion • Integrating older generation vehicles • Fossil fuel to e-technologies challenges • Vehicle data integrity • No USP anymore, other competitors release service features
D. Learnings	• Service Digitalization of commercial relevance	• Building up expertise what is needed (more than expected)	• It is more than technology it is about process, culture and stamina • Technology platform need service process model / use cases • Constant customer engagement important	• Technology platform and services modules alone not sufficient to scale • Constant customer engagement important – paying customer have much higher expectations
Overall developments	• Implementing stable core project team seen as top key success factor throughput the project timeframe			

Table 32: Comparative View of Provider- and User Effectiveness Benefits and Costs

Value Elements	Provider Side	User Side
A. BENEFITS	• Commercial benefits: new service as a product to generate revenue streams; competitive advantage in the market • Processual gains: data driven insights to make better engineering decisions; increase of technical service centre productivity etc. • Deepened customer relationship: new fields to tap in from product selling to solution/process optimization conversations	• Operational gains due to increased transparency: fleet mgmt., routing and analytics - in other words Comparison fuel consumption & optimization measures. Reporting of location and activity levels of machines • Operational gains due to better customer service: Reduction of down time • Fulfilling compliance/reporting demands: documenting areas cleaned by machine • Decreasing commercial obligation risks & maintenance risks: reducing customer claims by digital documentation of usage/mis-usage of machinery, warranty extensions if machines is operated in certain perimeters.
B. COSTS	• Data Infrastructure costs: exchanging telematic system, developing digital service platform • Implementation cost: Program Mgmt costs, • Maintenance costs: maintenance fee for system integrator servicing the platform • Cost of learning: sunk costs due to change of decisions • Supporting cost & Cost to transform: Communication, change mgmt. Activities as trainings and workshops, legal advisory/Consulting on GDPR etc., hiring technology lead	• Cost of learning: resource investment in time and/or staff to learn to use and to use the digital platform • Cost of digital service modules: licence fees for using the digital service platform. • Cost to adapt 'way of working'

APPENDIX IV – TRANSCRIPT EXTRACT EXPERT INTERVIEW

Recording Expert Interview

I: And now everything we say is recorded. I would start like, move to the next question. After having introduced the topic and the interview structure to you, do you feel comfortable engaging in a conversation around it? #00:00:13-0#

R: Yes. #00:00:14-9#

I: Thanks for that. May I ask you, how many years of professional experience do you have (Person)? #00:00:21-9#

R: More than 10. #00:00:22-4#

I: More than 10. How many years of experience do you have in the field of B2B digitalization? #00:00:28-6#

R: Also more than 10. #00:00:33-5#

I: Could you like more or less quantify how many B2B projects in the field of digitalization have you managed, and in what sectors, more or less? #00:00:45-2#

R: So actually, I did work on B2B digitalization project in telecommunications and manufacturing and retail. And all in all, we are talking about like somewhere five to 10 projects. #00:01:11-8#

I: Okay. Thanks for sharing. And so, already like the first page done, I would come to you now to the, I would call it like main part of the interview. And the structure will be like, we will start in a very general discussion about digitization, and we will dig dive deeper then in the next pages. So, may I ask you, from your experience, what do B2B customers understand by digitalization in general? What would you say? #00:01:40-2#

R: So, when you are using the word customer, you are talking about not the seller or

the producer, but actually the people, the users addressed. #00:01:54-2#

I: No. I mean your clients, when you did your B2B/. #00:01:58-7#

R: Clients, it is clients? #00:01:59-1#

I: Ja. #00:01:59-6#

R: Okay. What do B2B clients understand by digitalization? I think the classical areas when they think about digitalization is the sales process. So, how can we enable sales? Oh, online mostly. So, like B2B commerce. And of course, another important topic that depends also a little bit by industry is support actually. So, how can I reduce load on my actual customer service host basically? So, that is the key area that they are thinking of. #00:02:54-3#

I: Okay. And in comparison, coming to question number two, what would be your understanding or definition of digitalization? #00:03:02-5#

R: I mean, these two areas are important. I think we are talking about the digitalization of a customer touchpoints, both for sales and service. But of course digitalization, if you take it literally it also has something to do with the way that you deliver these services. So, it is also something internal to the organization. And there is also always a heavy lifting involved in enabling advanced features for the customer experience at the touchpoints, for example for cross channels.

