



Digitalization in SME: A Framework to Get From Strategy to Action

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"Master of Business Administration"

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Affidavit



I, **Gudula Feichtinger**, hereby declare

- 1) that I am the sole author of the present Master's Thesis, "Digitalization in SMEs: A Framework to Get From Strategy to Action", 99 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and

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Abstract

"Digital Transformation" is shapeshifting the business world but there are a couple of questions, not the least, what the term exactly stands for and what it implies for companies. How can SMEs, representing almost 49% of revenues and 44% of gross value added in Austria, benefit from it? While large companies have the resources to invest, and small startups are positioned at the heart of digital transformation, SMEs seem to lack both: They have neither the financial and personal resources, nor the agility, to assess the chances and the necessities of digitalization.

In this thesis, a common framework is established for Small and Medium Sized Enterprises to provide them with a way to strategically deal with the challenges of digitalization. The digital strategy framework presented is particularly suitable for SMEs. It addresses specifically the question of what a process needs to include to enable the implementation of the strategy afterwards. The framework describes the three-step process (digital reality, digital ambition, digital roadmap) along six relevant dimensions of digitalization. For each step, the relevant actions and results are described. The strategy framework also lists the relevant output of the process. It stresses the importance of easily understandable, visual aids ("digital roadmap") to communicate the strategy (vision, goal, projects).

The process and the related elements, as well as the relevant dimensions, were extracted and synthesized from existing frameworks and verified in expert interviews. The expert interviews give insights to questions not answered from the existing frameworks, in particular addressing the results of the strategy process in the form of defined projects and timelines. The digital strategy framework was then presented to four SMEs to validate its usefulness.

The framework is of high practical value for any company that starts a digital transformation or needs to coordinate its digitalization initiatives. It is helpful for both SMEs and consultants as a guide in the strategy development.

Keywords: Digitalization SMEs, Digital Transformation, Digital Strategy, Digitalization Framework

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List of Abbreviations

| | |
|--------|---|
| BM | Business Model |
| DACH | (D)eutschland (Germany), (A)ustria, (CH)Switzerland |
| DMA | Digital Maturity Assessment |
| DT | Digital Transformation |
| ICT | Information and Communication Technologies |
| MVP | Minimum Viable Product |
| PESTLE | (P)olitical, (E)conomic, (S)ocial, (T)echnological, (L)egal, (E)nvironmental Analysis |
| SWOT | Strength-Weakness-Opportunities-Threats Analysis |

1. Introduction

1.1 Exposure of the problem

As a prevailing topic, digitalization is discussed in all areas of society. It encompasses economic, social and political elements and defines a change in society that effects everybody's business and private life. Digitalization as a "Megatrend"¹ influences all areas of life and all geographies. While the drivers of the digital transformation are new technologies², the impact is reaching beyond technology use. Digitalization inducing changes in society and economy that will completely change current economics³. For companies, digitalization has a major impact on several dimensions, starting with digitalization of existing processes, the enhancement of products, to the transformation of entire business models, and the change of existing value chains through digital networks and information exchange (European Commission, 2017).

The value creation with new technologies has become of major importance in in the last decade. Recent studies estimate that the digitalization of products and services can add more than 110 billion Euro of annual revenue in Europe in the next five years⁴. The speed and dynamic of technological innovation has increased. Not only large enterprises, but also small and medium-sized enterprises have to pick up the challenge. To actively pursue chances and react to new requirements, companies need resources, know-how and a digital strategy for navigating in the new environment. Nevertheless, studies show that companies, in particular smaller and medium sized companies, do not fully embrace the potential of digitalization (McKinsey, 2017). The drivers for digitalization in companies are both external and internal: the main external drivers are customer requirements and changes in the market; the main internal drivers are process optimization and cost optimization (Deloitte,

¹ <https://www.strategyand.pwc.com/global/home/what-we-think/digitization/megatrend>

² On a societal level, base technologies like network access technologies, semiconductor technologies, software engineering, internet of things and artificial intelligence (Katz & Koutroumpis, 2012)

³ <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

⁴ <https://ec.europa.eu/digital-single-market/en/policies/digitising-european-industry>

2013).

The examples for successful digital transformation are mostly discussed using large companies as example (Google, Apple) or start-ups that scaled using platform business models (Amazon, Facebook). While the first group has the power of market leadership and money, the second has the advantage of speed and flexibility. Small and medium enterprises (SMEs) are the backbone of the Austrian economy. They represent 48,9% of revenues and 43,6% gross value added in Austria⁵. An important output for the economy is generated by medium-sized enterprises with 50-249 employees: they generated 27% of revenues, 23% of gross value added, and 30% of investment volume in 2015. (Wirtschaftskammer Österreich, 2018). How can they use the chances of digitalization or leverage their existing business with digital technologies? SMEs face particular challenges regarding digitalization: they have to invest a higher percentage of their revenue for digitalization as opposed to larger companies (Kienbaum Consultants, 2017). The financial challenge is comparatively higher and often, they lack the financial resources. Furthermore, they have neither the know-how and competencies required, nor the technological resources (FHS St. Gallen, 2017; Institute for Digital Business der HWZ, 2017) that can be acquired more easily by large companies.

The Digital Business Report of 2017 (Kane, Palmer, Nguyen-Phillips, Kiron, & Buckley, 2017), a global survey with more than 3500 managers found a clear pattern among organizations: one of the most relevant factors differentiating digitally maturing companies (companies rating themselves to be in an advanced stage of digitalization) as opposed to early stage companies is a clear and coherent strategy. Furthermore, these companies take a longer view on digital strategy with time horizons of five or even more years. *“However, creating an effective strategy and linking it to overall business objectives remains one of the biggest challenges standing in the way of increasing a company’s digital maturity. When asked in an open-ended question what their organizations need to do differently in order to advance their digital maturity, nearly 40% of respondents say their company needs to improve digital strategy and innovation. Only 13% report that improving technology development and deployment is a source of concern. (Kane et al., 2017, pp. 7–8)”*. Digital strategies are not

⁵ The numbers are based on SMEs with 10-249 employees. Micro-enterprises with 1-9 employees, are not accounted for. Detailed statistics from the Austrian Chamber of Commerce see Appendix A.

limited to technological issues such as using mobile devices or migrating to the cloud. Instead, they chart how the organization can and should do business differently as digital technologies change the market.

1.2 Purpose of the thesis

Small and medium enterprises are the backbone of the European and Austrian economy. 15% of Austrian companies are SMEs with 10-249 employees⁶. They account for 44% of employees, and 48% of the revenues of the Austrian economy (Wirtschaftskammer Österreich, 2018, pp. 11–12). The status of digitalization, though, is lower in SMEs than in large companies. Large firms have a higher rate of adopting key technologies. In addition, SMEs often lack awareness of the positive outcomes for their businesses that could arise from setting up an integrated digital transformation strategy and investing in key technologies. Therefore, they are less likely to bear the short-term operational costs associated with such investments (European Commission, 2017, p. 11). To unlock the full potential of digitalization, governments in both Germany and Austria, have created programs specifically targeted at SMEs to help these companies cope with the challenges of digitalization (Germany: www.mittelstand-digital.de; Austria: www.kmu-digital.at). Both initiatives offer financial incentives for companies that actively approach digitalization strategy and projects. There is, however, no particular model nor research on how SMEs can achieve a coherent digitalization strategy.

„Strategy wins“ – this is the conclusion of many studies to the question on how to successfully master digitalization. A viable digitalization strategy is seen as the basis for all change processes following afterwards. Still, more than 50% of midsize companies („Mittelstand“), and even more SMEs do not have a digitalization strategy, and many of them see it as a big challenge in the transformation process. Ignorance of technological developments, skepticism towards current trends and the fear of replacing existing structures by new business models have an important impact on not addressing the challenges (Mittelstand Digital, 2016, p. 19).

⁶ Micro-Enterprises with 1-9 employees are generally counted for in SME statistics, but not the focus of this thesis. They account for 85% of all companies in Austria (in total, SME including micro-enterprises count for 99,6% of all enterprises in Austria, numbers given above are rounded).

The aim of this thesis is to provide a digital strategy framework that can be used by small and medium enterprises. The framework needs to be actionable – in a sense that it gives a clear guidance and defines appropriate results for companies, respectively consultants who work with companies. The main goal can be broken down in three objectives:

- 1) Objective 1: to develop a strategy framework that includes all relevant elements that SMEs should consider when setting up a digital strategy
- 2) Objective 2: to provide a process that is easy to follow and easy to understand for practical use
- 3) Objective 3: to identify what the results of the strategy process should include to enable SMEs to directly start with the implementation or transformation process

1.3 Research questions

The three main research questions are concerned with the development of a digital strategy framework: What are its elements, process and outcomes? Several sub-questions detail the main research questions:

Q1: What are the relevant elements of a digital strategy framework for SMEs?

- Can a general strategy framework be applied for all SMEs, regardless of industry sector?
- Which elements does the framework need to contain, which are optional?
- Is a business model change a part of strategy?
- What are relevant dimensions to be covered by a strategy framework?

Q2: What is a process for strategy development that is feasible?

- Which steps does the process include?
- What is an adequate duration and intensity of the process?
- Who is involved internally and externally (customers) and to what extent?
- What are the most relevant levers or mechanism to ensure a successful strategy?

Q3: What are the expected results of a digital strategy?

- Which artefacts need to be produced?
- Is a roadmap/action plan part of the results?
- What is the time-frame for the strategy?
- Is a “picture” of the IT- landscape part of a digital strategy?

1.4 Method

The thesis uses a multi-step approach applying qualitative research methods to come to a definition of a new framework. A heuristic and qualitative method is used, using interviews with eight experts in Austria to evaluate the insights from the literature and survey review. Based on semi-structured interviews, the findings are coded and applied to adapt the framework.

The literature review contains both academic and professional sources that are related to digitalization, digital transformation and related concepts. Existing digital strategy frameworks are analyzed and evaluated to find the relevant input factors for a new strategy framework geared towards SMEs. As a result of the literature review, the relevant structural categories and elements for a framework are identified for further exploration. In a second step, surveys from the DACH region are interpreted to identify the most relevant issues for SMEs regarding digitalization. In particular, the chances, risks and focus areas are evaluated as an input for a digital strategy framework. The resulting categories are used for structuring the questions for the expert interviews.

In semi-structured interviews, experts with both academic and professional background in digitalization of SMEs are asked for their view on the process, elements and dimensions to be used in a framework. In the content analysis according to Mayring (Mayring, 2015), the answers are coded partly along the previously defined process, elements and dimensions, with a focus on gathering additional insights to the research questions that are not captured by the existing frameworks.

The findings of the interviews are merged with the results from the first step, the framework analysis, to suggest a new digital strategy framework targeted at SMEs. In a final step, the framework is evaluated by presenting it to SMEs regarding comprehensibility, process, and applicability. The results of these interviews lead to a critical review of the framework.

1.5 Structure of the thesis

Chapter 1 summarizes the current status and relevance of digitalization for SMEs and lays out the research questions: How can SMEs develop a suitable strategy that will result in actions.

Chapter 2 summarizes the current discussion and concepts on digitalization and related terms.

Chapter 3 looks at the current status of digitalization of SMEs, comparing the results of several recent studies of the DACH region regarding levels and focus of digitalization as input for the framework focus.

Chapter 4 gives an in-depth evaluation of a range of digital strategy frameworks. It analyses the frameworks in regard to the process they suggest, the elements they contain, and the dimensions they use. Furthermore, the usefulness for SMEs is described. The evaluation is the basis for the expert interviews.

Chapter 5 gives details on the expert interviews: the choice of experts, the interview questions, the coding principles and the results of the interviews. The findings from the expert interviews in regard to the research questions are systematically evaluated.

Chapter 6 develops the framework for digital strategy. The framework depicts relevant areas of digitalization as well as the process to get to a coherent strategy and action plan. A visual representation of the process is the core of the framework.

Chapter 7 contains an evaluation of the framework as a result of interviews with stakeholders of selected SMEs. Questions regarding the scope, the timeline, the resources and the relevance of the elements of the model are asked and findings used to adapt parts of the framework.

Chapter 8 summarizes the findings, evaluates the practical use of the framework and identifies for further research areas.

2. Digitalization: Definition of Terms

2.1 Digitization, Digitalization and Digital Transformation

A recent survey among large German companies showed that more than 55% see the digitization of the existing business model or existing processes as digital transformation. 28% see the development of new digital business models as relevant for digital transformation. 12% define the optimization and streamlining of the IT systems as digital transformation (etVenture & GfK 2018). Austrian and Swiss surveys among SMEs show a similar picture: there is no consistent definition of the term digitalization (LIMAK, 2017; Peter, Marc K., 2017).

Brian Solis from the Altimeter Group defined digitalization as *“the realignment of, or new investment in, technology, business models, and processes to more effectively compete in an ever-changing digital economy”* (Solis, n.d.) In this definition, effective competition through technology lies at the core of the definition.

Gartner Group’s definition has a stronger focus on value creation and revenue; furthermore, it defines digitalization as a process, albeit with a self-reference in the goal: *“Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.”* (Gartner, n.d.)

Unruh & Kiron (2017) try to give a definition of the terms by aligning “digitization”, “digitalization” and “digital transformation” along three different stages in a development process ranging from a single product/process level, to enterprise level and finally to a societal level.

- Digitization: initial conversion of products, processes or services into a digital format
- Digitalization: the development of new business models and business processes that can take advantage of the newly digitized products. According to them, *“Digitalization is usually disruptive for incumbents because it renders their existing business models and processes obsolete.”* (Unruh & Kiron, David, 2017)
- Digital transformation occurs when new digital business models and processes restructure economies. Societies also evolve as people integrate the technologies into

their lives and habits. *“Digital transformation is a systems-level transition that alters behaviors on a large scale.”* (ibido)

Peter (Peter, Marc K., 2017, p. 9) uses a similar definition, distinguishing only between the terms digitalization and digital transformation⁷: digital transformation is seen as a change encompassing the whole society, and not individual companies: *“Digitalization defines a technical process, at which analogue data or processes are transformed into digital ones. The digital transformation is a change that concerns both the economy and society as a whole. Therefore, digital transformation needs to be seen as a holistic und comprehensive change process.”*

While the attempt to define a different scope for digitalization and digital transformation helps for a theoretical understanding, the current practice shows a different picture: digital transformation is often used interchangeably with digitalization in connection with business model change on an enterprise level as well as with an overall mega-trend on a societal level.

| | |
|---|--|
| BMWi (2015) in (Schallmo, Williams, & Boardman, 2017) | Digitization stands for the complete networking of all sectors of the economy and society, as well as the ability to collect relevant information, and to analyze and translate that information into actions. The changes bring advantages and opportunities, but they create completely new challenges. |
| Bowersox et al. (2005) in (Schallmo et al., 2017) | Digital Business Transformation (DBT) is a “process of reinventing a business to digitize operations and formulate extended supply chain relationships. The DBT leadership challenge is about reenergizing businesses that may already be successful to capture the full potential of information technology across the total supply chain”. |
| Mazzone (2014) in (Schallmo et al., 2017) | “DT is the deliberate and ongoing digital evolution of a company, business model, idea process, or methodology, both strategically and tactically.” |
| PwC (2013) in (Schallmo et al., 2017) | DT describes the fundamental transformation of the entire business world through the establishment of new technologies based on the internet with a fundamental impact on society as a whole. |
| Bouée and Schaible (2015) in (Schallmo et al., 2017) | We understand DT as a consistent networking of all sectors of the economy and adjustment of the players to the new realities of the digital economy. Decisions in networked systems include data exchange and analysis, calculation and evaluation of options, as well as initiation of actions and the introduction of consequences. |
| (Adlmaier-Herbst and Schildhauer, 2017) | A DT is the purposeful use of digital technologies to recreate the value chain and tap into the enormous potential of future markets. |
| (Büst, Hille, & Schestakow, 2015) | DT describes the fundamental change of companies towards a completely networked digital organization. Based on new technologies and applications, always more processes and process elements are transformed to comply with the requirements (real-time, networking) of the digital economy. |

⁷ In German, there is no translation for the terms “digitization” and “digitalization”. The German word “Digitalisierung” refers to both English words, making a distinction between the two terms impossible.

| | |
|-----------------------------|--|
| (Ruoss, 2015) | DT uses information- and communication technologies to enhance the performance of companies and organisations. DT is about the transformation and development of company processes, the customer experience, and the business model. |
| (Schallmo & Rusnjak, 2017) | DT means to use technological potential to change or to interconnect business models and value chains with the goal to satisfy increasing customer requirements and create services more efficiently. |
| (Schallmo & Williams, 2018) | DT is as a sustainable, company-level transformation via revised or newly created business operations and business models achieved through value-added digitization initiatives, ultimately resulting in improved profitability. |

Table 1: Digital transformation definitions, adapted from (Schallmo et al., 2017)

Ismail et al. have summarized the various levels of digital transformation perspectives (Ismail, Khater, & Zaki, 2017): The company and network level are of relevance for this thesis.

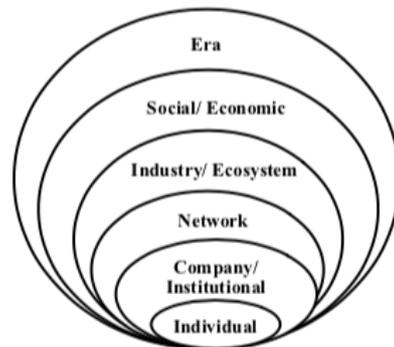


Figure 1: Digital transformation perspectives in the literature (Ismail et al., 2017, p. 2)

For “digital transformation”, the thesis uses the definition of (Schallmo & Williams, 2018, p. 4) who define it “as a sustainable, company-level transformation via revised or newly created business operations and business models achieved through value-added digitization initiatives, ultimately resulting in improved profitability.” This definition offers various relevant aspects: first, it implies that the change is sustainable, which is of high importance for SMEs; second, it offers both a revision (incremental change) and a new creation of business models (business model transformation), thus including both small digitalization projects as well as a complete business model overhaul; third, it also includes business operations, thus encompassing the processes, organization and structures that are of the starting point for digitalization initiatives; fourth, the definition implies changes over time in various initiatives; and finally, it has a the clear goal of profitability.

Digitalization, on a company level, is the use of digital technology for the improvement of

customer relations, processes, or revenue streams, or to create new business opportunities. Digitalization efforts can be applied within the existing business model. Nevertheless, the distinction between digitalization and digital transformation is remains subjective: adding digital customer channels qualify for both digitalization and digital transformation; setting up a digital platform, on the other hand, is definitely a digital transformation if a company was not in the platform business before.