But if you think it through, you are always talking about when you go into digitalization, you are talking about opening your sales channels. And you are opening, talking about new business models, new sales models. So, you are talking about opening new revenue streams. #00:04:02-2#

I: Okay. You just touched like the topic of sales and service. If we would take this service piece, in your opinion what is the potential of digitalization, especially in the B2B service environment? #00:04:16-8#

R: That of course depends on the industry you are talking about. And as always, I mean the key thing is always the complexity of the product that we are talking about. So, are you talking about well ja, even in the B2B area, there are sometimes very standardized products, almost like fast moving or commodity goods where the B2B model is maybe about adding value by certain packaging, or certain distribution services. So, the potential there is different from if you are talking about very customized sales and service, where it is really very specific.

You have very specific contracts that you need to fulfill, for example in the manufacturing in the automotive #00:05:16-3# industry, for example. So, the potential to say the natural potential for digitalization and B2B service environment is, definitely, well it is always the same. It is reducing costs and improving customer experience actually by automation, because you try to standardize on the customer case management basically. And ja, I guess that is the headline. It is, the potential is mainly and meanwhile, I need to say meanwhile, in automation.

I think if you would have asked the same question like five years ago, we would have also talked about more fundamental things like better fundability of stuff, like better access, better transparency of what is available and so on, right. So, but I guess that we are a little bit over that step already. Is that the answer you were looking for, or the type of answer? #00:06:31-0#

I: Now exactly for me, it was important to address the point like, is that just one potential now that you are differentiated with there like basic things you can do, and they are more complex things. So, we are not talking of one thing, so on different pillars. But you say all in all, if we touched it too, it is the same thing, like automation and things are one of those unclear#00:06:51-1#, so thanks for sharing. It is like, you got the point, so to say. #00:06:54-6#

R: Ja. Okay. #00:06:56-2#

I: Ja. And we talked about, or you just shared some thoughts, like what is possible

and what you can do. How would you judge like the commercial impact of such things in the B2B service environment? Would you say it is very little, or very high, or anything in between? What would be your opinion? #00:07:16-1#

R: The answer is, of course that depends by the degree of standardization that you can enforce or apply, right. So, but overall if I have to give one answer, I would argue it is pretty high. #00:07:33-4#

I: Okay. When you take a look at the project you did within the B2B environment on digitalization, and you said like five years ago it was one thing, nowadays it is already like a different approach, what would you say nowadays what are the top knowledge gaps or obstacles when it comes to B2B service digitalization? Or what are the obstacles which is in the projects you face with your clients? #00:08:03-1#

R: Ja, I sound like something that you can read on the internet, but it is well, it is from my experience, it is just true. So, I think the main obstacles are of course, within the organizations, within the client organizations, it is a way of organizing, a way of thinking, customer orientation, thinking outside, and understanding what the customer wants. So, you need in order to be successful in digitalizing communications with the customer, you need to know how you do this, and you need to have an organization that is geared towards this, right.

So, that is one thing. So, this whole like soft skill area of mindset, culture, customer orientation. And I think the other obstacle #00:09:03-4# is really on the technological side. There are many you know established enterprises that are coming from also from an IT perspective, from a very silo model, they are working on large backend legacy platforms that are hardly accessible, not to speak of web accessible. So, you are talking about heavy architectural lifting.

As you always are talking about, how can I pull the data and the business functionality that is built in these old systems? How can I make it available and accessible at the front end in the performance manner? And that is often a huge, a huge, huge task. #00:10:03-9#

I: Okay. You said like there are the soft skills that are the understanding of an organization to go into the understanding like process, and you have the technology challenges, any other things you would add, or would you say that are the two main pillars? #00:10:20-4#

R: I think one thing is also clear, but maybe this is part of the cultural challenge that you have is, with everything that you take into the digital space, with everything that you pull out in the open if you like, you are increasing competition, right. It becomes totally visible to every customer how your organization performs in comparison with many others. And it is more prevailing for B2C, but it is also increasingly a topic for B2B that people compare. #00:11:01-5#