2.2 Industry 4.0

Industry 4.0, a term used extensively in regard to industrial companies and especially the “Mittelstand” (medium-sized, mostly family-owned companies) in Germany, is generally regarded as changing only one part of the business model, namely the production and process side, by using automation, sensors, robotics and networks to generate and use data for enhancing the existing business. Therefore, “Industry 4.0” is often considered to be digitalization than digital transformation of a company. Kreutzer (2017) sees one of the core-features of Industry 4.0 as the integrated value chain. *“At the core of industry 4.0 is the informatization of the production technology. The goal is a “smart factory” that can adapt rapidly to changing environments and requirements. On the other hand, increase of efficiency and effectivity are through the integration of the information chain of suppliers and customers”* (Kreutzer, 2017, p. 50).

Often, though, industry 4.0 also creates new services that could not have been invented without the digitization of the production process beforehand. The change from digitalization to digital transformation is a fluent one. Industry 4.0, therefore, can be seen as a part of digitalization or digital transformation with a focus on enhancing production and processes by connecting physical and technological systems.

2.3 Business Model

In the context of digitalization or digital transformation, the concept of the business model plays a crucial role. There is still no uniform definition of the term “business model” in the academic literature. Often, a business model is described as the logic behind the way companies function. In a broad sense, a business model is a plan for the successful operation of a business. It is a construct of several elements, with the goal to show the value proposition for defined customer groups: how the value is delivered, what is necessary to

create the value, and which revenue streams and what costs are involved. Business models are generally descriptive, which is also expressed in the definition of Amit and Zott: *"A business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities"* (Amit & Zott, 2001).

In the context of digitalization, two business model descriptions are most often referred to when practitioners or scholars talk about business models: the "business model canvas" (Osterwalder, Pigneur, & Clark, 2010) and the "business model navigator" of St. Gallen (Gassmann, 2016; Gassmann, Frankenberger, & Csik, 2017). The Business Model Canvas, developed by Osterwalder and Pigneur is the most comprehensive template used for developing and referencing business models. Their nine-part "business model canvas" is essentially an organized way to lay out assumptions about key resources and key activities of the value chain, the value proposition, customer relationships, channels, customer segments, cost structures, and revenue streams. The St. Gallen Business Model Navigator (Gassmann, 2016; Gassmann et al., 2017) is the second description and a tool that is most frequently used and cited in the context of digitalization and business model adaption: The model depicts four main elements that need to be analyzed for a business model: the target customer, the value proposition towards the customer, the value chain behind the creation of this value, and the revenue model that captures the value. The business model architecture of a company describes how these four elements are interrelated with each other. Gassmann et al. claim that when at least two of the four dimensions are changed, one can talk about a business model innovation. Based on their business model definition and the analysis of 250 firms, they have developed 55 distinct business models, some of which are essentially related to digitalization.

The digitalization or digital transformation of a business model, in this sense refers to changing aspects of a business model as result of digital technologies. Werani et. al discuss the digitalization options of business models using 11 business model dimensions that they cross reference to three value drivers: customer benefits, price and costs of value creation. They suggest digitalization options for every dimension except for customer segmentation (Werani, Schauburger, Martinek-Kuchinka, & Freiseisen, 2017). Becker (Becker, Ulrich, Botzkowski, & Eurich, 2017, p. 288) stresses that the digitalization of business models can be applied to three levels:

- 1) By changing parts of a business model, such as customer channels or partner or product value proposition
- 2) By changing the complete business model in terms of value creation and revenue streams, such as using a platform business model
- 3) By creating new, parallel business models or aligning options along time horizons

Often, a partial or total transformation of a business model due to digitalization is an ongoing process involving gradual changes at the beginning. There is no clear line between a change or a total transformation. As a mode of transformation, an existing business model is sometimes paralleled with a new business model.

2.4 Digital Disruption

Introducing new business model to the “margins” of existing markets is the definition of a disruptive innovation. Since Clayton Christensen coined the term of disruptive innovation(Christensen, 2013), it has been brought in connection with digital. Mainly, it addresses the mechanisms of incumbents to be thrown out of business by fast-growing, agile startups that focus on a market niche or a market that has yet to be developed. In connection with digital technologies, disruption is used in a context of companies that are not fully or only incrementally digitized as opposed to those building their business model on digitalization and thus gaining a higher benefit from digital principles. Christensen, especially in his later work and his Jobs-to-be-done theory (Christensen, 2016) begins by focusing on the customer value proposition. Digital disruption, in this sense, is the provisioning of a new value proposition based on the opportunities that can be addressed with digital technologies. This is a promise to SMEs: the threat of being disrupted is considered to be lower, due to the closer relation they have with customers. Furthermore, SMEs were traditionally faster in reacting to the market and adapting to market needs, either locally or internationally in niche markets.

Nevertheless, the costs of digitalization are considerably higher for SMEs, enhancing the risk of being disrupted from players that use economies of scale and the low marginal costs of platforms. It was small retail businesses that were put out of market first by Amazon’s international presence, excellent service and rapid logistics. Digital disruption is not only threatening incumbents, but also SMEs. The three different types of disruption (low-end, new market and high end disruptions) all require risk-taking, resource investment, and a

niche-market strategy without immediate revenue creation (Matzler, 2016, pp. 84–86). The risks to be disrupted rather than to be a disruptor are rather high for SMEs.

2.5 Digital Strategy

Companies that digitalize or set digital initiatives realize that in order to explore new digital technologies and exploit their benefit, they need to make choices, find a direction, establish management practices govern the transformations and changes that go along with the implementation. Digitalization is a multi-dimensional approach that not only involves the IT department, but changes business operations, affects products and processes, and often requires organizational or cultural changes. An important approach is to formulate a digital strategy or digital transformation strategy that *“serves as a central concept to integrate the entire coordination, prioritization, and implementation of digital transformations within a firm. (Matt, Hess, & Benlian, 2015, p. 1) ”*. While this definition also includes the implementation, strategy formulation is generally does not involve the execution itself. Therefore, a definition deriving from the classic strategy approach narrows digital strategy better down: *“Strategy is setting a direction, sequencing resources and making commitments”* (McDonald, 2015). In his article, McDonald goes on to argue that direction is about the “why” in terms of ambition the exclusion of alternatives, about the sequence in terms of “when” and “what first” and about resources and commitment in terms of “what” and “who”. Similarly, Wade argues that a strategy framework is about the why, the how and the who of transformation (Wade, Michael, 2015).

In summary, a digital strategy defines the goal, ambition and direction of a company with regard to the major changes induced by digital technologies, in combination with defining the relevant measures, resources and priorities to achieve these goals.

2.5.1 Relation to business strategy

While in the last decades, IT-strategy has been clearly subordinated to business strategy, the importance of digital technologies has changed its relevance for the strategy process. Therefore, digital strategy has evolved to have almost the same relevance as corporate strategy, or, being an inherent part of the corporate strategy (see Yeow ((Yeow, Soh, & Hansen, 2018) for a discussion on IT to business strategy). Coupling the digital infrastructure with the corporate strategy gives the ability to rapidly adapt to the dynamic requirements of

the digital marketplace. The article “Digital Business Strategy: Toward a Next Generation of Insights” goes even further and states that a “digital business strategy” should not be considered below the corporate strategy but treated as the corporate strategy itself for the digital era (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). The authors envision that the “digital business strategy” will be the corporate strategy. Ismail et al. define digital business strategy as “*company-spanning strategy that is formulated to enable a company to incorporate the opportunities of the digital economy by leveraging digital resources and capabilities, and transforming along multiple business dimensions: operational, customer-focused and business-models*” (Ismail et al., 2017, p. 16). They position digital transformation strategy on the same level as business strategy.

The importance of digitalization, coupled with the newness and speed of transformations requires additional attention and resources to be put into a separate, supporting digitalization strategy. Currently, business strategy has too little focus on technology-driven changes in markets (as a threat or opportunity), and too little focus a the - sometimes radical - changes these technologies apply to internal structures and processes.

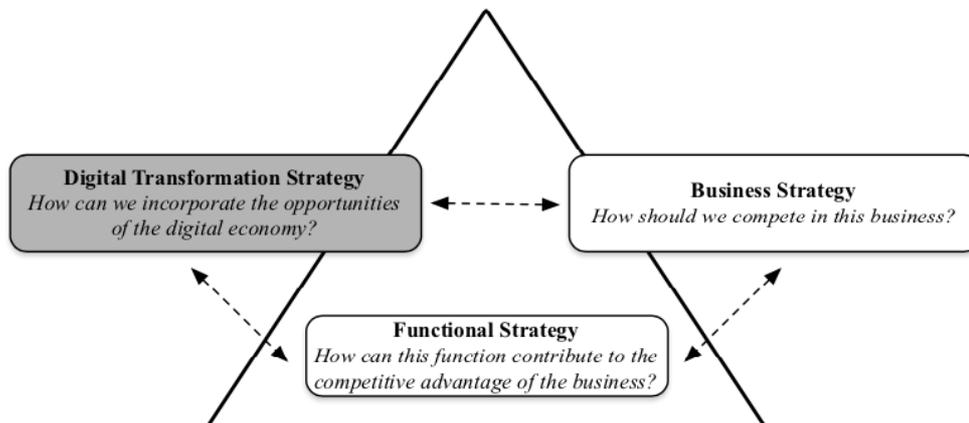


Figure 2: Digital transformation strategy in relation to business strategy (Ismail et al., 2017, p. 11)

In his report for the Global Center for Digital Business Transformation, Michael Wade describes the dynamics inherent in digital business strategy when he states that “*Transformation is fundamentally about change, and organizational change is the foundation of digital business transformation. (...) A business transformation is digital when it is built on a foundation of digital technology* (Wade, Michael, 2015, pp. 4–5)”. The

organizational change is related to people, processes, strategies, structures and competitive dynamics; therefore, Wade argues, investments in digital technologies have to be combined with organizational change.

2.5.2 Digitalization Strategy vs IT strategy

While there are various concepts of IT strategies (Teubner 2013), they mostly define the current and the future operational activities, the application systems and infrastructures, and the adequate organizational and financial framework to fulfill business operations within a company. Hence, IT strategies usually focus on the management of IT within a firm, with only a narrow impact on driving innovations in business development. This constricts the product-centric and customer-centric opportunities that arise from new digital technologies, which often cross firms' borders. *"IT strategies present system-centric roadmaps on the future uses of technologies in a firm, but they do not account for the transformation of products, processes, and structural aspects that go along with the integration of technologies"* (Matt et al., 2015, p. 3). IT strategy is mainly concerned with the process of selecting appropriate technologies where to invest in, following the path of a defined business strategy.

Digital strategy, coming from a business-centric perspective, focuses on the transformation of products, processes, and organizational aspects owing to new technologies. Its scope is more broadly designed and explicitly includes digital activities at the interface with or fully on the side of customers, such as digital technologies as part of end-user products. Digital transformation strategies go beyond the process paradigm. They include changes to, and implications for products, services, and business models as a whole (Matt et al., 2015, pp. 3–4). IT strategy, in this sense, follows digitalization strategy as much as it follows business strategy. In many companies, though, IT is the driver of digitalization strategy. In particular with regard to the optimization of processes, or with the monitoring of new technological trends, IT plays a crucial, but not sufficient role in digitalization strategy.

2.6 Summary

In this chapter, the relevant terms, definitions and concepts related to digitalization were explored, to rely on a common understanding for a framework definition. The literature review showed that the terms "digitization", "digitalization" and "digital transformation" are

used more or less interchangeably. Digital transformation is used for both incremental changes (such as adding digital services to existing products) as well as business model changes (such as creating a platform model). The word “transformation” implies change, and most commonly this indicates that the digitalization is having implications in various dimensions of a company.

This thesis uses the term “digitalization” for the further framework development: the term is closer to the reality of digitalization of SMEs, where mostly only parts of a business are digitally changed (or replaced), without necessarily changing the business model.

A digital transformation strategy or digital strategy defines the implementation of opportunities of the digital economy on a business level, encompassing multiple dimensions and implying organizational changes. Industry 4.0 is a part of digitalization with a focus on process enhancement.

3. Digitalization and SMEs

What is the current status of digitalization in SMEs? Current surveys from the DACH-region, with a focus on SMEs, will give an overview of the actual status and challenges for SMEs regarding digitalization or digital transformation.

For the purpose of this thesis, the definition of SMEs of the European Commission is used as a base. Small and Medium Enterprises (SMEs) are defined through three criteria: The number of employees (10-250), annual turnover (less than 50 million) and/or an annual balance sheet total not exceeding 43 million (Commission of the European Communities, 2013). Micro enterprises (with less than 10 employees and an annual turnover of less than one million) were not considered as the focus of the thesis, since their organizational structure is different, and strategy is mostly not a focus. In Germany, the definition of an SME is often used differently: the Cologne “Institut für Mittelstandsforschung” (“IfM Bonn: KMU-Definition des IfM Bonn,” n.d.) widens the criteria for SMEs to include companies with less than 500 employees (with a maximum turnover of 50 million). Survey results for these companies are included. The surveys conducted by various institutions do not follow the same definitions – therefore, a clear line between SMEs in larger or micro enterprises cannot be drawn in all results.

3.1 Current status of Digitalization

In the last years, various surveys in the DACH region have analyzed the status of digitalization. Some of the with a focus on SMEs (Arthur D. Little, 2017; FHS St. Gallen, 2017; Institute for Digital Business der HWZ, 2017; Peter, Marc K., 2017), others with a focus on the German “Mittelstand” (Büst et al., 2015; Kienbaum Consultants, 2017; Leyh & Bley, 2016; McKinsey, 2017; Saam, Viète, & Schiel, 2016), and some with companies of various sizes (Ernst & Young, 2018; etVenture + GfK, 2018; Horváth & Partners, 2018; Kienbaum Consultants, 2017; LIMAK, 2017).

Initiatives in Germany, Austria and Switzerland attempt to enable the SMEs to be part of the digital transformation. Nevertheless, studies in all three countries show that the level of digitalization is higher with the size of the company. In Austria, digital technologies are far more important for business models of large companies than for those of small companies.

Only 16% of companies with less than 30 million Euro revenue state that digital technologies currently play a role for the business model (Ernst & Young, 2018, p. 6). In a recent Swiss study, the assessment of relevancy of digital transformation was also significantly higher in large companies (almost 92%) than in SMEs (73%) (Peter, Marc K., 2017, p. 33). Similar results are reported from the digital maturity transformation report of another Swiss survey: larger companies have the highest digitalization grade, while smaller companies fall behind (Institut f. Wirtschaftsinformatik, 2017, p. 6). In Germany, meta-analysis of research regarding digitalization of the German „Mittelstand“ (Mittelstand Digital, 2017) has shown that even though half of the companies said that the topic of digitalization is highly relevant, the majority of the companies consider themselves to be in the middle field of digitalization. Even though they are aware of the necessity of digitalization, the relevant steps are not taken. The study concludes that small companies (and companies of the construction industry) do not see the relevancy of digitalization for their business model, and therefore do not take active steps in digitalization. An earlier study among German medium-sized companies (Saam et al., 2016) found that most companies increase digitalization, but in small incremental steps – with 40% of them spending less than 10.000 Euro/year for digitalization projects. Similarly, a survey among SMEs in Germany shows that most companies have the awareness of the importance of the topic, with the implementation of actual steps lagging behind. Most companies see the potential of cost-reduction through increased efficiency of processes. (Leyh & Bley, 2016)

A Kienbaum study did evaluate the actual amount of financial resources needed: Smaller companies have to invest more in digitalization than large companies: with a revenue of less than 10 Million Euro, they invest in average 4,82% of revenue in digitalization, the percentage dropping to 1,07% with companies that have a revenue of over 500 Million Euro. The amount of investment is also related to the industry, with ICT and electronic-industry leading the investments. The Swiss “SME Monitor” of the FHS St. Gallen comes to a conclusion that reflects that situation: *“The largest challenges of digitalization are not on the technical area. SMEs often lack the financial resources to provide the high investments needed”* (FHS St. Gallen, 2017, p. 5).

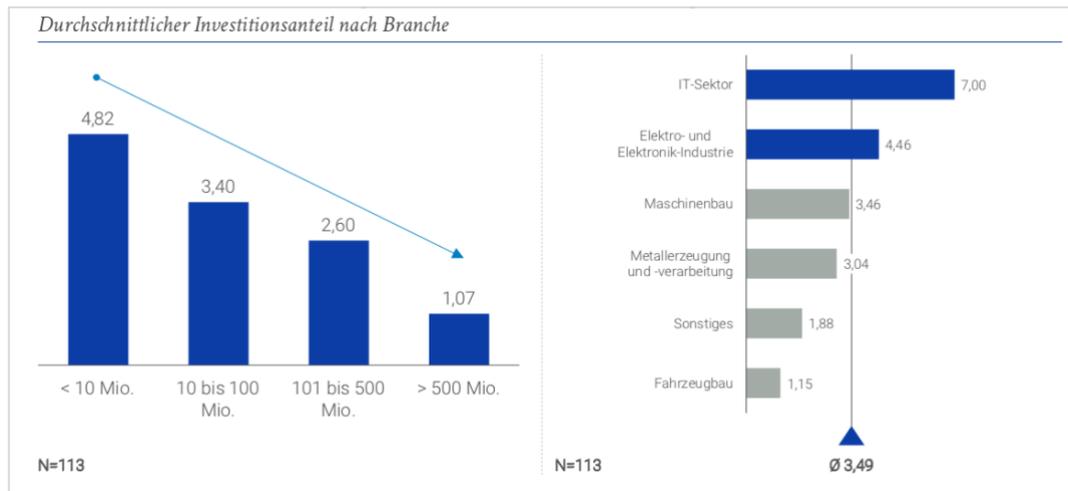


Figure 3: Average % of investment in digitalization according to company size and industry
(Kienbaum Consultants, 2017, p. 25)

3.2 Industry-specific challenges and chances of digitalization

The challenges of digitalization are different for every industry. The amount and speed of change vary from every industry (FHS St. Gallen, 2017, pp. 20–26). For the production industry, the main challenges are the competency and know-how of employees, followed by data security and high investments. The increase of efficiency of processes is the highest chance companies see in this industry. The main challenge for the construction industry is the high investment; the main chances are automation of processes and the development of new business models. The ICT industry perceives the entry of new competitors such as start-ups and data security issues as a great challenge. It sees chances in the development and implementation of new business concepts (such as Software as a Service) and the attraction of new customers. The service industry sees, similar to the production industry, the higher efficiency of processes as chance, and perceives data security, lack of know-how and lack of technical prerequisites as the greatest challenges. For retail and gastronomy, market transparency and intensity of competition are major challenges, while other market-related aspects such as using new sales channels and gaining new customer outside existing geographical boundaries are seen as chances. The health industry names both data security and high investments as challenges, but also recognizes the use of customer data for the personalization of services, in combination with process automation, as main chance. In total, SMEs perceive digitalization as chance and a threat, with the ICT-industry seeing the most chances, whereas chances and challenges are in a balance for the retail industry.