I: Okay. #00:11:04-0#

R: So, you are increasing, so in many instances going digital it is not only because you have chances or opportunities, it is also because it is a defensive thing, because you have to, because the others are doing it. #00:11:19-6#

I: Okay. That is something I think we will touch as well on the next pages. If I come to the next question. So, I think the first question on this page already goes in that direction. So, what would you say, what influences the decision of a B2B companies, or one of your clients why to engage in such service digitalization activities? You just mentioned already competition. So, but are there any other factors? #00:11:44-8#

R: Ja, I mean directly related with competition is of course customer expectations, right? There are certain standards that are set also from the B2C space so that you must not underestimate that the people acting in B2B roles, like people purchasing something, or ja, they are also privately using the internet for commerce, for example of a service. And they have certain, this has set certain expectations on how you deal with a company also in a B2B area. So, there is customer expectation.

This is also that is the expectation for a channel that can be used, it is an expectation

for a certain service level and transparency, the unwillingness to be told by the enterprise how to do something, but to on the other hand say, "Okay, if you can provide us the level I want it, then I go somewhere else." So, this competition #00:12:44-2# customer experience thing is tightly related. But of course, there is also the upside of all of this. And that is yes, it is a possibility to have a differentiator, another differentiator.

The way that you deal with your customers online, it gives you the possibility to introduce new models. It gives you the possibility to open new channels, for example next to a B2B channel, open a B2C channel, right. That is much easier if you do it online. There is the possibility also, as we said in the beginning to cut costs, because you open the possibility to automate incentivize things. #00:13:30-3#

I: Ja. If I would ask you like to rate those influencing factors, so would you say, "Okay, this one would be my number one, my number two, my number three?" Or would you say, "They are all equal level?" What you mentioned. #00:13:43-8#

R: I think that really depends on the individual case. And of course, especially in B2B, especially when you are talking about (Organization), right. You know in (Place), we have many world champions that are actually not huge enterprises, but you know (Organization), that it depends also to a great degree on the character of the owner, right. And you know, whether do something out of prestige, or they have the feeling, "I need to do something here." Or whatever.

So, but I would say that if you do it overall, if you take a look at it overall, I think then I think the key driver is still, I think the most important things are meeting customer expectations and cutting costs. #00:14:47-2#

I: Okay. I am now coming to the next question. When we talk about such, I will call it service digitalization activities, do you think the relationship aspects of a B2B relation are important? I will give you an example, like there could be relationship status or the lifecycle stage, could be like the customer was buying for the first time a service, or receiving a service, or on the other side there are customers who are with the

company for many years.

Would you say, like when considering digitalization activities in the service sector, like that is important to take into account, but would you not say that it is important? #00:15:31-0#

R: Of course it is. Of course, because especially if you are talking about a digital customer touchpoint, it is you are basically, I mean effectively you let the systems do the talking for you, right. I mean it is ja, it is a self-service situation. So, it is especially important to account for the fact that customers coming to your site, for example come with different needs, depending on which life cycle stage they are in, and what experience they already made with you.

So ja, you need to definitely account for it, and you will be more successful if you can meet the customers' requirements. And for this, you need to understand what they need and which stage of the customer journey. #00:16:29-9#

I: Okay. #00:16:31-6#

R: Definitely. #00:16:33-2#

I: Ja. So, maybe we touched already the next question, I was like asking like okay, you have this previous history maybe of a client, and you know in which lifecycle phase he or she is, would you say there are other relationship aspects that need to be touched? You described it as that you need to understand the client, but would you say, could you make a bit more details to that, or bringing more details to that? #00:16:57-1#

R: Ja. I mean, in a way you could answer, you could put no, have a long answer about this. Like it is not only the history that the customer has worked with my company. It is also, of course the objective situation that he is in, so, or she is in. So, how many products does he or she need? Whatever, what the setting is in the respective industry, very different depending on what your customers really are,

right. But you need to understand what their set up is. So, you need to have a holistic view of the customer.