3.3 Main challenges regarding digitalization

The top challenges regarding digitalization according to an Austrian survey among SMEs where the missing know-how for implementation (36%), the missing goals (32%) and the lack of information (31%). Challenges mentioned by more than 25% of the respondents were a lack of financial resources, regulatory issues and hurdles and no plan for implementation (Arthur D. Little, 2017, p. 21). Interestingly enough, two of the points mentioned could be remedied by a well-designed strategy process (goals and implementation plan). A recent survey among Austrian companies by Ernst & Young found only few factors that were hindering further investments in digitalization – and those had gone down in relation to the previous year: lack of people (9%), limited financial options (8%), and lack of know-how (5%). The top challenges, according to the study, are cybersecurity (75%), higher requirements regarding competencies (85%), and the changes in the market environment (69%) (Ernst & Young, 2018, p. 10). A recent Swiss study by the College of St. Gallen shows a similar picture: data security was the number one challenge faced by SMEs (45% of mentions). Similar to the Austrian survey, 40% see high investments as necessary (and a challenge with the lack of financial resources), in direct relation to missing technological prerequisites (partly caused by high data security standards). The third challenge with 36% is the lack of know-how of employees. (FHS St. Gallen, 2017, p. 23) The study concludes that one of the results of investments in high-tech solutions are higher capital costs, since digitalization increases the fixed costs, thus intensifying the competition within the industry. The following table shows a summary of the top 5 challenges of digital transformation according to the surveys.

| Survey | Top 5 challenges/barriers to DT |
|---|--|
| Digital transformation of SMEs in Austria (Arthur D. Little, 2017) 1700 SMEs, 81% Micro-enterprises | 36% lack of know-how for implementation 32% lack of goals, or hard to define goals 31% not enough information 27% lack of financial resources 24% legal constraints |
| Digital change in Austrian mid-sized companies (Ernst & Young, 2018) 900 companies, 61% medium-sized (revenue <30 mio.) | 75% importance of cybersecurity 88% higher requirements regarding competencies 69% changes of market/new competitors 68% development of new sales channels 64% change in company culture |
| SME-Transformation (Switzerland) (Peter, Marc K., 2017) 1854 companies, 62% SMEs | 46% lack of time 42% know-how of management 39% know-how of employees 33% costs 28% data security |
| SME Monitor 2017. Digitalization in Swiss SMEs. | 44% data security |

| | |
|--|---|
| (FHS St. Gallen, 2017) 603 companies, 52% micro, 30% small, 16% micro-enterprises | 40% high investments necessary 36% lack of know-how of employees 29% increase of price-fights due to more transparency 28% lack of technical prerequisites |
| Digital Switzerland 2017 (Institute for Digital Business der HWZ, 2017) 1294 companies | lack of financial resources lack of know-how of employees lack of technological assets legal insecurities lack of change-culture |

Table 2: Top challenges of digital transformation, survey overview

3.4 Drivers of digitalization

Future chances through digital transformation are expected in the following top three areas: acquisition of new customers (66%), cost savings (52%) and an increase in flexibility and agility (46%) (Arthur D. Little, 2017, p. 23). Similar, the Ernst & Young survey (Ernst & Young, 2018, pp. 6–7) has evaluated customer relationships as the most relevant field for digitalization (76%), followed by the technical usage of mobile devices (62%) and online commerce & payment (49%). This result is backed up by the Swiss SME Monitor: Efficiency gains through the automation of processes, the development of new products and gaining new customers are the most important drivers of digitalization (FHS St. Gallen, 2017, p. 5).

| Survey | Top 5 drivers of digital transformation |
|---|---|
| Digital transformation of SMEs in Austria (Arthur D. Little, 2017) 1700 SMEs, 81% Micro-enterprises | 66% acquisition of new customers 52% cost savings 46% higher agility and flexibility 43% enhancement of customer loyalty 41% new income sources |
| Digital change in Austrian mid-sized companies (Ernst & Young, 2018) 900 companies, 61% medium-sized (revenue <30 mio.) | 76% customer relations 62% technical usage of mobile devices 49% online commerce and payment 35% automation of production (industry 4.0) 35% integrated value chain with partners |
| SME-Transformation (Switzerland) (Peter, Marc K., 2017) 1854 companies, 62% SMEs | 82% more efficient processes 59% customer requirements 53% technology 49% cost savings 42% increased transparency |
| SME Monitor 2017. Digitalization in Swiss SMEs. (FHS St. Gallen, 2017) 603 companies, 52% micro, 30% small, 16% micro-enterprises | 55% increased efficiency through automation of processes 43% development of new business models 42% new customers in new geographical areas 31% increased customer retention |
| Digital Switzerland 2017 (Institute for Digital Business der HWZ, 2017) 1294 companies | increase of customer retention increase of customer acquisition better customer experience cost reduction increase of revenue through new products&services |

Table 3: Top drivers of digital transformation, survey overview

3.5 Strategic approach and maturity

The „Digital maturity and transformation report“ (Institut f. Wirtschaftsinformatik, 2017) asked Swiss, Austrian and German companies how they do approach digital transformation. It defined five different approaches: top-down driven, bottom-up (driven through employee-initiatives), IT-focused, channel-focused (driven by customer expectations), and innovation-driven (focus on new technology and business models).

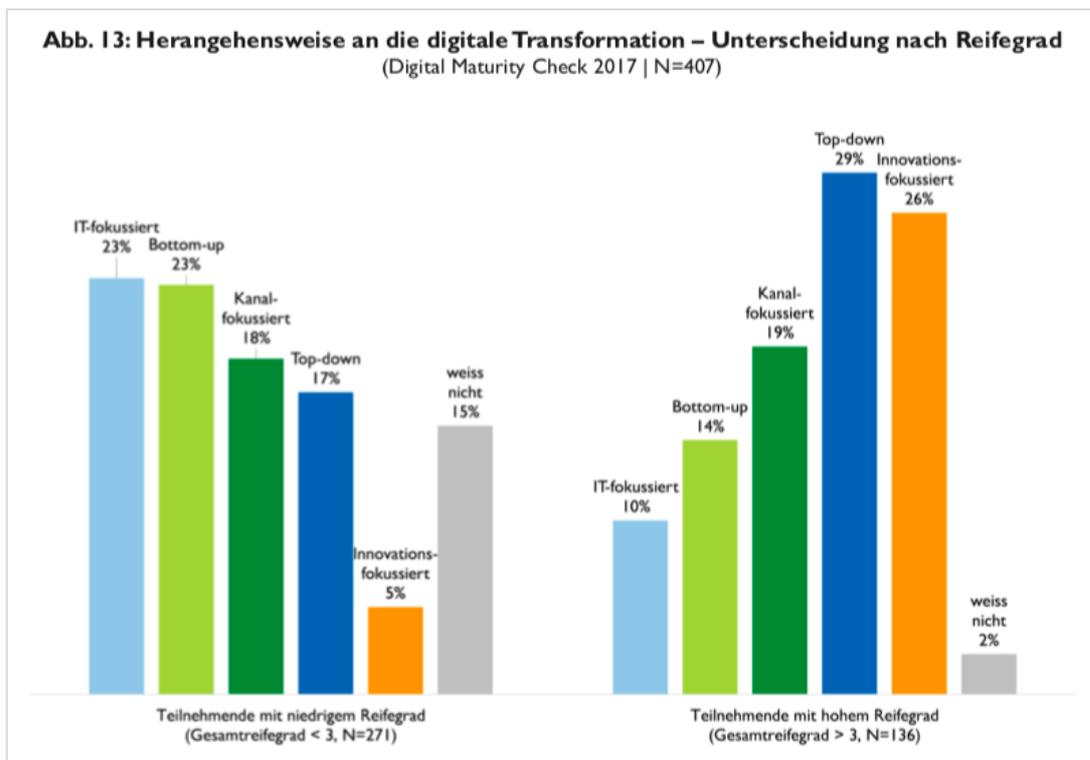


Figure 4: Digital transformation approach and maturity (Institut f. Wirtschaftsinformatik, 2017, p. 22)

Companies with a high digital maturity index use more often a top-down (29%) or innovation-focused (26%) approach to digital transformation than companies with a low maturity index. These are higher IT-focused (23%) or use a bottom approach (23%) for digitalization. The survey seems to be a case in point for implementing a company-wide, top-down digital transformation approach as well as an innovation-driven approach. A digital strategy that encompasses all areas of a company would support that approach. There is no further information about a relation of different company sizes and digitalization approaches. Looking at the digital maturity index of the same survey, SMEs do have a very

similar ranking as large companies, whereas micro-enterprises lag behind.⁸ The dimension with the highest grade of digitalization was “strategy” with 54%. This was also the one with the highest differences between large and small companies (67% vs. 64%) (Institut f. Wirtschaftsinformatik, 2017, p. 27).

3.6 Summary and Insights

The awareness of digitalization as a relevant business trend is high. This does not necessarily imply action: there is a difference between awareness and implementation. A uniform result of the surveys is a higher grade of digitalization in larger companies: the larger the company, the more importance is given to digitalization initiatives, in particular in regard to a re-evaluation of the existing business model. The smaller the company is, the less likely it is to see the implications of digitalization on its own business model, the less likely it is to have a strategy, and the less likely it is to act. Both the degree of digitalization and the focus of digitalization initiatives vary highly according to industry.

Regardless of industry, the main challenges regarding digitalization for SMEs can be summarized in three areas:

- 1) lack of know-how on both the executive and the employee level;
- 2) financial constraints regarding investments in new technology, often in relation with security issues;
- 3) lack of time for digitalization initiatives.

Furthermore, companies that are not more advanced in their digitalization, approach digital transformation rather top-down and innovation driven than bottom-up and IT-focused. This result seems to confirm two relevant aspects of digitalization: first, it needs to be driven from the management, and second, a business-centered, strategic approach results in more successful outcomes.

⁸ The results have to be interpreted with caution, since the determination of the index derives from predefined categories that might reflect the structure and possibilities of larger companies.

4. Digital Strategy Frameworks

Digitalization, regardless of the exact definition and scope (see chapter 2), is an important part for the future success of companies. The previous chapter has shown that SMEs have started with digitalization, but rarely embraced the full potential of it. Single initiatives are concentrated around specific areas, mostly related to better customer relations and process efficiency. The strategic anchoring of digitalization is a path many SMEs have not yet taken. This chapter explores and compares existing digital strategy frameworks. The goal is to extract the most relevant elements, with a particular evaluation of the usefulness for SMEs.

4.1 Overview

Digital strategy frameworks reflect the importance of digitalization on a strategic level. A framework contains a structure or system for the realization of a defined result/goal. For digitalization, the goal of the framework is to arrive at a coherent digital strategy. Digital strategy frameworks give guidance for companies that start (or already deal with) digitalization, without a detailed definition of the techniques used within. Frameworks help in two ways: first, they depict the relevant elements that are part of a strategy; second, they define a process to be followed to get to relevant results. Frameworks give reference points to both content and structure of the strategy process.

Both scope and suggested results of digital strategy frameworks vary in the literature.

Mostly, these frameworks have been introduced by consulting companies like Accenture⁹, CapGemini (CapGemini Consulting, 2011) McKinsey (Dawson, Hirt, & Scanlan, n.d.), Boston Consulting Group (Boston Consulting Group, n.d.), Altimeter/Cognizant (Solis, n.d.), Bain&Company (Bain & Company, n.d.; Lancry, Morrissey, Shannon, Bankert, & Cummings, 2017) and Roland Berger (Roland Berger & BDI, 2015). The frameworks are used as reference points for a comparison of elements and dimensions of strategy frameworks.

For the detailed evaluation of digital strategy frameworks, this thesis uses four models that include both a description of the process as well as the elements (or building blocks) of such

⁹ Accenture's framework is not available any more on the company website, but only on a slideshare-presentation: <https://www.slideshare.net/AccentureNL/accenture-digital-business>

a process.¹⁰ The models were selected with three main criteria in mind: 1) the completeness in terms of process/element description; 2) the variety of angles they provide (by setting the focus differently); and 3) by the relevancy for small and medium enterprises.

Framework A (Berlin Management Model for Digitalization) was developed by scholars who are also actively involved in digital strategy consulting. It is particularly focused on SMEs. Frameworks B was also developed by scholars with extensive industry-know-how and active consulting. It is not focused on SMEs in particular. Framework C was developed by a German consultant agency in cooperation with a business school; it is part of an extensive set of practice tools of that agency. Framework D was developed as a result of a research project including a survey conducted with about 1800 Swiss companies (mainly SMEs) by a school of economics. It includes a digital maturity assessment.

| | | |
|---|---|--|
| A | Berlin Management Model for Digitalization (BMM™) (Adlmaier-Herbst & Schildhauer, 2017) | The description of the framework with a focus on SMEs was published in a Swiss SME magazine |
| B | Roadmap to the digital transformation of business models (Schallmo & Rusnjak, 2017; Schallmo & Williams, 2018) | The focus of this framework is on business model innovation. |
| C | Digital transformation strategy roadmap (Esser, 2014) | The framework is derived from practical consultancy work including medium sized companies. |
| C | Procedure model for digital transformation (Peter, Marc K., 2017) | The framework was developed as a result of a research project including an in-depth survey among companies (mainly SMEs) in Switzerland. |

Table 4: Digital strategy frameworks for evaluation - Overview

The four frameworks are analyzed along three categories:

- 1) a general description of the framework
- 2) the process they suggest and elements they include and
- 3) an evaluation of it characteristics regarding usefulness and practicability for SMEs.

4.2 Framework A: Berlin Management Model for Digitalization

4.2.1 Description

The authors (Adlmaier-Herbst & Schildhauer, 2017) describe digitalization as a strategic

¹⁰ Industry-specific frameworks from large consultancies were not evaluated, since they do not specifically refer to SME.

business process that includes an „ambidexterity“: on one hand, to optimize existing processes - the daily business - systematically, and, on the other hand, to create new business models and business options. They define the goal of digitalization: to use new technologies for creating completely new customer experiences and market them successfully.

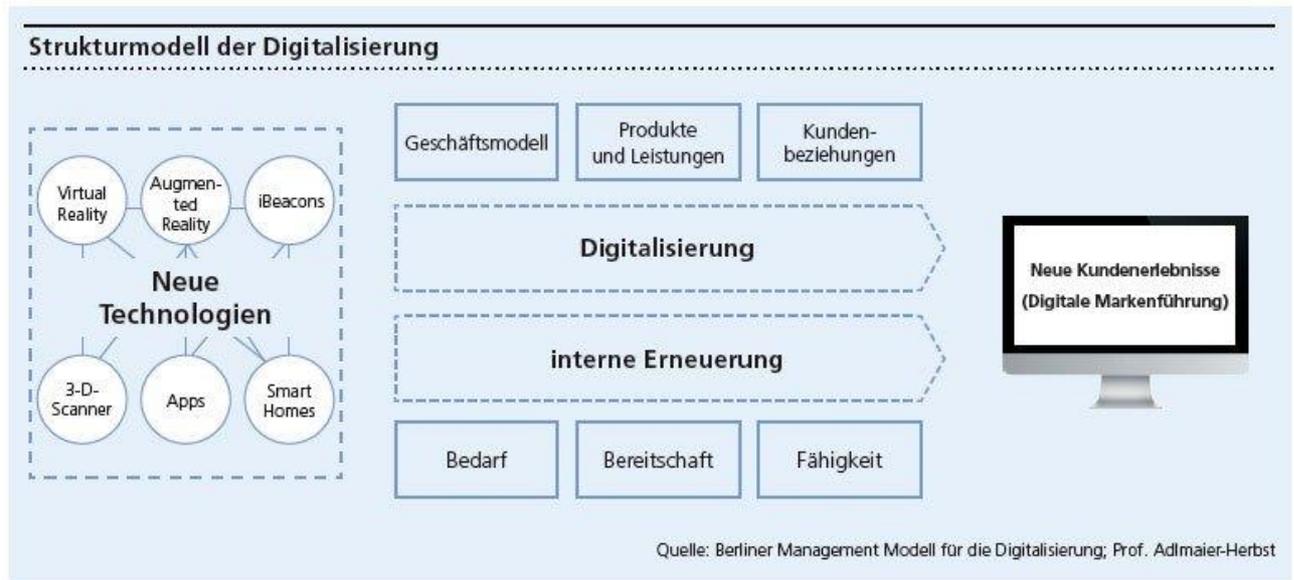


Figure 5: Berlin Management Model of Digitalization

4.2.2 Process and elements

The model uses a five-step process derived from general strategic practice (analysis-planning-delivery-controlling) and adds an extra step that includes a people-focus (readiness & enablement). For each process step of the digital strategy, the framework describes the most relevant elements:

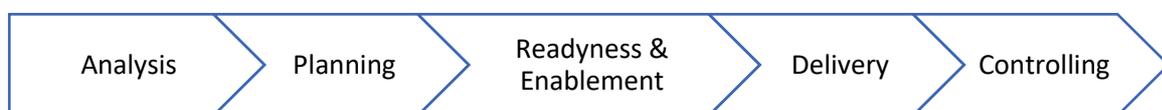


Figure 6: Process of the Berlin Management Model of Transformation

Phase 1: Analysis

The analysis phase contains three consecutive steps:

- 1) Gathering of information in the main categories of digitalization (new technologies, business model, products and services, customer relations and customer experience) and internal transformation (with the dimensions readiness and ability)

- 2) Evaluation of the information (with a SWOT analysis) and prioritization of the results
- 3) Deduction of the required tasks in all digitalization and internal transformation dimensions

Phase 2: Planning

The planning contains three main elements that influence each other:

- 1) Goals for digitalization and internal transformation: they are needed for clarity, controlling, coordination and motivation
- 2) Definition of digital strategies to reach the goals
- 3) Definition of means and measures
- 4) Optional elements (resulting from the above main elements) are time- and budget planning.

Phase 3: Readiness and enablement

The third phase has a focus on the internal transformation by creating readiness through motivation.

- 1) It depicts three main motivational forces for the creation of readiness: performance, bonding and power motivation.
- 2) In a second step, it includes enablement in various aspects: people, roles & responsibilities, processes, structures, IT and culture.

Phase 4: Delivery

The delivery phase focuses on the implementation of the means on an operative scale. It is not described any further in the model.

Phase 5: Controlling

The controlling is done at three points in time: before the process of delivery, during the process and after the process. The framework emphasizes the creation of measurable goals for controlling purposes.

4.2.3 Characteristics and evaluation

The framework is organized along two core areas: the digitalization (in three main areas: business models, products & services, customer relations) and the internal transformation that is necessary to perform the digitalization. The focus of the model is, in terms of

digitalization, on customer experience and customer relations. IT-technology is seen as an enabler, but not the most relevant part of the framework. It has a very strong focus on the internal transformation, including separate process step for internal readiness and enablement. This distinction is unique among the digitalization models. Process optimization or technology infrastructure are only included as “aspects” of the internal transformation.

While the description of the first steps of the process is quite clear, the final two phases (delivery and controlling) are not very specific and not part of a strategy, but an implementation process. Furthermore, it is not clear if delivery includes the completion of means and measures, or just a definition. With a focus on marketing, procedural aspects tend to fall short.

The framework is of high practical value for SMEs that put a strong focus on internal change – on motivation and enablement of employees. In particular, the focus on recognizing and creation motivation in three different areas (performance, bonding and power) provides a helpful focus for companies where change is of high importance. The framework is less helpful for companies with a stronger focus on processes and IT, since these dimensions are not addressed in particular. It includes an easily understandable description of the analysis and strategy-finding phase, but lacks clarity in the planning elements and the results of a strategy process. For SMEs, the goal definitions given as examples (for example: use of social media platforms as customer relations goal) seem to be not specific enough to really start with the implementation of a strategy. The strength of the framework is its focus on change management, but it lacks definition for the transition from strategy definition to delivery.

4.3 Framework B: Roadmap to the digital transformation of business models

4.3.1 Description

Schallmo et al. (Schallmo & Rusnjak, 2017; Schallmo & Williams, 2018; Schallmo et al., 2017) provide an in-depth description of the steps, the process, and the tools used for digital transformation. Both starting and end point is the business model. The framework defines also parts of a business model change (and not only a complete new business model) as

digital transformation. The framework considers the whole industry value chain, putting a focus on technology and market drivers.

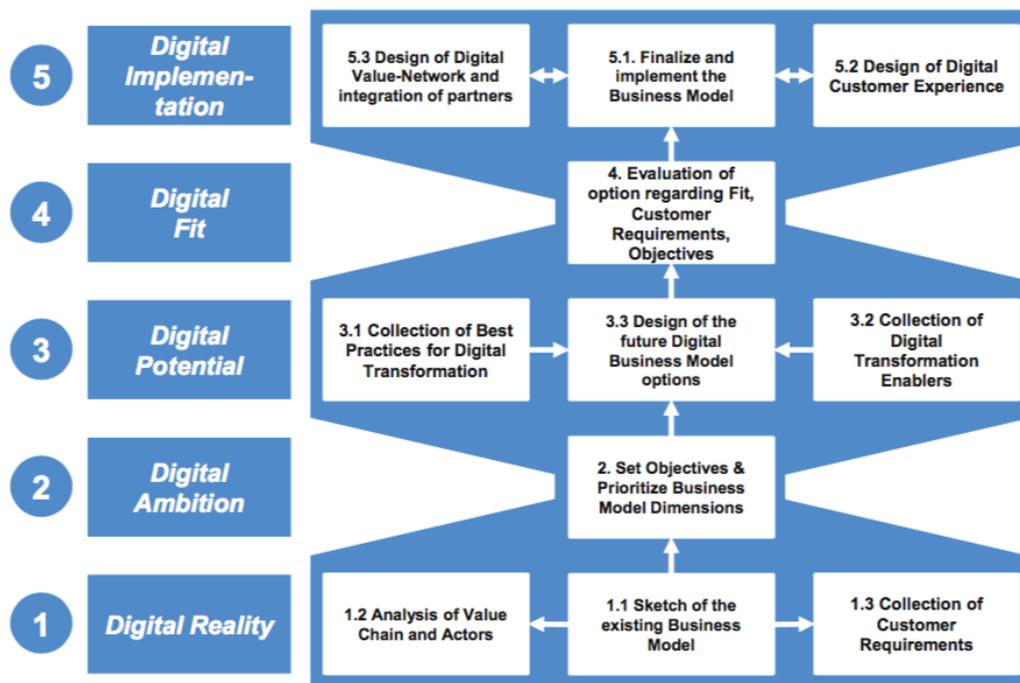


Figure 7: Roadmap to the digital transformation of BMs (Schallmo & Williams, 2018, p. 42)

4.3.2 Process and elements

The framework also uses a five-phase approach, derived from the analysis of digital strategy frameworks. Each phase includes one to three elements.



Figure 8: Process of the Roadmap to the digital transformation of business models

Phase 1: Digital Reality

The existing business model and eco-system are in the center of the first phase that involves three elements:

- 1) Outline of the existing business model (the author uses a slightly adopted version of Osterwalder's business model canvas)
- 2) Analysis of the value-added chain and stakeholders in the industry (market and stakeholder analysis)
- 3) Survey of customer requirements

Phase 2: Digital Ambition

In the second phase, objectives for the digital transformation are defined. These objectives relate to time, finances, space, and quality aspects of the business model (for instance cost savings, faster service provision). The objectives and business model dimensions are then prioritized.

Phase 3: Digital Potential

The third phase establishes options for the future business model(s). It includes three elements:

- 1) The collection of best practices from within and outside the industry
- 2) The collection of enablers in four categories (data, automation, customer access and networking). The enablers are thus technology trends.
- 3) The design of future business model options: this could be on elements of the business model or involve the complete business model change

Phase 4: Digital Fit

The fourth phase evaluates the suitability of the digital business model by defining appropriate options and integrating them into the existing business model. It also includes the fit with customer requirements and the defined objectives. The digital fit is evaluated along two paths: the internal digitalization (services, internal value creation) and external digitalization (customers, partners, external value creation).

Phase 5: Digital Implementation

The fifth phase includes the creation of a project plan and plan of action to implement the business model. The elements in this phase are

- 1) The finalization and implementation of the business model (including a project plan)
- 2) The design of the digital customer experience
- 3) The design of the value network and partner integration

4.3.3 Characteristics and evaluation

The framework strongly emphasizes a systematic approach concerning the value chain and value creation network, thus emphasizing the role of a business within its industry and network. Furthermore, it includes an evaluation of various future business model options. Contrary to other frameworks, this provides a detailed description of the tools to be used in

each element. Another key feature of the model is a definition of objectives, activities and results for each phase, which helps to understand the process steps.

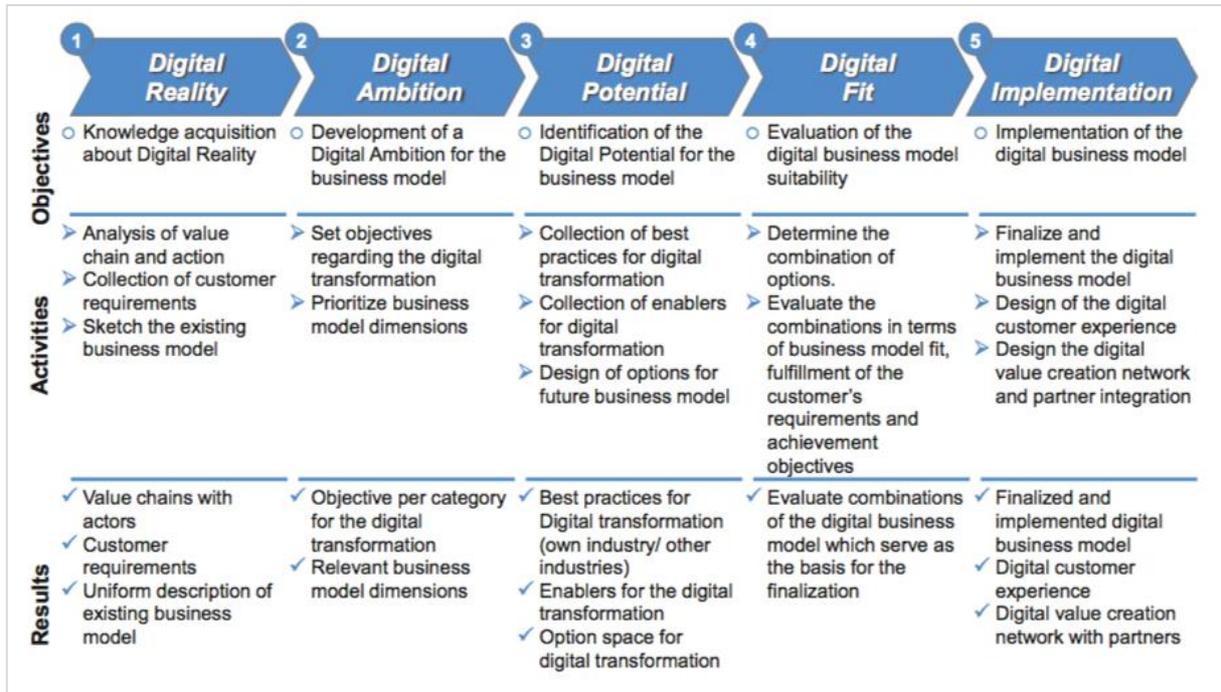


Table 5: Procedure Model with description of objectives, activities and results (Schallmo & Williams, 2018, p. 66)

IT and technology play only a minor part in this framework, while the strategy finding phase is long (ambition, fit and potential). Interestingly, digital ambition is set before the evaluation of technology trends (collection of enablers). For SMEs, the strategy finding process is too detailed, involving three separate steps, while IT/technology parts are missing. The strength of this framework is the business model a central element for transformation. For practicability, digital potential, ambition and fit need to be consolidated. The description of how to get from strategy to action, or how to finish the strategy process, is not detailed in comparison to the other parts. All three elements of the implementation phase include both the planning and the implementation itself. For SMEs which are more implementation oriented, this gives not very much guiding in this final phase. Also, complete business model changes, or the development of several business models for the evaluation of the best fit (the fourth phase) is probably too complicated for SMEs. Cultural and leadership implications are not addressed separately. Overall, the framework describes a very thorough process for the creation and evaluation of new business models. With a strong business focus, two other areas that are highly relevant for SMEs, fall short: the leadership and culture question – how these changes could be implemented; and the necessary steps to get

to the implementation itself. As such, the framework is more oriented towards larger companies where business model innovation is developed separately from the operational entities.

4.4 Framework C: Digital transformation strategy roadmap

4.4.1 Description

The digital transformation strategy roadmap was developed in 2014, as part of a wider set of strategic tools by the digital transformation alliance. It is now promoted by an agency (Strategy&Transformation) (Esser, 2014, 2017). It describes a general approach for a process for digital strategy generation, noting that a detailed strategy roadmap is always specifically tailored to a company. The framework is modular, since digital strategy is seen as either independent or to be part of a general company strategy.

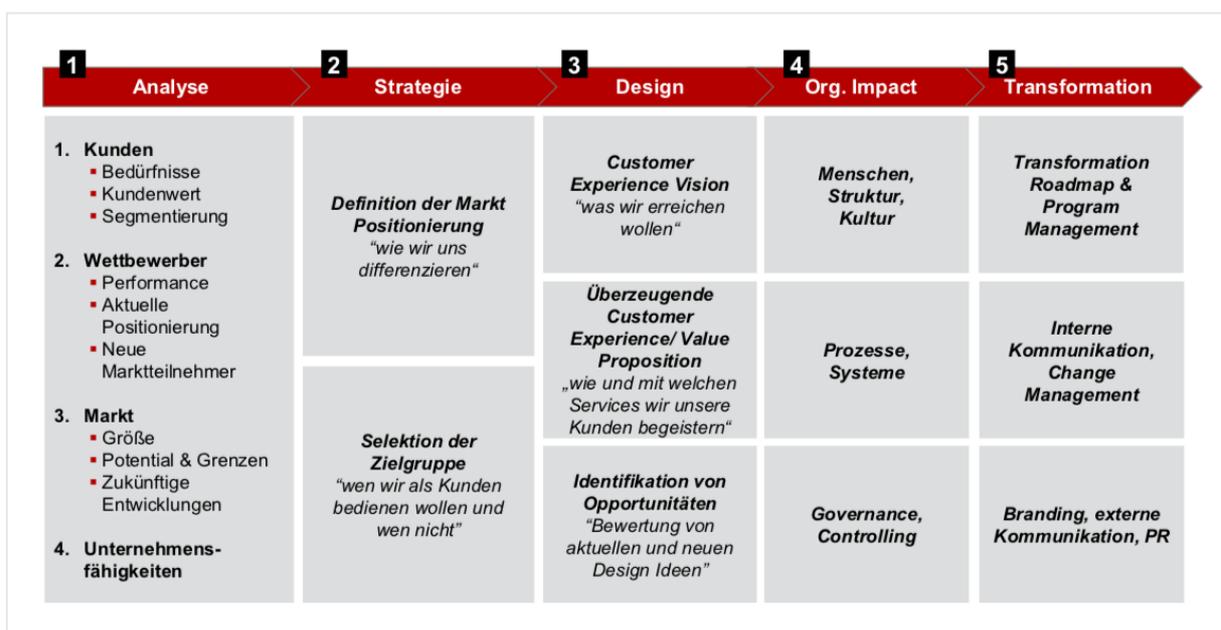


Figure 9: Digital Transformation Strategy Roadmap (Esser, 2014)

4.4.2 Process and elements

The framework uses a five-step-process with a generic approach, with no specific description of the individual elements.



Figure 10: Process of the Roadmap to the digital transformation of business models

Phase 1: Analysis

Phase 1 focuses on four areas: customers, competitors, markets, and business capabilities. Customer needs and values are analyzed and segmented. Competitors are described and measured by their current (market) performance and market positioning. Newcomers to the market are also considered. The market is analyzed according to its size, its potential, its limitations, and future developments. Finally, available business capabilities are gathered.

Phase 2: Strategy

The second, strategy phase includes defining market position, deciding how the business wants to differentiate itself, and selecting the customer target group.

Phase 3: Design

The third phase is a further sharpening of the strategy. It includes three elements:

- 1) a vision for the customer experience, including the goal
- 2) the value proposition, answering “how and with which services to excite customers”
- 3) the identification of opportunities, which assesses current and new design ideas

Phase 4: Organizational Impact

The fourth phase is the application of the previous phases to several dimensions:

- 1) Organizational impact refers to the people, the structure, and the culture within the business
- 2) In addition, processes and systems are examined, and
- 3) governance and control are defined.

Phase 5: Transformation

The last phase defines the Roadmap and program management. In addition, internal communication as well as change management are planned. Lastly, branding and external communications are defined.

4.4.3 Characteristics and evaluation

The framework is rather generic, since it does not include detailed descriptions of what is included in the steps. The analysis phase contains a very complete overview of relevant elements, including the internal capabilities. The strategy and design phase show a strong focus on the customer dimension, excluding internal or procedural aspects in the strategy

definition. Also, the framework does not include a specific reference to the business model evaluation. An interesting aspect is that the identification of new opportunities follows the market positioning and target group selection; the strategy definition therefore follows directly from the analysis, leaving little room for an evaluation of several new opportunities.

The framework includes a separate step for the definition of organizational impact, but no direct reference to IT/technology. In the organizational impact phase, several dimensions (people, culture, structure, processes) are included, without a direct reference what needs to be defined in the strategy phase. Governance and controlling as separate elements of the framework are unusual and might not be of the highest relevance to SMEs. Both final phases (organizational impact and transformation) are not as clearly defined as the analysis phase. The framework might therefore be too broad to be understood by SMEs, in particular concerning the later stages of the strategy process.

4.5 Framework D: Procedure model for the digital transformation

4.5.1 Description

The framework was developed in alignment with and as a result of a survey conducted by the FHNW School of Business in Switzerland in 2017 (Peter, Marc K., 2017, pp. 123–125). It includes seven dimensions (areas of action) that were identified in the survey of more than 1800 companies, many of them SMEs. It describes an approach in three major steps, starting with a maturity -analysis. The framework is specifically targeted at SMEs.

Vorgehensmodell für die Digitale Transformation

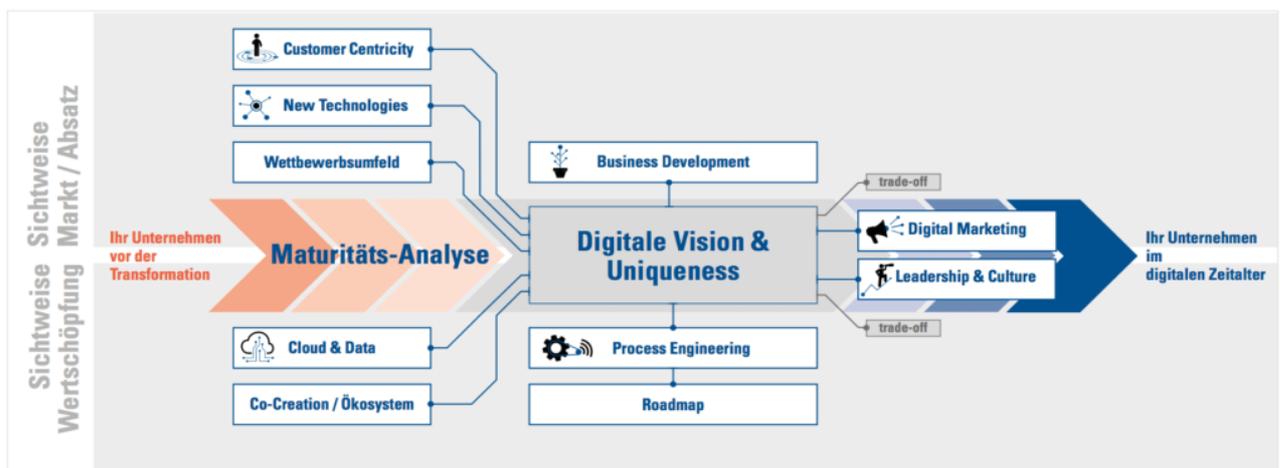


Figure 11: Procedure model for the digital transformation (Peter, Marc K., 2017, pp. 123–125)

4.5.2 Process and elements

The framework promotes a three-step process that is based on a change processes defined by Kurz Lewin in 1947 (unfreeze – move – freeze) and adapts the formula to unfreeze – transform – remain agile (Peter, Marc K., 2017, p. 9). The resulting three-step process can be defined as the following:



Figure 12: Process of the “Procedure model for the digital transformation”

Phase 1: Unfreeze - Analysis

This phase starts with a maturity analysis to identify the most relevant indicators for transformation projects.