I mean, independent of my relationship with him, right. Whether the last call was he got angry or not, that is not what I am talking about #00:17:57-3#. I mean, this is also an aspect, like a sentiment, right. But it is also his objective situation, and what is relevant to him? I think that is the key point in the discussion sir. Other than that, of course, I mean there are also enterprise concerns. Like ja, I need to have a clear understanding, and that is probably the same as with B2C, how much business do I have with this customer, and how much does it cost me?

Like, you know is it a low value customer, or do I put more effort in and so on and so on? So, this is of course I need to have a clear view of what the value for me is in this relationship. So, you need to have that data available. You need to be able to say that. I am not entirely sure whether this is what you meant by this. #00:18:55-5#

I: No, I can already tell you it is hitting the nail. How do you say in English? So, that is very good. Thank you. I understand that like you are soaking a lot around the thing okay, understanding a client, what is his setup, what is relevant for him? So, that is in the question like on the paper. But like, can I ask you, when you go to a new client, what are you checking to find out what is relevant for him? So, what it is like, how do you check his setup? What you just mentioned. Could you share a few details if you may? #00:19:26-0#

R: So, I need to ask, am I now talking about clients or customers? #00:19:32-4#

I: The client, let us say you do/. #00:19:34-0#

R: The client. #00:19:34-7#

I: You do at (Organization) consulting on project at a client could be (Organization) or medium enterprise or something else. So, I think you said like, "Okay, I need to understand the setup of this client, what is relevant for him." So, what are like so the

key things you are asking, what are the domains or topics you are hitting to get a first understanding, if I may ask? #00:19:55-7#

R: Ja, of course. I mean that is also, you can do it almost a little bit like a checklist. We touched on many areas already. So, the question is, what is the current status? What are your current sales channels? What is the status? How do customers interact with you over those sites? And you know may I say in brackets, we have been mostly talking about pure digital touchpoint, like a website for example, or an app or something, but you also have the same problem around non-digital sales.

Like for example, if you are selling through (Organization), you have people running around sales agents. Sometimes you need to digitalize them as well in order to be more successful. So, you need to understand the sales channels, and how #00:20:55-1# they are selling on it. What is the perception of the customer? So, what is the feedback you are getting in your customer service channel? So, what is the most complaints you get, for example? Right.

What are people worried about? Where do they find that you are too slow? Where do they find you do not make them the right offers? Where do they find that you do not meet their requirements? Of course, then the service channels themselves. So, what is there and how does it work? And then I would definitely take a look at the technical side. I mean, I am also from a company that you know works with technology. So, it is also the question is, how do I enable all of this? What does it take you to provide the information?

Can you provide the information that you want to? And what is your view on the customer? And what are you feedback loops? Like, you know how do you control that what you are doing makes sense for the customer and for yourself. So, how do you measure it, how do you track the business performance? #00:22:11-4#

I: Okay, thanks. Would you believe that digitalization activities, as you just like explained change a B2B relation? #00:22:21-5#

R: You mean between the client and the customer? #00:22:27-6#

I: Ja. #00:22:28-2#

R: Do they change it? Ja. Ideally yes, actually. Ideally, yes. Because if you do it well, I mean we talked about the goals, right? If you do it well, the customer feels served better. He gets more relevant, quicker information. He gets more relevant, quicker products from you or services. You make proactive suggestions how he could even improve, and to do it for yourself with low cost. Okay. That is not something that is a relationship itself, it is affected directly by. But I may also add one thing also for the previous question.

And I am not entirely sure when you are talking about digitalizing B2B, there is of course a whole area that we have not talked about yet so far, which I would also talk about, and that is the whole purchasing model. So, my own supply chain, so like what do I need to organize in order to get my services out to my customers, right? But that is in a way also the same with B2C. So, I am probably sure you do not want to talk about that, because that is also a digitalization aspect that could have immense effects on your ability to deliver and to offer what the customers want. #00:24:05-2#

I: No. Let us talk about it. So, I find it, I think the English term is like upstream and downstream digitalization. So, upstream would be like the source as I am, as let us say, in your term client receiving services and products, which I need for my internal production to create something I will put to my customer. So, you say maybe it is not enough to think about, it is me and my customer. No, I need to talk about, or think of my supplying activities as well, because like they need to be enabled as well in order to do maybe those digitalization things I want to that my customers are using it.