- 1) The maturity analysis includes the following components:
 - a. The recognition of customer requirements
 - b. The development of digital business options
 - c. The organizational inclusion of and usage of these options

It is accompanied by additional relevant areas (dimensions) of sales/market analysis:

- 2) Customer centricity
- 3) New technology evaluation, including potential future scenarios
- 4) An analysis of the competitive environment and market opportunities

Furthermore, two dimensions related to value creation are analyzed:

- 5) Evaluation of cloud and data potential
- 6) Co-Creation and eco-system

Phase 2: Transform - Strategy Development

The second phase comprises several elements and dimensions:

- 1) The digital vision and the uniqueness of the company are developed; uniqueness both in terms of market delivery and core processes
- 2) Development of new business models
- 3) Process engineering: a map of the core processes that is the basis of the organization of the company, the IT requirements, and the delivery plan

- 4) Roadmap development: the definition of projects with tasks, responsibilities, time-frames and budgets

Phase 3: Remain agile – Implementation

The third phase consists two major elements:

- 1) Leadership & culture by creating common values and rules, by creating platforms for knowledge-exchange and enablement of people
- 2) Digital marketing includes the implementation of all go-to-market functions (sales, marketing, service) to strengthen the customer centricity and to enhance the value chain

4.5.3 Characteristics and evaluation

In the procedure model, a dual approach is used. One is driven from the value add view, one from a sales/market view. Interestingly, the seven dimensions (areas of interest) are each assigned to one phase of the process. This results in some ambiguities regarding the third phase, since most dimensions are already treated in the first two phases. The third phase of the strategy process is already the implementation of the strategy. One of the benefits of this method is that the framework is very easily understandable and intuitive, which is of high importance for SMEs. The trade-off is an “overload” of topics in the first phase, and a restricted third phase with the focus on marketing. The distinction between new technology and data/cloud potential is not quite evident and might be intimidating to SMEs. The exploration of co-creation and ecosystem opportunities is part of the analysis-phase – in relation to the survey-results, this might be rather ambitious for the beginning of the strategy process. The second phase of framework is quite comprehensive, with a clear definition of the tasks to perform to actually deliver. The third phase that is described in the framework, the implementation phase, is very marketing-focused in its description. It contains no hints to the implementation process along the various dimensions. Similar to framework A, it specifically includes culture & leadership in the rollout process to achieve results.

For SMEs, this framework provides a clear guidance, contains all the relevant elements, and is easily understandable. What might be difficult to comprehend is the broadness of topics at the start of the process that is not mirrored in the implementation phase.

4.6 Overview: process

The process steps of the four frameworks, as well as other selected frameworks, can be aligned according to three major phases:

| | Phase 1 (Analysis) | | Phase 2 (Definition) | | | Phase 3 (Planning) | |
|--|-----------------------------|------------------|--------------------------|--------------------------|----------------------|-------------------------|--------------------|
| Framework A | Analysis | | Planning | Readiness and Enablement | | Delivery | Controlling |
| Framework B | Digital Reality | Digital Ambition | Digital Potential | Digital Fit | | Digital Implementation | |
| Framework C | Analysis (DMA) | | Strategy | Design | Organisation. Impact | Transformation | |
| Framework D | Maturity Analysis | | Transform | | | Implementation | |
| McKinsey (Dahlström, Desmet, & Singer, 2017) | Discovering Ambition | | Designing transformation | | | Delivering change | De-risking process |
| Bain (Bain & Company, n.d.) | Digital Departure | | Digital Direction | Digital Vision | | Waves & Stepping Stones | |
| IMD (Wade, Michael, 2015) | Why | | What | | | How | |
| CapGemini (CapGemini Consulting, 2011) | Definition of problem (Why) | | Set Objectives (What) | | | Solution (How) | |
| Mittelstand-Digital | Analysis | | Vision | | | Measures | |

Table 6: Comparison of strategy process phases of selected transformation frameworks

Phase 1 (Analysis) asks the question “why”: in the analysis phase, the current status, but also future ambition is set. The starting point could be a maturity assessment, but also the evaluation of customer requirements, or a technology and trend analysis.

Phase 2 (Definition) starts with the question “what”: in the definition phase, the potential, vision and design of the digitalization are laid out, including relevant internal changes.

Phase 3 (Planning) answers the question “how”: it deals with the definition and planning of the subsequent delivery process, both on a company and a process level. The third phase is the one with the most divergent description in the literature. Often, it is not clear if it comprises already the transformation, or just the planning of the transformation. In some frameworks, the last phase is already the implementation phase. This ambiguity is not helpful for a strategy process. Therefore, I see the planning phase as still being part of the

strategy and not the implementation. Sometimes it is labeled as “operational strategy”, because it already lays out the operational prerequisites for the implementation.

4.7 Overview: elements

The elements distilled from the analyzed framework are summarized along the process steps. For the overview, only elements were used that were mentioned by more than one of the frameworks analyzed. The comparison shows a strong agreement in all of the frameworks regarding customer requirements as starting point, the business model as central element in all phases, and the future customer experience in the planning phase.

Interestingly, the frameworks do not set a focus on IT/technology in the final (planning) phase, while it is included in the analysis phase, both explicit as technology/trend evaluation and implicit in the maturity assessment.

| Elements of a digital strategy framework | Framework |
|--|----------------------------------|
| Phase 1 (Analysis) | |
| Digital maturity assessment | C, D |
| Collection of customer requirements | A, B, C, D |
| Sketch of existing business model | A, B |
| Analysis of value chain and actors/co-creation and ecosystem | B, D |
| Market and competition | C, D |
| Internal resources/know-how (needs) | A, C, (D) |
| Technology (trends) evaluation, (best practices) | A, D, C as maturity assess., (B) |
| Phase 2 | |
| Digital Vision, Objectives, prioritize BM dimensions | A, B, C |
| Goal (+ KPIs) | A, B, C |
| Positioning/Evaluation of options/strategies | A, B, C |
| Design of future business models/strategies | A, B, C, D |
| Design of digital value network, value chain positioning | B, C |
| Phase 3: Planning | |
| Roadmap Development/Tailoring of measures | A, C, D |
| Operating Model/Organisation | B, D |
| Create adaptability/Change Mgmt/Enablement/Competences | A, C, D |
| Collection of transformation enablers/Transformation | A, B, C, D |

| | |
|--|-----------|
| architecture/Exchange platform/Communication | |
| Design Customer Experience | A, B, C D |
| Governance/Rules | C, D |

Table 7: Summary of elements along the process phases

The elements, particularly in the planning phase, show an overlap with the dimensions that are often defined for digitalization. To get clarification, in the next steps, the common dimensions for digitalization are laid out.

4.8 Dimensions of digitalization

Digitalization or digital transformation is a multi-dimensional task encompassing all areas of a company. While the process model of a digital strategy framework lays out the steps and elements involved, the dimensions in a digital strategy framework try to encompass the multiple areas that need to be considered or addressed when a digitalization strategy is developed and implemented. In that sense, they represent a cross-section to the process. Furthermore, they assure that digitalization is not just applied to a specific part of the business.

In some of the processes of digitalization frameworks, dimensions are already partly included in the process and elements (Adlmaier-Herbst & Schildhauer, 2017; Esser, 2014; Peter, Marc K., 2017). In some frameworks, the whole subject of digitalization is aligned along several dimensions (Bain & Company, n.d.). The following section gives an overview of the dimensions of various digitalization frameworks and models. The numbers of dimensions vary in the different models. Often, dimensions include sub-dimensions to include or specify the necessary fields for digitalization. Nevertheless, a minimum of three dimensions is always used.

4.8.1 Overview of dimensions of various frameworks

Capgemini, in cooperation with the Copenhagen MIT (CapGemini Consulting, 2011, p. 47) identified three main dimensions or building blocks with three sub-dimensions:

- 1) customer experience, including customer understanding, growth through selling and processes, and customer touch points
- 2) operational processes including process digitalization, enablement of people, and

performance management

- 3) business models, including digitally modified BM, new BMs and digital globalization

Similarly, the Boston Consulting Group (Boston Consulting Group, n.d.) defines three strategic building blocks. In contrast, though, BCG is using digital customer experience as the starting point rather than a dimension:

- 1) Digital and data-driven offerings and business models
- 2) Digitization at core of business (process, structure)
- 3) Digital capabilities (organization, platforms, partner ecosystem)

Cognizant's Digital Transformation Framework (Cognizant, 2014, p. 4) defines four dimensions for digitalization:

- 1) Products and services
- 2) Operations (Processes and systems)
- 3) Organization (including collaboration, skills and partner ecosystems)
- 4) Customer experience (including digital marketing, touchpoints and customer insights)

The Berlin Management Model for Digital Transformation (Adlmaier-Herbst & Schildhauer, 2017) puts the new customer experience (with a focus on digital brand management) as the goal, and new technologies as the starting point. In between, six "building blocks" representing dimensions.

- 1) New technology/trend analysis
- 2) New customer experience

External digitalization building blocks:

- 3) Business models
- 4) Products & services
- 5) Customer relations

Internal digitalization building blocks:

- 6) Demand, Readiness and Enablement for the following aspects:
- 7) People, Roles & responsibilities, Processes, Structures IT, Culture

In all of these models, technology or IT is not seen as a separate dimension, but rather as a base layer or driver of digitalization. In contrast, several assessments and surveys use technology or data as separate dimensions. This is of particular interest, since these surveys

were conducted with SMEs:

In its “Digital maturity and transformation report”, the University Sankt Gallen (Institut f. Wirtschaftsinformatik, 2017) has identified nine dimensions,, as relevant for digital transformation. The background of the survey is a maturity assessment – the dimensions were developed in feedback cycles of previous surveys. The dimension “transformation management” is unique in comparison to other frameworks.



Figure 13: The nine dimensions of the digital maturity model (Institut f. Wirtschaftsinformatik, 2017, p. 8)

1) customer experience, 2) product innovation, 3) strategy, 4) organization 5) process digitalization, 6) collaboration 7) IT operations and development 8) culture and expertise, 9) transformation management

Similarly, another Swiss survey from the college of North-West Switzerland (Peter, Marc K., 2017, p. 60) used open questions to determine the most relevant dimensions. In their survey, small and medium enterprises were dominant. The resulting dimensions include two related to customer experience and marketing (similar to the Berlin Management Model), and two related to IT technology and data (similar to the Bain Model). Interestingly, structure and products/services were not integrated as dimensions.

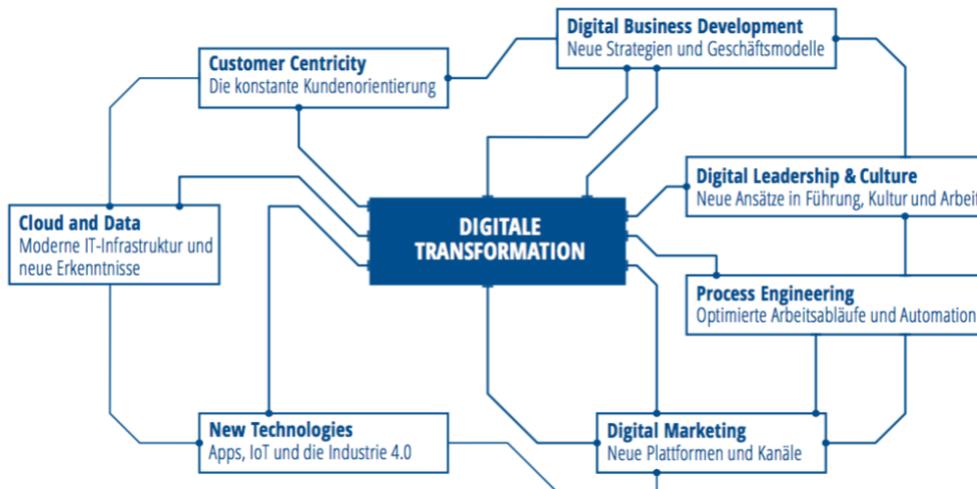


Figure 14: Dimensions of digital transformation (Peter, Marc K., 2017, p. 61)

The consulting agency Bain (Bain & Company, n.d.) has aligned its digital strategy framework along eight dimensions, with two dimensions related to technology (IT, data & analytics) and one specifically to platform and partners. A very interesting aspect of this model is the visual representation of the dimensions, with waves and stepping stones to be defined for each dimension.

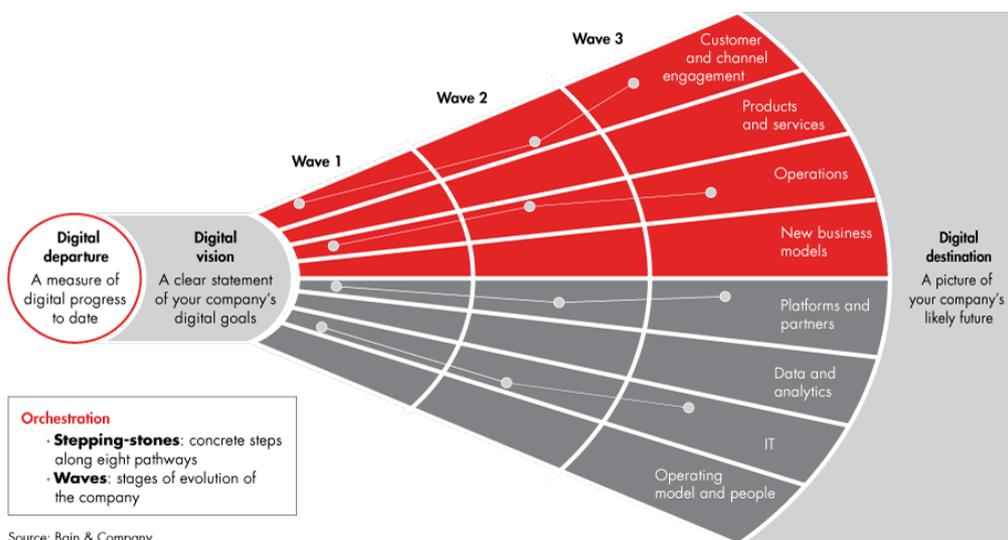


Figure 15: Bain 360 Radar for digital strategy (Bain & Company, n.d.)

The IMD Business School in Switzerland (Wade, Michael, 2015, p. 8) has identified seven dimensions, each led by a leading question; there is no explicit “culture” dimension:

- business model (how a company makes money, including market positioning)

- structure (how a company is organized, in particular affecting the organization of large companies)
- people (which capabilities are needed both from leadership and employees)
- processes (how things are done)
- IT capability (how a company collects and manages information, including data)
- Offerings (a company's products and services)
- Engagement model (how a company engages with customers, but also suppliers)

4.8.2 Comparison: dimensions of digitalization

The table shows a comparison of the dimensions used in the various frameworks. The IMD dimensions are used as a starting point for grouping the dimensions of the other frameworks. The colors are used to show a clustering of the differently named dimensions.

| IMD (Wade, Michael, 2015) | Framework A (Adlmaier- Herbst & Schildhauer, 2017) | Framework C (Esser, 2014, 2017) | Bain (Lancry et al., 2017) | Framework D (Peter, Marc K., 2017) | FH St. Gallen (Institut f. Wirtschaftsinf ormatik, 2017) | Boston Consulting (Boston Consulting Group, n.d.) | McKinsey (Desmet, Duncan, Scanlan, & Singer, 2015) |
|--|--|---------------------------------------|-------------------------------------|--|--|---|--|
| Business Model (how you make money) | Business Model | Strategy | Economic model | Digital Business Development | Strategy | Strategy & Business Model | Strategy and Innovation |
| Offerings (your products and services) | Products & Services | Products / Services | Products & services | | Product- innovation | | |
| Processes (how you do things) | (Processes) | Processes | Operations | Process Engineering | Process Digitalization | Processes Production | Process Automation |
| Structure (how you are organized) | (Structures) | Structure | | | Transfor- mation Management | | |
| | (Organisation) | | Operating Model & Partnership | | Organisation | | Organisation |
| | (Roles& Res- ponsibilities) | Governance | | | | | |

| Engagement Model (how you engage w. customers, suppliers, etc.) | Customer Experience Customer Relationships | Customer Experience | Customer & channel engagement | Customer Centricity Digital Marketing | Customer Experience | Customer | Customer Decision Journey |
|---|---|---------------------|-------------------------------|--|------------------------------|----------|---------------------------|
| People (the people who work for you) | (Know-How) | People | Talent & culture | Digital Leadership & Culture | Culture & Expertise | People | |
| | (Culture) | Culture | | | Working Together | | |
| IT Capability (how you collect & manage information) | (IT) | Systems | Systems & technology | New Technologies | ICT operations & development | | Technology |
| | Controlling | Controlling | Data & Analytics | Cloud & Data | | | Data & Analytics |

Table 8: Comparison of dimensions of selected digital strategy frameworks

The result shows that the following seven dimensions are the most commonly used:

- 1) Business model (including the business ecosystem and new markets)
- 2) Products and Services
- 3) Processes (both internal and customer related processes)
- 4) Customer experience & relationships (including e-commerce and customer acquisition)
- 5) Structure & Organization (including governance & transformation management)
- 6) IT & technology (including cloud & data)
- 7) People & Culture (including know-how and leadership)

People & Culture is often split in two dimensions, for a clearer distinction between leadership&culture on one side, and people&know-how on the other side. Controlling is sometimes mentioned as a separate dimension – this is more of concern with frameworks that include the implementation process. Data & cloud are, due to their high importance, often seen as a separate dimension. Here, they are included in the technology dimensions. The same applies for analytics.

4.9 Summary and Insights

The analysis of digital strategy framework showed that it is useful to define a framework along two axes: the strategy process with its element, and the dimensions that are affected

by digitalization. Each of the four frameworks has a particular focus that is relevant SMEs, but also lacks some parts relevant for them. It is summarized in the following table:

| | Framework | Of particular importance for SMEs | problematic for SMEs |
|---|--|---|--|
| A | Berlin Management Model for Digitalization (BMM™) (Adlmaier-Herbst & Schildhauer, 2017) | Dual approach: digitalization and a focus on internal transformation, in particular creating readiness and enablement to get projects done | Technological perspective is very weak; description of planning phase lacks detail |
| B | Roadmap to the digital transformation of business models (Schallmo & Rusnjak, 2017; Schallmo & Williams, 2018) | Extensive description on business model transformation with a systematic approach, includes the description of tools; the outcomes of every phase are defined | Extensive strategy phase, very focused on business modelling; long-term oriented; cultural changes aspects missing |
| C | Digital transformation strategy roadmap (Esser, 2014) | Strong focus on assessment; in the planning phase, all relevant dimensions are included | Little guidance on the process, and no information on the specific results |
| C | Procedure model for digital transformation (Peter, Marc K., 2017) | Simplicity of framework, with a focus on the analysis phase; includes dual approach: customer value and internal value | Dimensions are more relevant in early than in late stage |

Table 9: Overview of strategy frameworks in regard to SME relevancy

The following findings could be drawn from the analysis:

4.9.1 Process

The process for a digital strategy framework could be clearly identified. While there are minor differences, all processes follow or can be summarized in an identifiable three-step-model. The elements contained in the process vary depending upon the focus of the framework. There are common denominators, elements that are included in all frameworks. These are shown in a comparative table. They will be used as an input for the expert interviews to get further insight on the relevance for SMEs.

A fruitful way of dealing with the complexity of the process that has been adopted by framework A and D. Both use a dichotomy between an internal/external or market driven/value chain view in all three steps. This way of structuring highlights the importance of internal renewal as part of digitalization.

4.9.2 Dimensions

The dimensions show a stronger emphasis related to change management in frameworks resulting from surveys that include SMEs. Furthermore, the internal transformation aspect,

in particular regarding culture, organization, know-how and leadership, are strongly emphasized in some models. This seems to show a higher need for SMEs to consider the internal aspects of digital transformation. Interestingly, the technology-dimension is more often related to the early process of digital strategy, and less to the planning phase. This will be evaluated in the expert interviews.