So, you are saying I have to go upstream so to say, to make downstream digitalization as well. So, it is all interconnected. And that is at least my interpretation. #00:24:54-9#

R: Yes, definitely. If you are, depending on how deep your value chain is, right, if you have you know not such a deep value chain, and you are working more in an ecosystem, then definitely in order to enable yourself to offer better services to the customer, you need to also digitalize your supply chain. So, the upstream partners that you have that is for sure, but that is a little bit also the same with B2C. So, that it is not a big difference I would say. #00:25:32-7#

I: Ja. So, it is an aspect to cover. So, thanks for sharing and pointing it out. #00:25:37-1#

R: Ja, it is. It definitely is. #00:25:40-1#

I: Ja, I would come to the next page, and I will first explain to you the structure to make it a bit maybe more clear. I would like that we position ourselves, or you position yourself in the head of a B2B supplier. It would be like in our terms and your client, and then answer a few questions. On the next page, we will put ourselves into the hat of his customer, so to make like we already touched it a bit, like one dimension, one perspective of the supplier I want to call it, and the other one of the end customer I want to call it in the B2B environment.

So, if we put ourselves in a B2B supplying hat, so the company who is introducing this digital service, what would you say from this service supplier where you are in practice perspective, what are the specific benefits of doing this? So, what is in for the company supplying the service to digitalize, what would you say? #00:26:38-9#

R: Ja. As I already mentioned, so I think if you do it well, you will cut down your costs. If you do it well, you will strengthen your relationship with your customers. And if you do it well, you learn a lot more about your customers, which will help you also make more relevant for example across an upsell offers. And of course, you know enable you to increase the loyalty of the customer. And again, because you learn more about your customers, depending on the business you are in, you might also by gathering this data, be able to provide new services, right? You open new business models, for example. I mean, this is very abstract, but ja, it is an approach.

#00:27:40-3#

I: Okay. You just like costs reduction, strengthen relationships, learn more to get new valued stream so to say, what would you rate? Which one would you rate on ranked first, or what would be second rank? Or would you say they are on equal level what you just mentioned? #00:27:59-5#

R: I think the key thing is that you are enabled to serve your customers better, so it is a competitive advantage. And ja, so ja. And actually, also one additional thing that you might have is, if you do it well, you also reduce the load of boring routine work for your workforce and all that. This is always a sort of an ambiguous argument because you could also translate it into you can lay off people. But my understanding, from my perspective that it is not even so much what happened.

It is really that people are freed up to do more creative stuff and to think more about improving that relationship. So, I do think that if you do it well, that you also have benefits even for your internal organization. #00:29:08-3#

I: Okay. When we would come to costs risk and maybe possible trade-offs, what would you say, what are possible costs risks, and trade-offs when introducing or applying a service digitalization activity? #00:29:24-2#

R: So, first of all, I do not think that you have a choice unless you have a monopoly and customers need to come to you. I do not think that you have a choice in thinking about, do I digitalize or not? Because as we talked about earlier, customer expectations are like that. And I think you are soon out of business if you do not do it that way. And I think for example, we see an example for this is actually government in (Place), right? They have a monopoly on many services they provide, and that is the reason why they are lagging behind in terms of digitalization by I do not know 50 years or something.

So, if you are in the commercial area, you cannot normally, unless you have something really special you can offer, and you normally, you do not have the

choice. So, what are the #00:30:24-2# costs and risks associated with it? Well, we said you are putting things out in the open, and it makes it much harder to hide that maybe you do have a lousy customer service organization. That you have I do not know a century year old IT systems that are not able to provide the data and the quality on time. But maybe your portfolio is totally cluttered.

And without somebody next to you explaining it to you, or I do not know one thousand page catalog, people do not have a chance to find what they are looking for. So, we will make it transparent. And if you have problems in your internal organization, or in your portfolio and stuff, you will expose it. So, that is definitely a risk. And of course, if you are sitting on an outdated technology backend, and you are sitting on an outdated organizational model, it will also be very costly, and you will run the risk of failing projects.

And I do not know, next to 10 un-accessible systems in the backend, you introduce the 11th one, right? So, there is definitely also a lot of money you can draw in these initiatives if you are in a bad shape already. #00:31:58-6#

I: Okay. You just said like the different risks associated here. So, the same question, would you rate one of those on number one, or what would be number second or third, what would you say? #00:32:12-3#

R: I think the highest risk is if you do not have, what is sort of the right English word, if you do not have a suitable product portfolio. So, if you have an outdated portfolio for whatever reason, because you have different departments that have been involved in the development of products that really do not want to let them go, or different people are responsible for different stuff. And there is no overarching hat that is able to make decisions, because there is this lack of governance in the organization, or whatever the reason is.

If nobody ever cleaned up your portfolio, you will put it out in the open, and you will make it very difficult for customers to #00:33:12-3# interact with you as you will have ja, it will be very difficult. I think that is the worst actually. I mentioned it earlier, also

in order to make it easy for customers to do business with you, you need to have a clear concept what your products are, and how you want to communicate them to the customer. So, the products are especially if you go digital, the product structure is what you need to concentrate on.

And I do not know, I think the first thing that (Person) did when he came to (Organization), was he reduced the portfolio to like four products or something. Now that was not B2B, right. But I think you understand what I am saying. So, you need to have a clear structure. #00:34:11-8#

I: Ja. That is an interesting point. Would you say it could be a strategic decision not to digitalize the more outdated your well, let us say portfolio and possibilities are, somehow? #00:34:26-8#

R: As I said, I think you do not have a choice. I would rather say your problem is your portfolio, and the digitalization that is just posted out painfully in the open. But so, I do not think that it is you know not digitalizing fixes anything. It does not fix your problem. It only, I think it is a downward spiral if you let yourself be paralyzed by this model. The point is more if you like it or not, the internet is a fact and digitalization is a fact. So, you are not working under the same conditions any longer than 20 years ago. So, you need to adjust.

And one part of it is you need to adjust your portfolio. You need to do that anyway. You do not have a choice, unless you are a monopoly and you can stick to it, or people in tech with you, but that is normally not the case. #00:35:29-1#

I: Okay. Thanks for sharing. If we would now go and change perspective taking now the B2B user side, or we would say the customer side of your client, the same question. So, like what would be then for the B2B customer using this digital service? What are the benefits, why this company should do it and could do it? #00:35:56-6#

R: I think the key advantage that the internet and digital customer touchpoints has brought to all users, be it B2B or B2C is compatibility. That is exactly the key thing.

Because you now have access to this wealth of information, meanwhile, even through aggregator, right that already saw it for you and say, “Hey, here we have laid it out for you.” You see it all the way in the B2C area, but it is the same in the B2B area as well. You have all kinds of marketplaces and comparison tools there as well.

I mean, it depends a little bit on the on the industry, but this is very prevalent. And people start buying in the B2B area, they start buying from (Organization), right. So, your (Organization) is competing with #00:36:56-5# (Organization). That is a fact, whatever. So, that is the key thing. So, they are much, much more informed than they used to be 20 years ago when they made a contract with you because they happened to run into you on some trade fair, right. So, that is one thing. The other thing is of course, I mean all the conveniences that it brings to do something digital versus analog, right.

So, you automatically have a history. You have a much better overview of what this current status of your subscriptions, your service with this company is, you normally can use, can reuse lots of the stuff that you used last time again, to make the next order for example. So, this is a key thing especially in B2B, like where you have a lot of replenishment orders and #00:37:56-6# regular business, like ja, it is a key thing that you do not have to refill a (Organization) formula again in your paper catalog. Also, findability, one key thing, like ja, I have this particular piece that I need to replace, because it is broken.