4.9.3 Industry focus/SME-focus

All digital strategy frameworks reviewed had no specific industry focus. They are all generic enough to be adapted to any industry. Since one part of the frameworks relates to technology/technology trends, industry-specific considerations lie mostly within the application of the elements. The difference for industries can be found in the execution of the framework rather than in the process/dimensions. Another interesting result is that there are no major differences in frameworks that are being developed for large companies and those specifically targeting SMEs. The strategy-finding process is the same; the dimensions that digitalization need to be applied to are similar, too. The difference is in the aspects that have to be dealt with - the strategic option of buying another company is often only relevant for large companies. Similarly, structural options such as setting up a digitalization task-force are not possible.

4.9.4 From strategy to action: planning phase and results

The last phase or phases of the strategy process are the fuzziest one in all the framework descriptions. There is a mixture of elements and dimensions, with little description of actual tasks or requirements in this phase. A clear ending lacks in many of the frameworks. While in some frameworks, the transformation itself is the last phase, in others it is the preparation for the transformation. It is not clearly defined where the strategy process is ending, and the implementation process starts. Therefore, this aspect needs to be clarified in the expert interviews.

5. Expert Interviews

The literature review has helped to identify a process and its potential relevant elements for a strategy framework. Furthermore, the most relevant dimensions for a strategy were reviewed. The survey review has shown the most relevant topics for SMEs regarding digitalization. With the expert interviews, the open questions regarding the gap between theory and practice are addressed. The experts give their opinion on the relevance of elements as well as the actual process and process parameters. Also, their practical know-how regarding the necessary results to start a successful implementation or transformation is evaluated to give input to a strategy framework.

5.1 Selection and sampling

For the selection and sampling of the interviewees, the method of purposeful sampling was used. In particular, the group of interviewees were chosen as homogenous sample to allow in-depth interviews on a very particular subject (Patton, Michael Quinn, 1990, pp. 169–186). The interviewees are all professionally involved in digital strategy development, either while they are working as digital or innovation strategists, and/or because they are teaching this subject at a college or university. All interviewees were from Austria. This follows the purposeful “Criterion I” strategy, where cases are identified and selected that meet predetermined criteria of importance (Palinkas et al., 2015).

The criteria used to establish the sample were the following: interviewees were experts in the field digitalization through either professional experience and/or academic research and teaching and were actively involved with the digitalization of SMEs (either as consultant, or as a responsible person of a program destined to enhance digitalization for SMEs).

To find the interviewees, a combined method of active research and snowball method was used. The active research involved a scan of university and college websites to find experts teaching in digitalization and/or SME. The relevant persons received a mail asking for an interview, depicting the topic of the thesis and the purpose and length of the interview. It also included the question to name other experts.

In total, eight experts were interviewed for input on the digital strategy framework. All interviews were held in April and the beginning of Mai 2018. The average duration of an

interview was 45 minutes. All interviewees gave their outspoken consent to recording and transcribing the interviews. They did receive a short explanation of the purpose and length via email, but no questions. Each interview was started with the introduction of the interviewees and their professional experience in the field of digitalization and SMEs.

| Number | Date | Profession/Function | Digitalization & SME knowledge |
|--------|-----------|--|---|
| 1 | 23.4.2018 | Michael Schützenhofer, founder of strategydesign, a business consultant with focus on digitalization of business models; teacher at colleges and universities in Lower Austria (St. Pölten) | Consultancy focus exclusively on SMEs |
| 2 | 23.4.2018 | Dr. Gerald Silberhumer, responsible for digitalization of the Upper Austrian chamber of commerce with around 100.000 members; responsible for the process digitalization within the chamber of commerce | Develops services for the members (SMEs) regarding digitalization; mainly concerned with micro- and small enterprises |
| 3 | 25.4.2018 | Peter Schnitzhofer, manager of reqpool, an IT company that also offers digitalization strategy for the industry, developed a digital strategy compass together with a the university of Linz | Mostly experience with medium to large enterprises |
| 4 | 26.4.2018 | FH Prof. Mag. Dr. Dietmar Nedbal, research and teaching in digital business at the college of Steyr in Upper Austria for more than 15 years; project leader of a qualification seminar for companies: “digital transformation manager” | Design a project for SMEs (and larger companies): qualification seminar to digital transformation manager |
| 5 | 27.4.2018 | Dr. Gerhard Laga, Responsible for the e-center of the chamber of business in Austria – offers digitalization for its members, mostly SMEs | responsible for “KMU Digital” – digitalization program for SMEs; only indirect knowledge of SMEs |
| 6 | 27.4.2018 | Hubert Preisinger, founder of leapforward, consultant for marketing, sales and innovation; lecturer at the LIMAK business school | consults SMEs, startups and large companies, digitalization in the context of innovation |
| 7 | 2.5.2018 | Mag. Stephan Kraft, program coordinator for the study program “management and IT” at the Danube University | Worked with agencies that supported companies of all sizes before the academic career |
| 8 | 7.5.2018 | Andreas Hladky, founder and CEO of “point of origin”, a digital agency in Vienna that consults SMEs. | Customers from various industries from the SME and NGO sector |

Table 10: List of Expert Interviewees

5.2 Interview guideline

The questionnaire for the semi-structured interviews was divided into five main parts:

- 1) the definition of the terms to set the common ground of understanding,
- 2) the digital framework used, including the elements contained
- 3) the dimensions covered by the framework
- 4) the process of the digital strategy development (including who should be involved, a time-frame and intensity-level for the process)
- 5) the results and artefacts from a digital strategy process.

The detailed guideline in German can be found in Appendix A.

5.3 Data measurement

All interviews were transcribed. The coding was done according to Mayring (Mayring, 2015), using the sections of the interviews as guidance for a mapping of the transcriptions. Since the interview was semi-structured, the reduction and coding in German was done in relation to five main categories: (1) definition of digitalization, (2) elements and dimensions of a strategy framework, (3) process including time and resources, and (4) results and artefacts of a strategy framework. Furthermore, additional questions were asked to directly answer some of the research sub questions (for instance, if an industry-specific framework is necessary or a general framework is feasible). Additional input that could not be coded along the original dimensions was evaluated separately and coded as additional input. The German transcriptions paraphrased into English. Citations were translated to be integrated into the findings. The generalizations were done in English. In the following findings, citations used are partly paraphrases, partly original citations that were translated into English. The number of the interviewee and the lines of the original German transcriptions are added in brackets). An example of the coding can be found in Appendix C.

5.4 Discussion and Findings

The results of the interviews are presented in the form of key findings along the questions of the interviews, and the general research questions laid out in chapter 1.3. Quotes and paraphrases from the interviewees are added with the number of the interviewee, and a reference to the line numbers of the transcriptions.

5.4.1 General findings

5.4.1.1 *Strategy frameworks used*

| Expert | Framework used | Description |
|--------|---|--|
| 1 | Strategy loop | Classical strategy loop used in strategy development |
| 2 | 4 Ps (Product, Price, Placement, Promotion) | Digital technologies to activate one of the 4 “screws” of the 4 P model |
| 3 | Digitalization compass (self-developed) | Uses a three-phase model along five company dimensions: 1) Benchmarking, 2) Vision and Strategy Development, 3) Transformation |
| 4 | No specific framework | Tool-oriented (trend-radar, business modeling, brainstorming ..) |

| | | |
|---|-------------------------|--|
| 6 | No specific framework | Tool-oriented (business model canvas, business model navigator, SWOT, roadmapping) |
| 7 | Classic procedure model | 1) IS- Analysis with PESTLE, Brainstorming 2) definition of what will be done 3) choice of what will be done |
| 8 | No specific framework | Tool-oriented (customer journey) |

Table 11: Expert Interview results: Digital strategy frameworks used

The variety of frameworks used was very diversified. The expert with the strongest IT relation used a framework that was developed by his company. This framework (the digitalization compass) contains several dimensions that are used for a three-step process. The 4P marketing framework (the 4 P's) was used by another respondent who stressed the simplicity of the framework. One of the experts was working with the general model of a strategy loop, another one with a general procedure model that are not specific to digital strategy. Many consultants work rather tool-oriented, using classical strategy tools such as PESTLE, SWOT analysis, brainstorming and business model tools such as the Business Model Canvas or the St. Gallen Business Model Navigator. Similar to the digital strategy frameworks that were analyzed in chapter 4, there was more agreement on the "ingredients" of the early strategy process than the results or artefacts of the process. The business model as a central point of reference is used by one expert: *"I like to start with the existing business model. When we do the strategy process, the business model is always there to reflect the temporary results in it. It is a good top-level for reflection of temporary results"* (Int. 6, 368-372).

5.4.1.2 Definition of digitalization and digital transformation

The answers of the interviews show a similar variety as the reviewed literature regarding the definition of digitalization vs. digital transformation. Seven of the eight interviewees do not make a distinction between digitization and digitalization, since it does not exist in German. Most answers ranked digitalization as the process of transferring analog into digital data without an impact to the business model (and often process-oriented), and saw digital transformation as including a change in the business model. *"Digitalization involves many "small" strategies that involve no risk but optimize existing processes"* (Int. 1, 62-65) sums up this stance. *"There is a difference between digitalization and digital transformation. Digitalization is a must for companies, while digital transformation is more. That means to be able to act from the strategy to the business model to the realization in an ecosystem."*

Digitalization can be anything, like transferring a normal invoice into an electronic invoice” (Int. 4, 31-39). This quote shows that many of the projects that were seen as part of the digital transformation of a company in the surveys reviewed in chapter 3, in that sense would only be a digitalization initiative. Basically, the different opinions on the meaning of the terms reflect the variety of interpretations given in scientific literature. Also, the answers show the unclear boundaries: *“Digitalization might already include transformation. Digital transformation is clear term that indicates the change. The term digital transformation is more reinforcing than digitalization, implying that something changes” (Int. 7, 50-55).*

5.4.2 Findings to Research question 1: Relevant elements of a digital strategy framework for SME

Finding 1.1: A general strategy framework, regardless of industry sector, is applicable.

All respondents agreed that a strategy framework can be applied to all SMEs, regardless of industry sector. This can be confirmed in the context of a digital strategy seen as business strategy with a focus on technology: *“I do not see a big difference between business strategy and digital strategy. My business strategy uses digitalization, period” (Int. 8, 435-442).* The relevancy of an assessment, though, is only seen in the industry context. Furthermore, to identify relevant trends and technologies in the strategy process is seen as part of customization for every company. In summary, a generic framework is feasible for all industries, while industry-specific inputs should be part of the customization, particularly in the area of technology.

Finding 1.2: Four elements are the most relevant in the analysis phase.

There is a high congruence among all interviews about the most relevant element of the analysis phase: a technology/trend analysis, the evaluation of customer requirements, and a market & competitor analysis. These are the main “input” factors for the first phase. An analysis of the existing business model is the fourth element brought up by most interviewees as element for the first phase. Trends or trend-scouting mainly focuses on technology trends, including data and cloud. They are seen as a mind-opener and for the generation of new value creation areas. Additional elements that some of the interviewees referred to are a stakeholder analysis, an ecosystem analysis, and an evaluation of the existing IT-system or technologies used, as well as an assessment of the existing competencies and know-how. Typically, a SWOT-analysis is the result of the analysis phase:

“Most analysis do not have a transition into the strategic direction. For me, a SWOT is perfectly suited to do that. That element, core competencies and competency analysis, I use if needed. Not as a standard” (Int.6, 117-124).

Finding 1.3: A digital maturity assessment is not necessarily required.

At the very beginning of the strategy process, many frameworks suggest some sort of digital maturity assessment. Only one of the interviewees also starts each strategy progress with a digital maturity assessment (DMA). Generally, an assessment was seen as an option, but not a necessity. One reason is that DMAs might be overly complex and tedious: *“I think they are important, but the problem is that they are either superficial or very complicated. Often you forget the reason for using it while handling it” (Int. 1, 440-448).* Another reason that they bring only limited input for the strategy formulation: *“I know five different maturity assessment models. They are helpful for an assessment, but less for strategy development” (Int. 6, 93-96).* In summary, if a DMA is used, it has to be fairly simple.

Finding 1.4: Goals and positioning are most relevant for the definition phase.

Elements of the second phase of the strategy process that were named by most respondents were the development of a vision and a goal: *“There are schools of thought that say that goals are too rigid; but if you cannot define where you want to go, you have a hard time. When I follow a path, I want to see where my goal is. I can make some detours, but at least I want to know where I want to go. I can continually change that, of course, when it makes sense” (Int. 7, 189-196).* Furthermore, the development and choice of one or more potential future business models; the positioning within the future market and competitive landscape, and the identification of potential initiatives or projects to achieve the goals. Financial considerations do play an important role, either in the form of a financial assessment of business model changes, or in the form estimated budgets for projects and initiatives. They are rather a “should-be” than a “must-be”. Additional elements that were considered by some of the respondents, were a scenario analysis or blue ocean strategy to widen the existing view on markets. KPIs could be part of the goal definition, or part of the project definition: the general view is that KPIs are a necessity in digital strategy building: *“We work with goal definitions with measurable, quantitative goals. Even when it is qualitative aspects we try to make them measurable. With different indicators, like a KPI system” (Int. 6, 182-183).* Defining an operational model, in the sense of process/

organization definition is for all interviewees part of the strategy definition: *“Often, there are initiatives that have no technological basis, they only mean change in organizational structure or culture. These are often the initiatives that we align with the dimension “organization”. There are many projects that are defined which are no real IT projects”* (Int. 3, 312-318).

Finding 1.5: Project definition and prioritization are crucial for the planning phase

The most relevant elements of the third phase of the strategy process are the definition of project sheets, project prioritization and the development of a roadmap with milestones: *“Prioritization is absolutely necessary, along several criteria. Especially SMEs need to focus and then really implement well”* (Int. 4, 219-222). The detail of the project definition varied – from just using titles to project cards with a description, budget estimation, risk assessment and further information for each initiative/project: *“The initiatives that we define in the context of strategy definition are then prioritized. They are also defined in terms of cost estimate and impact. These are project overviews with goals, non-goals, risks, involved systems, impact and cost estimates and timeframes. Based on these information, prioritization is done, partly based on dependencies, but also financial means and resources. Or also based on strategic decisions”* (Int. 9, 321-331). Furthermore, the responsibilities for each project need to be defined: *“This is the relevant point: to create responsibilities in the operationalization of the strategy, and to define measurable indicators to assess the results of the doing. What are the benefits and how much does it cost?”* (Int. 2, 548-552). Another element that was mentioned by two interviewees was prototyping: *“Concept prototypes of services can already be developed within the strategy development, to test their viability and to create a common understanding”* (Int. 6, 236-239).

Finding 1.6: IT/technology is only an optional component of the strategy development.

Interestingly, the particular development of an IT/technology plan was only seen by half of the experts as relevant element of the strategy: *“Only the cornerstones of IT are relevant for the strategy phase. If I craft a great strategy and do not consider the IT-systems to support it, or a development would be too expensive, I have developed a bad strategy. This is like asking “which employees do I have?”, “what is the know-how that exists?”, and “what is the legal situation?”. All these components have to flow into the strategy”* (Int. 8, 294-304). Others considered it to be part of the implementation process: *“At the end of the day, I need*

something technical, an IT system, and a team, but this is only relevant when it really goes to implementation” (Int. 4, 227-330).

Finding 1.8: Business model change is at the heart of a digitalization strategy.

There is a general agreement of all respondents that a business model analysis or business model change is at the very heart of the strategy process. A business model transformation can be considered, but more often, it is only a smaller part of the business model that is enhanced. *“When we look at the status quo of a business model, we see a lot of topics to be analyzed. It depends upon the output of the analysis if we think in a radical digital business model. I always include it, not in a form of a radical new model, but the form of a digitally enhanced existing business model” (Int. 6, 329-338).* The smaller the company, the more unlikely a business model change seems to be. Interviewee 2, who is mainly working with small enterprises, summed it up in the following form: *“In SMEs, I hardly see business model innovation - in the sense of developing completely new value propositions or new revenue models. Mostly, digitalization is about digitalizing customer communication, in the sense of Porter's model - they begin using social networks or do online-marketing to show more presence to customers; or they digitize internal processes to save costs. These are the majority of digitalization initiatives I see in reality. The big jumps, the ground-braking changes through completely new business models happen rarely” (Int. 2, 173-183).* The findings correspond with the view of Schallmo (Schallmo & Rusnjak, 2017), that incremental business model change is a likely way to go. As one expert interviewee puts it: *“Whenever you successively digitalize analog businesses, it is rather incremental changes. A process there, a product here. These are small changes. In the mass, this might change a lot, but on the company level, these are small changes” (Int. 2, 574-580).* In summary, a business model evaluation needs to be included in the strategy process. Business model changes are likely or even necessary to be included, while a complete business model transformation is an optional result.

Finding 1.9: Network economy should be relevant; but is often too far-fetched for SMEs.

A separate question was asked regarding the importance of the topic of network economy. Network economy is discussed as part of the business model development or as an eye-opener: *“When I talk about business models, I always bring examples that are global and that are located in eco-system thinking and network effects. This needs to be mentioned,*

platforms are an essential business model as well as services around products. You can enhance a product to an ecosystem, today. And gain network and scale effects ” (Int. 5, 306-312). The relevance that is given to the topic varies strongly. The fear of loss of resources and control are the main reasons why enterprises (particularly smaller ones) are not interested in networking models. Often, network economy is discussed in the strategy process in relation to the existing value chain: *“Network economy definitely needs to be looked at - what is the ecosystem, which structure are followed, how can you best use synergy effects or digitalization effects. Which tasks can be outsourced. Everything that is not part of direct value creation is outsourced - either to partners, suppliers or to customers” (Int. 3,439-447).* On the other side of the spectrum is summarized with the following quote (from interview partner 7 who mainly works with micro- or small enterprises: *“The answer to your question is: the concept needs to be understood, but it is not relevant for the digitalization strategy” Int. 7, 432-433).*

Finding 1.10: Relevant Dimensions of a digital strategy framework

In terms of dimensions, the variety given in the interviews is high. One concept is the alignment along the classical company units. Interviewee 2 is using a digital strategy framework developed by his company with five dimensions: 1) interaction with market & customers, 2) partners and customer relations, 3) value generation processes, logistics and production, 4) Finance, controlling and leadership, and 5) organization, including culture. Know-how is part of all dimensions. One interviewee is using only using three main dimensions for the sake of easy coping: *“The most important dimensions are strategy, culture and technology. These are the three dimensions for applying digitalization. Strategy is "what do I do", technology "how do I do it" and culture "with whom do I do it" and "how can I explain or communicate”. And you have to start with all three of them at the same time” (Int. 8, 188-193).* Several subdimensions (people and skills, leadership, processes, products and services, customer relations and business models) are aligned within the three main dimensions. Expert 2, mainly working with small companies, uses four dimensions in accordance with the 4P marketing model (product, price, place, position): products & services, customer communication, internal processes, customer related processes. Two interviewees use only two main dimensions: business model and change, or business model and processes. Technology and cloud are named as relevant by half of the respondents, and

optional by the other half. Another way to be looked technology is mentioned by one expert: a frame that defines the other dimensions, especially concerning legacy software. In summary, the dimensions business model, processes, customer relations, organization and culture (or change) are the dimensions named by most experts, while technology and/or data are only partly seen as top dimension, or more operational. For the purpose of framework development, the variety in dimensions used can be seen as an indicator that the focus of the operational part of a strategy could vary greatly. A second conclusion to be drawn is that of simplicity: too many dimensions would not support the understandability: *“If I had to pick what is the most important, then that would be business model, business processes, cultural change, people, and IT” (Int. 6, 270-272).*

5.4.3 Findings to research question 2:

What is a process for strategy development that is feasible?