And my very complex machine that I bought in 1974, it is not even on the market anymore, but this is the successful model. And this is the part, and this is the explosive, explosion, what is the English term? Ja, explosion sites. No. Ja. You know what I mean? That this is the graphic and I can locate it here. So, whatever? So, this makes it, this is totally more convenient than anything else if you were hanging on a telephone with a sales agent. #00:38:50-8#

I: Okay. From all the benefits you just mentioned, how would you put them in order? What would be like first, second, or third? #00:38:58-9#

R: Ja. As I said, I think the key thing is compatibility. And the next thing is ja, convenience. I would call it convenience. So, everything is made much more easy for you. Also, in choosing the channels you want, like this cross channel thing and so on, you can choose how you want to interact, at which point in time. And if they are really good in digitalization, they even reach out to you proactively. So, it is just great. #00:39:31-7#

I: Okay. Could you mention any costs risks, or tradeoffs from a user perspective? #00:39:41-0#

R: Ja, I mean of course, if you are looking at a really deeply integrated model in some of the B2B areas you do, you have especially in manufacturing or something, you have like integration of catalogs, like PunchOut (Organization) stuff, you know of course this costs something, you need to implement it first. On the other hand, once you have done it, it is also extremely convenient again. No, I do not think that there is a drawback. It might be that I need to train my workforce to use the digital channels now. Okay.

But on the other hand, if the digital touchpoints are designed well, then it also should not be too complicated. So no, I do not really see much drawback from the customer perspective. I do not see it. #00:40:56-4#

I: Okay. No, that is fair enough. We talked a little bit about like costs and benefits from a supplier perspective and a user perspective. Could you mention anything which could influence a company to introduce service digitalization besides costs and benefits? #00:41:16-5#

R: You mean? Ja. I mean, I think we mentioned it already, so I think there is, it is just the fact that customers expect these channels. So, it is a competitive thing. And I would not even call it a competitive advantage. It is something that you need to do. It is almost defensive. Of course you can, if you do it while you can turn it into a competitive advantage, right. And there is also cost savings. That is all. I think I would repeat myself. #00:42:08-4#

I: Okay, good. Thank you. #00:42:11-6#

R: Or I am not entirely sure what you were looking here, because you asked the same question earlier, so I guess I am missing the point of it. #00:42:20-3#

I: It is sometimes too, maybe something new comes to your mind, even if you pose the same question after having talked the other topic. So, it is just like ja, you just you mentioned the same thing, which is absolutely fair enough. You can call it, it is a control question or whatsoever. It is just part of the game, I guess. There is no worries. #00:42:40-9#

R: Okay. Okay. #00:42:42-6#

I: Ja. We are already coming to the last page of the interview. Maybe a claim, looking at there are scholars that claimed that service digitalization activities in B2B can be only for basic services, and that the main part remains digitally aided. Would you agree on the statement, or not? #00:43:05-8#

R: I think that totally depends on the, I need to repeat myself, I think it totally depends on the industry and on the complexity of the product. That is the key thing about it. And if you have customized manufacturing for example, like you are ordering something extremely specific, and I have like I produced one of it, right then this is probably something that will not be too digital, right. But as soon as I have a certain scale in what I am doing, and of course this is helped by not making it too complex, I think there is not a good reason why you would not be able to digitalize it.

If you are talking about applying #00:44:05-5# for credit, for a loan, right or you know as a business customer at some bank, it could be a very standardized thing, which can be pretty digitalized, especially if they already know you. But if you are you know you are (Person) and you are talking about billions that you have, and you are talking about billions of debts that you have, then probably you will not serve yourself over the (Place) bank digital channel. Ja that is true.

But I think we are talking about really the 14% the tip of the iceberg. So yes, literally ja. The definition of basic. Well, I do not agree with the main part. I do not think it is the main part that remains only aided. #00:45:06-0#

I: Okay. So, basically it is like, it depends. And you outlined how to do it. Okay. Thanks. #00:45:12-3#

R: Of course, I might be sorry to add that. There might of course there is always, when you do something like this, or when you have this wave, this digitalization, there is a confirmation going through all the industries. And you have the 86% of the iceberg that is digitalized, right. Then of course, this opens always the chance for niche markets, you know where you say, "Okay. But I have these very special customer that absolutely do not want to go digital. And they really want this personal relationship."

And then you can also make a business model out of it and say, "This is not digital. You can call me anytime and I will come over to you." But this will then have a surprise, right? I mean, but this is not what I would call the main part. That is a niche model. #00:45:59-9#

I: Okay. So, if I understand it right, you would bind it, or it depends question would be circled around okay, what is the case, or what is like the product or service complexity you said? Is it like scalable? So, I would interpret scale as value. #00:46:16-7#

R: Yes, yes, yes. #00:46:18-6#

I: So, a bit like ja, it was not so interesting for many people on the basis of it is standardizing characteristics, so to say. And you will bring in the personal touch besides the product, you would say the customer, you need to understand the customer again. And there are those customers who might be like using digital, but there are also those who say like, "No, I just do not want." And you, as a company,

you need to decide, "Do I trust them then with other vehicles?" And then just the full digital fledged self-service, so to say. #00:46:48-9#

R: Exactly. But I would rather consider this as the exception and not the rule, it is the statement of the scholars seems to indicate. #00:47:00-8#

I: Ja. Okay. Thanks. Where would you see like B2B service digitalization in 2030? And what would be like the crucial factors influencing that scenario? #00:47:13-5#

R: I think in 2030, we will have even more automation, and we will have more automation, and especially also on, how shall I put it? In interactions where we have unstructured data like speech. So, I think we were talking about more conversational commerce, and also in further conversation service that is based on certain AI models of qualifying interactions, and pre answering #00:48:13-1# them, pre intelligent routing, and stuff like that. So, I think the degree of automation will even increase, and the extent of channels that we like to think of human channels, like for example email conversation and stuff like that. So, everything that runs over speech.

I think we will also see that goes more back into the upstream thing that I think the ecosystem will be more evolved. And people will have specialized much more on their niche service that they are contributing to some aggregators that will pull together several services from partners in order to deliver a unified experience to the customer. Now, this is very abstract. But what I mean is, I think the ecosystem will be. will be even more evolved and even more differentiated. Let me put it that way. So, more automation, and even more diversified value chain. And ja, I think that is the key difference. #00:49:32-3#

I: Okay. If that will happen by 2030, so what needs to be addressed that that is really happening, that this has a chance to develop? What would you say are the crucial factors that need to happen in the next years? #00:49:45-5#

R: I think apart from what I mentioned in the beginning, like you never, you can never stop learning what your customers want. So, understanding your customers and

promoting the soft skills of outside in thinking, and you know taking everything from the customer perspective, apart from that, much of it is technology. Because I think it is there is a really close relationship between business and technology. Because the key thing about this will be two things, a much more subs oriented technological architecture, so you can actually manage all these different capabilities independently. And second, what I also already mentioned, feedback loops, right?

You can measure the performance of these services, and also of your portfolio, and how things work out. And if you are able to measure the outcome, then you also have the possibility to apply AI models in order to optimize how these things work together. So, this is key. You need to be able to measure digitally what the result is. Otherwise, you do not have a chance to do this kind of organic improvement that is associated with the idea of introduction of AI. #00:51:20-7#

I: Okay. So, if am to interpret it, it would mean like okay, you have in technological basis, on which one there will be several processes running, let us say like in service and so on, and you need to measure everything, what is happening there too. If I get that right, to get a better understanding of the client, and everything that is happening, and then translate it back in. So, besides the technological thing and the measuring thing, is it like some kind of translation? And do you mean that like with business to technology backward loops? #00:51:56-6#

R: No, I am not talking about the backward loops in terms of translation. I am really thinking about measuring outcomes, measuring with us directly. So, that could be very different depending on what service or what functionality you are talking about, but if you are providing a certain service, you need to be able to say afterwards, if I change this parameter, if I change that parameter, what effect does it have on the customer? What effect does it have on the quality of my service, whatever the KPI is that you are measuring, right?

And if you are not able to do that, and that is often currently missing, especially from the customer back to the client, then you have a hard time automating anything. #00:52:50-0#

I: Okay. No. Thanks for explaining. Coming to the last question of today. Is there anything you would like to point out with regard to B2B digitalization in the field of relationship that has not been covered in this interview so far? #00:53:06-0#

R: No. I think you basically pumped everything out of me. #00:53:16-0#

I: And I thank you so much that you shared with me that. So, if it is okay for you, I would stop the record button. Here we go. #00:53:26-0#

[End of interview] #00:53:26-0#