Finding 2.1: A three-step process is feasible.

From the description of the strategy process they used, most experts had a three-step approach: the first step is the benchmarking, or an analysis of the current situation; the most relevant input is gathered. The second step includes a broadening of the view, and then a choice and selection of the focus. The third step consists of the definition of what will be done. *“A classical procedure model starts with an IS- analysis: what is the current position of the company, what are the general conditions, like the PESTLE - analysis. We look what would be possible, in general. We do that very broadly, almost in brainstorming-mode. Then it is about focusing and choosing what to do; from “IS” to “Should be”. Then, in the third phase, the definition and choice what will be really done” (Int. 7, 74-88).*

Finding 2.2: Strategy loops and rolled planning are relevant.

A topic that was brought up by almost all interviewees was the importance of strategy loops (or rolled planning), meaning a revision of the strategy parameters and strategy results in a periodic sequence. Due to the rapidly changing technology, a quarterly revision or re-evaluation of the digital strategy was seen as relevant: *“There are models, I call it strategy sprints, similar to agile working. You actively plan your time once or twice a month or per quarter, depending upon the dynamics of the industry. Management blocks the tie ahead for one to two years, to reach this iteration on a regular basis” (Int. 7, 114-121).* The review would include the most relevant input elements, such as market and technology, but also

the status and prioritization of strategy projects and initiatives, similar to a backlog of themes in scrum. *“You have to look in quarterly or half-yearly rhythms: what has changed in the market, are there new trends, no competitors, are there new specializations? It is a perfecting of the principle of rolled planning, where I constantly monitor the market and reevaluate my planning” (Int. 2, 527-532).* The frequent reviews still require a long-term planning perspective: 3-5 years was the planning focus for most of the interviewees, going as far as 10 years ahead in terms of vision or scenario planning. To find the right balance between long-term planning and flexibility is one of the main challenges in digital strategy development.

Finding 2.3: Three to six months for the strategy process.

Most respondents agreed on a time-frame of a two to three months for the strategy process, with three to five workshops (or the double amount of short workshops) in that period. Between the workshops, additional time is required from the companies. Two experts would rather see half a year as an adequate time for a bottom-up/top-down approach. With larger companies, as alternative to the six months strategy phase, one of the interviewees also considered a different strategy process, involving not only a few people, but around 1/5th of employees. This “bing bang” version of a strategy process would require around 2 months.

Finding 2.4: A diverse team including management is relevant.

CEO and management always need to be involved, as well as stakeholders and decision makers. In SMEs, these are often the same people. Most experts favor a diverse team both in terms of hierarchies as well as business areas. Management involvement is seen as key for the strategy process: only after the management is on board, employees from lower hierarchies should be included. The commitment of the management is also needed in the participation of the workshops. There is a general agreement that customers are not involved in the strategy process itself. They are relevant as input for the customer requirements, and potentially as early feedback possibility when prototypes are used in the strategy process. These customers (or partners) need to be carefully selected if they are to be involved in the prototyping or MVP (minimal viable product) process.

Finding 2.4: Mindset, culture and communication are the levers for success.

To be able to implement a strategy successfully, the levers most often named were

communication, mind-set and culture. Communication was mainly meant internally, but also to partners. *“Simplicity is an important point as in any strategy, and consequence in the implementation. That means that the head of the company has to communicate with his employees and/or network partners” (Int. 2, 389-395).* Communication was often mentioned together with mind-set: *“Mindsetting is a relevant topic, and also of major importance with the internal communication. This is of major importance before doing anything else” (Int.1, 284-297).* This is similar to the focus on internal change in the Berlin Model of Management, where the authors defined a separate phase as “Readyness and Enablement” (see 4.2.2). The mind-set is relevant in two senses: as the mind-set of the owner/management to start and continue the process: *“Having a vision, looking into the world, not being held back, be daring - that is all included in the mind-set. (Int. 8, 538-540)”*, but also as the relevant factor that has to be set with employees. A broader term that encompasses that is culture or change: *“That is one of the main success factors for it to happen. If you call it change or culture or whatever, but in the end, it is people that have to implement it, so that has to be put in the first order” (Int. 8, 172-178).*

Finding 2.5: Processes and responsibilities are levers for success.

Besides the cultural aspects, organizational aspects were identified that are needed to increase the chance of success of implementation: to consider the roll-out in the planning, to define clear processes and responsibilities, and to define small, incremental steps: *“For the implementation it is important to consider the roll-out beforehand, and who to integrate into the strategy development. Necessity to get a critical mass that is informed and involved” (Int. 6, 219-223).* In general, change management practices need to be part of the implementation plan: *“Working on the culture is needed, and have an evangelist, someone who is always pushing. Furthermore, it is not about setting singular accents, but about a general establishment. Such things as design thinking, workshops and the like that lead to fast solutions” (Int.7, 251-257).*

5.4.4 Findings to research question 3:

What are the expected results of a digital strategy?

Finding 3.1: Simple, visual results are relevant.

The common ground for all the answers was that a written document with a detailed strategy is not relevant at all. One interviewee uses the business model canvas in connection

with story-telling: *“I am not a fan of 20-page documents that nobody reads. For me, it is important to create a pull that people are motivated and continue to think in their own responsibility. I personally love Osterwalder's business model, because it is very clear and graphical, and combine it with storytelling”* (Int. 1, 576-581). A high degree of visualization and understandability is relevant: *“It is important that it can be communicated easily internally and externally. Less text and more graphics are better”* (Int. 7, 526-534).

Furthermore, the results need to be broken down for the specific company. The most relevant artefacts should be: the vision, the goals, the roadmap. Several experts mentioned that they did not like action plans in the form of excel sheets or word-documents, since they are not really used. Furthermore, the business model canvas and prototypes, as easily understandable means of communication, were seen as relevant. The operationalization of the strategy includes a time-frame, including visually aligned projects that answers the classical questions: what, who, when.

Finding 3.2: A roadmap with visual elements (projects, milestones) is essential.

A roadmap is one of the most important results of the strategy process. Rather than an action plan, a roadmap contains a visual element. For expert 6, the roadmap is the strategy: *“The strategy formulation is the roadmap. It is a synonym”* (Int. 6, 161-162). He goes on to explain the scope: *“At the end of the strategy is a multiprojector. That means that the roadmap contains the projects that will be implemented with names and time-frames, the expenditures, coordinated according to dependencies”* (Int. 6, 490-492). Within the roadmap, there are three to four topic-streams: market-oriented, technology-oriented, information-oriented and resource-oriented. Another interviewee sums up the relevance of the roadmap for SMEs: *“Roadmap must be part of strategy. It sets the relation the real field of action. A strategy often looks like a vision paper that says what I want to do in the future. But the quality is only right when the plan is included with exact dates and priorities. Therefore, it is of high relevance to include initiatives, milestones, and actions. Otherwise, I would not know where to start”* (Int. 8, 447-475). The roadmap should also include projects of various dimensions, including cultural or organizational issues.

Finding 3.3: The time-frame for the strategy is 3-5 years.

Most respondents would formulate the strategy for 3 years, or even 3-5 years. A 10-year vision was also given as an option: *“Strategy needs to deliver a clear picture of what*

digitalization in my industry means now and in ten years” (Int. 8, 368-374). For the first month, the projections should be more detailed, or “Quick-Wins” should be identified.

Finding 3.4: The big IT-picture is not necessarily part of the roadmap.

Since technology is the starting point of a digitalization strategy, one would assume that it will also be part of the strategy formulation. The answers of the experts show a different picture, since some see an IT landscape only on a very abstract and strategic level: *“IT landscape would be more in IT strategy than in business strategy” (Int. 7, 587-589) or “IT landscape should be part of strategy, but on a rather abstract level, which shows roughly where the company is today and how it will be in the future” (Int. 8, 470-475).*

6. Digitalization: a framework to get from strategy to action

The digital strategy framework suggested in this chapter is derived from an in-depth literature review of existing frameworks and concepts (see chapter 4) and the input from the expert interviews (see chapter 5). It also includes findings from recent surveys outlined in chapter 3 where they were applicable to the strategy development progress.

6.1 Introduction of framework

The digital strategy framework developed in this thesis uses a **simple three-step process**, including **relevant elements** that need to be addressed in each phase. Furthermore, it includes the **six most relevant dimensions** that need to be considered in a digital strategy process. The transformation or implementation itself is not part of the framework. The strategy development process ends with **clearly defined results** before the implementation.

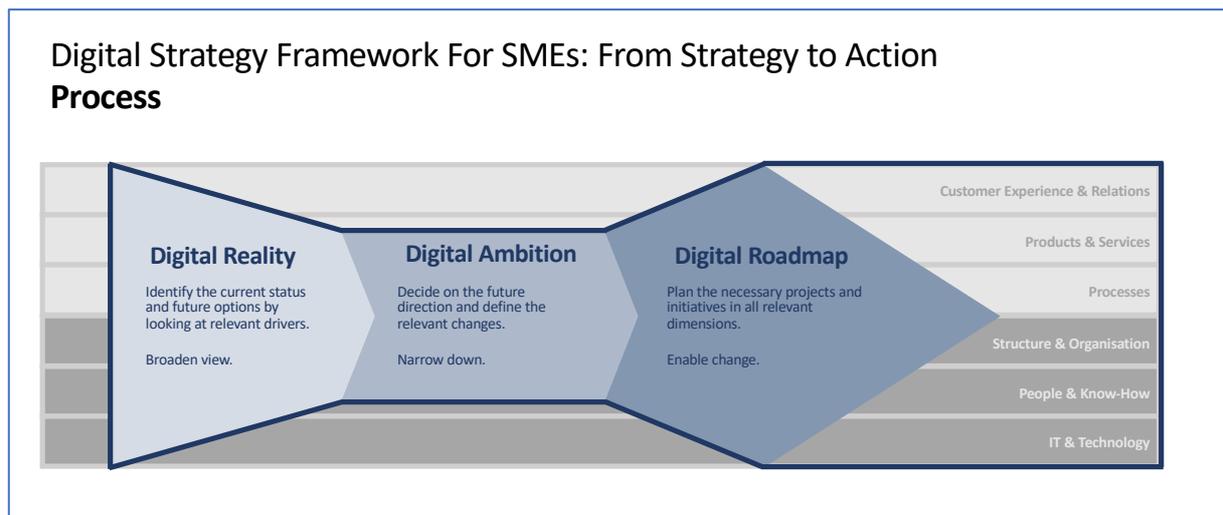


Figure 16: Digital Strategy Framework: Overview of process steps

The focus of the framework is to set a clear path for delivering results that can be put into action. The framework includes key features:

1) The framework is set in a simple graphic representation for easy understandability.

Furthermore, the layout visualizes two key concepts:

- the broadening of the view in the first phase, the focusing in the second phase, and the broadening again in the third phase.
- the distinction between an external and internal stream, in analogy to framework A and C analyzed – thus signaling the importance of external/market-oriented

transformation changes as well as the internal transformation and value chain.

The distinction is visual, but not outspoken.

- 2) The framework introduces required and optional elements in the process. This is the result of balancing strategic necessities on the one hand, and limited resources and time on the other hand. This might also make it easier for SMEs to start the process and add further elements along the way. Furthermore, the expert interviews showed that there is congruence about the most relevant elements.
- 3) The framework aligns six dimensions with the process. To ensure that digitalization encompasses all the relevant dimensions, they are an inherent part of the framework. At the same time, it allows companies to set a focus on only one or two dimensions as a starting point, but still see the interdependencies. The six dimensions are of particular relevance in the planning phase.

6.2 Process of the digital strategy framework

The framework uses three steps for a process, in analogy to some of the frameworks that were analyzed. It avoids too many steps in the strategy definition itself that might lead to confusion for SMEs between notions like “digital potential”, “digital fit”, and “digital ambition”. The third phase of the process finishes with the planning of the strategy and does not include the implementation. Therefore, a clear definition of the ending of the strategy is inherent. This is supported with the definition of an outcome. The time-frame of the process is 6-12 weeks for not losing the momentum.

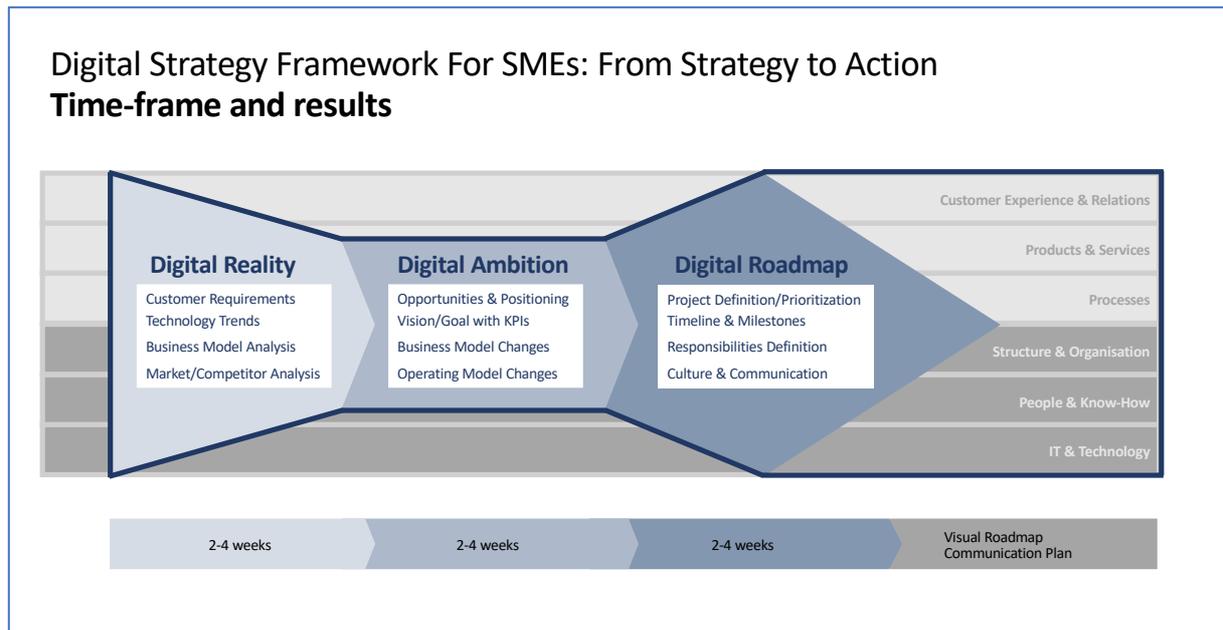


Figure 17: Digital Strategy Framework: Process with required elements

Phase 1: Analysis (“Digital Reality”)

In the analysis phase, the question **why a digital change is needed** will be answered. This phase includes a review of the internal and external factors relevant for the company. Often, the process starts with a specific pain or necessity, but should include a broader picture. The required elements in this phase are:

- 1) The gathering and evaluation of customer requirements
- 2) The exploration and evaluation of technology trends
- 3) An analysis of the current and future markets and competitors
- 4) An analysis of the existing business model in regard to the external factors

Optional elements in this phase are:

- 5) An analysis of the existing value chain, actors and eco-system
- 6) An evaluation of internal resources and necessities
- 7) An inventory of the existing IT-systems.

Phase 2: Definition (“Digital Ambition”)

In the definition phase, the question **what will be changed** is answered. This phase essentially defines the future direction of the company. To achieve that, the starting point is as broad as possible, in creating potential new business opportunities and business models. Then, a vision is developed, the options are narrowed down to clear goals and according

strategies, the relevant business model changes and the equivalent changes in the operating model – the structure, processes and organization.

It includes the following elements:

- 1) An outline of opportunities and clear positioning
- 2) A digital vision and goal(s) definition with KPIs
- 3) The business model changes or new business model
- 4) The operating model changes or new operating model – essentially, this defines new structures, processes and organization within the company

Optional elements in this phase are:

- 5) Scenario developments for the future
- 6) The use of best practice models
- 7) The definition of business cases

Phase 3: Planning (“Digital Roadmap”)

The planning phase defines **how the strategy will be implemented**. This is the most relevant phase in the process to really get into action afterwards. The planning phase narrows the potential initiatives to manageable projects in accordance with existing (and future) resources. One of the most relevant aspects of the digital roadmap phase is the planning of initiatives and projects along six dimensions (see 6.4). This helps to align the different relevant initiatives and to keep the picture that digitalization involves all areas of a company. The planning phase is clearly project-management oriented. Therefore, the necessary elements include at least:

- 1) A definition and prioritizing of projects and initiatives
- 2) A timeline with milestones and dependencies
- 3) The setting of responsibilities (the who, what and when) of the projects and initiatives
- 4) The change requirements for the organization

Optional elements of the planning phase are:

- 5) Prototyping
- 6) A detailed project/initiative description
- 7) The future functional IT landscape or IT requirements

6.3 Elements of the digital strategy framework

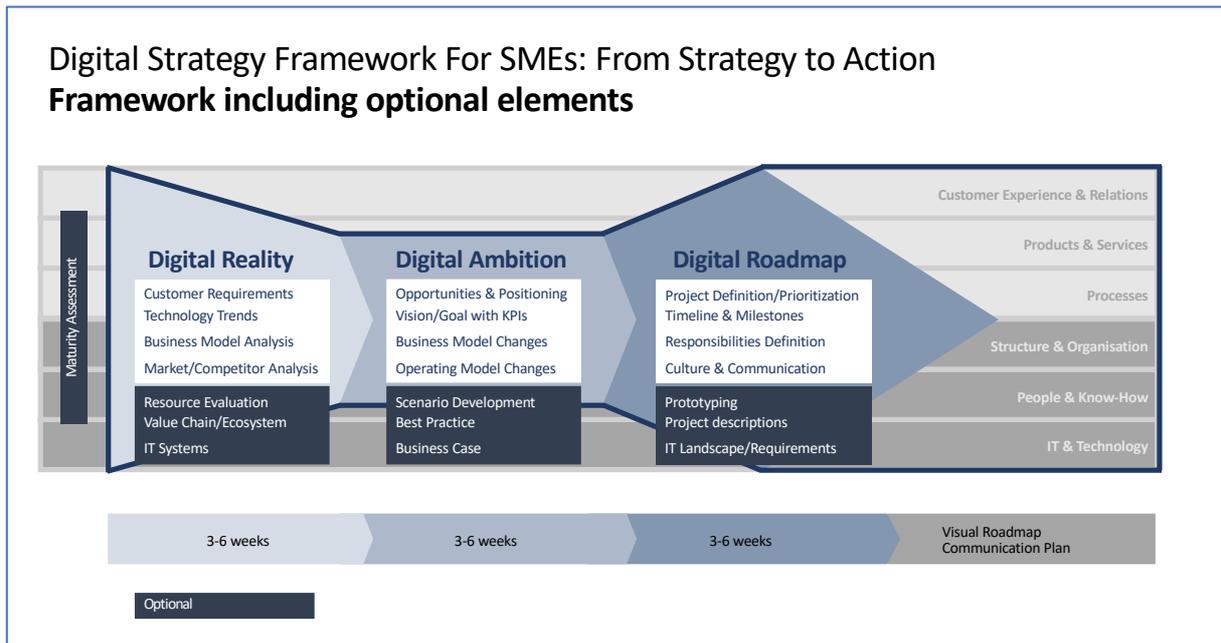


Figure 18: Digital Strategy Framework: optional and required elements

One of the key features of the framework is a distinction between required and optional elements. The elements include the relevant aspects that need to be explored in the digital strategy process. “Required”, in that sense, means that they are needed to create a sound strategy. The distinction will assure a certain flexibility in the strategy process. The depth of analysis, exploration or definition of each element, as well as the methods used, are not part of the framework. They can be chosen individually from a wide array of existing strategy, project management and design thinking tools and methods.

This section gives a short description of both required and optional elements.

6.3.1 Digital Maturity assessment (optional)

Assessment models that exist (Esser, 2017; Jodlbauer & Schagerl, 2016; Peter, Marc K., 2017) try to give a clear picture of the current status and establish a certainty about the current and the desired status. They generally result in a gap analysis along several dimensions and often more than hundreds sub-categories. While this is helpful for some SMEs, it can also be too rigid to perform an assessment along predefined parameters. Furthermore, assessments are generally industry-specific to provide relevant information. Finally, due to the rapid technological development, many assessments dealing with technological alignment are not always up-to-date. Assessments are helpful when available for specific industries, when the

exact cataloguing can be enlightening for a company, and with a strong focus on the technical part of digitalization. They are less helpful in terms of market positioning. For SMEs, they have to be simple – with the trade-off of reduced insight. Therefore, they are considered an optional element of the strategy framework.

6.3.2 Elements of the analysis phase (“Digital Reality”)

6.3.2.1 *Customer Requirements (required)*

Customer requirements are often the starting point of a digital strategy process. There is a common understanding that customer touchpoints, customer experience and customer requirements are drivers for digital change. The analysis of customer requirements needs to be done with regard to future options and changes. Possible methods include surveys, personas, value mapping, customer journey mapping, jobs-to-be-done framework, interviews, focus groups and analytics data. The choice of customer segments is of relevance in terms of input: a lead user approach will result in more radical ideas than an average user questioning; (potential) new customer segments will bring different insights than existing customers.

6.3.2.2 *Technology trends (required)*

Technology trends are the second main starting point for a digitalization strategy. The knowledge about the technology as well as the evaluation of relevant technologies for the own company are of major importance and often the reason for change. Technology trends might be industry-specific (such as 3-D printing, sensory input), or so general that they have relevance for every company (such as social media, cloud services, or data analytics). They serve as an eye-opener to broaden the horizon of potential future business opportunities. Often, technology trends are presented with best practices in the same or other markets. The evaluation of opportunities provided by the usage of data or cloud services is part of the element “technology trends”.

6.3.2.3 *Business model analysis (required)*

The business model analysis is a prerequisite for understanding potential changes, the impact of digital technology on the business, and future value creation opportunities. Furthermore, it helps to identify existing pain points. A business model analysis can result in

the decision to focus only on a small part of the model (such as the customer channels), or to transform the complete business model (change the value proposition). Typically, the business model analysis also helps to identify current pain points or potential new customer relations. The business model canvas or business model navigator are the tools most often used for the analysis. As an add-on to the business model analysis, a stakeholder analysis is important for medium-sized companies for identification of drivers and showstoppers in a digitalization process.

6.3.2.4 Market & competitors analysis (required)

A market and competitor analysis can be done in the “traditional” way, using Porter’s five forces, a PESTLE-Analysis or other established tools. Moreover, though, the market analysis needs to cover shifting market opportunities, thus focusing more on yet undiscovered markets or customer segments. A market analysis must include an evaluation of future market opportunities, or new market segments that can be reached through digital channels. Here, tools used in innovation processes help identifying opportunities.

6.3.2.5 Optional: Resource evaluation

The identification of existing internal resources is particularly relevant in medium-sized companies, where not all resources might be known. This involves potentially relevant assets such as data sources, but also internal know-how of employees. In both small and medium companies, part of the evaluation should be directed towards the determination of relevant skills that need to be developed (or hired), as well as the motivation to support digitalization initiatives.

6.3.2.6 Optional: IT Landscape

The existing IT-landscape and IT-systems need to be determined in regard to future expansion and compatibility. This is particularly important where legacy systems (such as an ERP system, or production system) need to be taken into account for a future planning. One of the relevant parts of an assessment of the IT landscape includes the assessment of security and legal constraints.

6.3.2.7 Optional: Value Chain/Actors/Ecosystem analysis

The value chain analysis focuses on the identification of existing problems within the

company value chain (using Porter’s value chain model) and the possible changes through digitalization. Often, this is the starting point for process optimization. Furthermore, it helps to identify digitalization potential in all areas of a company. The ecosystem analysis offers further insights for digitalization across companies and opportunities for platform usage. In the ecosystem analysis, players outside the company, the value chains of suppliers, partners and customers are included in the analysis. Data and information as key value chain driver play a crucial role in the analysis. A stakeholder analysis is relevant for both the strategy process and the implementation process.

6.3.3 Elements of the definition phase (“Digital Ambition”)

6.3.3.1 Opportunities & Positioning

As a result of the analysis-phase, new business opportunities can be identified. The opportunities can be evaluated according to potential growth and uniqueness of value proposition for the specific company. At the same time, the positioning within the opportunities need to be defined according to risk and resource. Another aspect that is relevant for many companies in regard to future positioning is the branding. A helpful tool for positioning is the extend and speed of potential disruption of an industry.

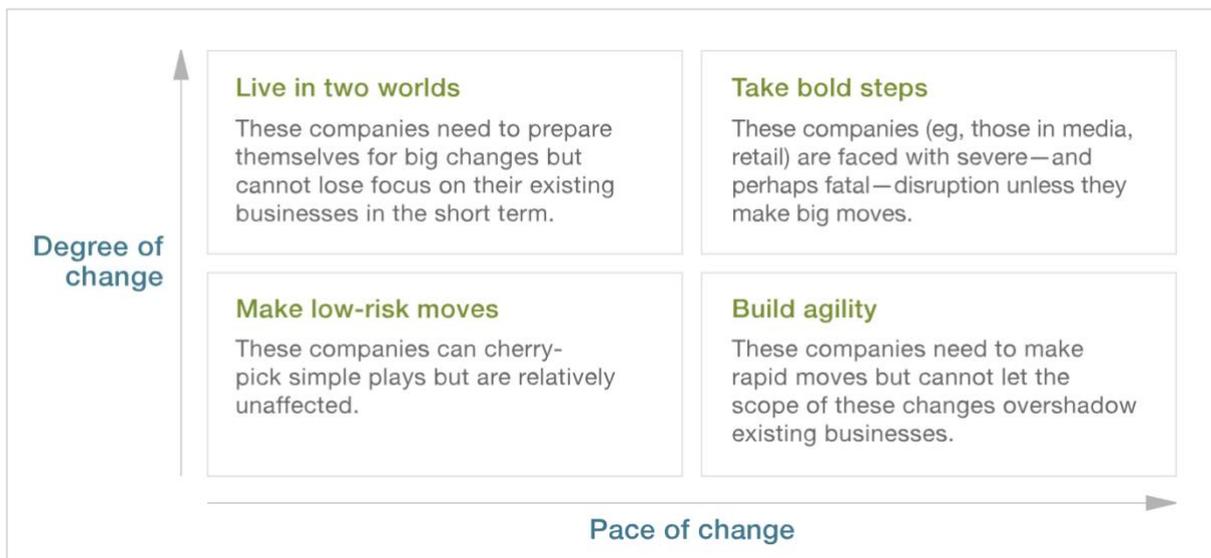


Figure 19: Degree and pace of change matrix from McKinsey (Bughin, Catlin, Hirt, & Willmott, 2018)

6.3.3.2 Vision and Goals with KPIs

A vision for the digital future of a company is not a necessity if a business vision exists. However, more often than not, developing a future vision that lies, ideally, 5-10 years ahead

needs to be part of the digitalization strategy for creating the necessary long view ahead. That vision serves as both an inspiration and a sense of what needs to be done. It is particularly relevant in a rapidly changing environment, where it serves as guiding light, while the process of getting there is subject of change and agility. Clearly defined goals are a must for a reliable strategy. KPIs should be included, though in practice, they are often neglected. A balanced scorecard approach for creating KPIs helps in not only defining financial goals.

6.3.3.3 Business Model changes

Business model changes are at the very heart of strategy development. It means the redefinition of the customer segments and customer relations, the value proposition, the relevant processes and activities, and the revenue streams based on digital changes. In the course of digitalization, SMEs generally transform only parts of the business model rather than creating a completely new model. All dimensions of the future business model need to be taken under consideration, even if only parts are changed, to lay out the interdependencies. Depending upon the vision and goals, the appropriate changes have to be defined. While most SMEs change or enhance the existing business model, the creation of completely new business models based on opportunities created by digitalization might lead to a business model portfolio.

6.3.3.4 Operating Model changes (Structure and processes)

The business model changes require changes in the operational structure of a company. Typically, this involves existing structures and processes. The required changes might include the existing organization and hierarchies that otherwise would not allow for a business model change. For digital initiatives to work, new teams need to be created to ensure an implementation across existing internal “boundaries”. New software and product development methods such as scrum and might need to be introduced to allow an agile working. Often, the existing processes need to be changed as a result of digitalization. These changes need to be defined in the digital ambition phase.

6.3.3.5 Optional: Scenario Development

Future scenario development helps in getting a clear picture of the expected future and a positioning of the own company. It helps in creating a vision that is rooted in a vivid

representation. Scenarios are also used to create a common understanding of the future direction. They can also be of help in assessing the relevant parameters for business model changes.

6.3.3.6 *Optional: Best Practice*

One of the key factors for SMEs is to see best practices as examples for inspiration. This could be on a business model level, or any of the six dimensions for digitalization. Best practices are an excellent method for the identification of opportunities or potential areas of digitalization success. They are relevant in both the analysis and the definition phase.

6.3.4 Elements of the planning phase (“Digital Roadmap”)

6.3.4.1 *Project definition and prioritizing*

The core part to get from strategy to action is to define projects and initiatives along the six dimensions. The definitions need to include at least a title, goal and short description. Furthermore, an estimation of resources (both in terms of time and money), dependencies and technological basis (where applicable) should be included. The prioritization of the projects needs to happen along defined categories such as strategic fit, expected customer benefit, and internal complexity. The prioritization needs the attendance of the management, since competing interests need to be levelled out. Quick-wins can be identified or defined in this process. They are of major importance for creating motivation through first success projects. Not all digitalization measures can be defined as projects with a defined start, ending and scoping. Therefore, initiatives are part of the roadmap. They include topics that cannot be specified specifically at the moment of the project definition. An example is the increase of digital know-how through the attendance of conferences.

6.3.4.2 *Timeline*

The timeline depicts the identified and projects and initiatives for the upcoming years. Generally, the timeline includes projects for three years, with the first six months shown in more detail. Dependencies and milestones are part of the timeline. Typically, the projects are grouped along the dimensions. The timeline is the core part of the third phase. The result itself is usually called “roadmap”. One of the key features of the timeline is the visualization of the length of a project in accordance with the expected resources available.

6.3.4.3 *Definition of Responsibilities (who, when, what)*

Without a clear definition of responsibilities, the chances of implementation of a digital roadmap fall short. They are an important part in terms of commitment, since the definition of responsibilities always needs to include the responsible person. The when and what, which are partly defined in the project definition, need to be clarified with the person in charge.

6.3.4.4 *Culture and Communication*

Digital strategy implementation requires change. One of the most important aspects to actively drive the projects is the communication of upcoming changes, and the creation of the respective culture. Since communication plays a crucial role, it needs to be part of the planning. This might include the interpersonal communication such as team-meetings, or the implementation of team-communication tools. A company culture that supports digitalization is the foundation for successful implementation. Creating a culture that allows changes and fosters teamwork needs to be part of the implementation plan – this involves change management practices.

6.3.4.5 *Optional: Prototyping*

Prototyping of products, services or processes helps for an understanding of the desired goal. In particular with projects related with customer experience (or partner experience), prototyping shortens the decision making and alignment process. This is the element where selected customers can be included in the strategy process.

6.3.4.6 *Optional: Project description*

Project descriptions are more detailed than project definitions. They include various steps within a project, the risks and scoping, as well as more detailed analysis of the required resources and budget. Project descriptions are a typical part of project management. Project descriptions are in particular relevant for more IT/data related projects

6.3.4.7 *Optional: IT Landscape/IT specification*

The IT landscape is a functional overview of the different IT systems and interactions. The future IT landscape helps to understand the IT requirements and dependencies. Often, this involves a definition of a “two-speed architecture” (Bossert, 2016), with existing legacy

systems that are slow to change, and a customer-oriented technology that needs to be modular and flexible. In larger companies, a high-level IT specification often accompanies the digital strategy, defining the relevant parameters for the implementation process.

6.4 Dimensions of the digital strategy framework

The main challenging in the definition of dimensions to find a balance between too many and too few. Two dimensions that were almost always included in existing frameworks are purposefully not part of this one: business model and leadership. The dimension “Business Model” is an explicit element of the first two phases and as such part of the process. After a strategic decision has been taken, the planning does not involve business modelling as such, but rather the changes in the other dimensions that are affected by the business model. The planning is already based on the business model change. Leadership and culture are both subsumed under people & know-how. First, because cultural change and leadership are difficult to be included on an operational level; second, because the element “culture and communication” in the planning phase already sets an early focus on this aspect. The result are six dimension that are broad enough to cover all aspects of digitalization.

6.4.1 Customer Experience & Customer Relations

The dimensions include all activities that directly affect the interaction with the customers. It includes e-commerce and partner portals. Projects that typically fall in this dimension are all activities regarding online services and online communication, but also the personalization of customer data or CRM related activities. Furthermore, online marketing activities and the use of social media are included.

6.4.2 Products & Services

As part of a change in the business model, existing products and services are digitally enhanced, or completely new products & services are developed. In this dimension, new or enhanced products are included. This could include purely digital products such as online services, or data products. It could also mean the integration of data into existing products for automatic maintenance. Often, it includes the product/service roll-out in new markets.

6.4.3 Processes

The digitalization of existing processes is likely to be one of the starting points of

digitalization. This includes the automation of existing processes, the establishment of new processes that are fully digitized, or the optimization of processes to enhance the value creation. Industry 4.0 related projects are highly related to process automation and process efficiency. But not only in the manufacturing, also in other industries, process enhancement along the complete value chain are highly effected by digitalization. A change or enhancement in sales and marketing channels is often accompanied by new internal processes.

6.4.4 Structure & Organization

In this dimension, the strategic definitions regarding the future structure and organization are operationalized. Often, this will be initiatives rather than projects. Often, it will include internal changes in team structure and workflows. Often, new organizational structures require digital forms of organization. Projects that relate to this category might include the introduction of team working software, or the cooperation with startups. Often, the integration of value chains of partners brings the necessity of new organization structures. To cope with the transparency and speed that digitalization requires, many companies also need to address the topic of agility and decentralized decision-making to successfully transform.

6.4.5 People & Know-How

The dimension people & know-how comprises all relevant projects and initiatives in relation to the skills, motivation and mind-set of management and employees. Leadership is included in this dimension: initiatives the involve leadership skills or a change in leadership culture within a company. Since know-how is one of the most relevant aspects for most SMEs, this dimension includes the core initiatives that define how the relevant know-how can be established and acquired. Typically, this involves HR-activities, but also new internal learning initiatives. In this dimension, change-related projects will take place. These are the initiatives that are of highest importance for a successful integration of a strategy.

6.4.6 IT & Technology

The dimension IT & technology includes core projects and decisions for the digitalization of a company. It does include projects related to new digital technologies, such as the use or implementation of technological platforms, sensors and robotics. In particular data & cloud

usage are also integrated in this dimension. Typically, projects related to ERP, CRM and other central management tools are addressed. Finding a technological infrastructure and using cloud services are equally projects of the IT/technology dimension. This dimension forms the base layer for the digitalization of a company. It represents a higher level of the IT-strategy; in smaller SMEs, it includes the IT strategy.

6.5 Relevant parameters

6.5.1 Time-Frame

The time frame for the strategy process is given as a two to three months period. This is enough time for research and reflection but will still keep the drive and understanding in the process. Furthermore, since a re-evaluation of the strategy is part of the concept, any variables not being evaluated will be addressed in the next cycle. If the optional elements are also included in the strategy process, the time-frame needs to be widened to 5 months.

6.5.2 Participants

The team should include influencers and stakeholders from various areas of a company. Management needs to be included in as many workshops as possible – and if not directly included, needs to be part of the strategy process. A diverse team is essential for the strategy process, with a workshop team-size is typically around 5-8 people. To get a rapid involvement of as many employees as possible, participants of the strategy process should be used as “transformation agents”. Furthermore, the involvement of a high number of employees can be assured by using methodologies involving a large amount of them into the strategy process itself.

6.5.3 Artefacts/results

The final result of the strategy process is a visual representation that is easily understandable. Typically, this is a large poster including vision and goals, the roadmap with responsibilities, and ideally some future scenario or prototyping. A potential further artefact is the future business model in canvas form. A communication plan needs to be set up in order to define how the digitalization transformation is actively promoted internally. The key point regarding the artefacts is that they can be understood easily and reviewed easily.

- 1) Roadmap with milestones, projects and initiatives along the most relevant

dimensions, and dependencies, including responsibilities

- 2) Vision and Goal with KPIs in short/visual format
- 3) Communication plan, which communication channels, transformation agents, feedback channels, and communication rollout

Further optional artefacts that are of relevance

- 4) Business model canvas
- 5) A story as a help for change
- 6) Prototypes

6.5.4 Strategy Loop

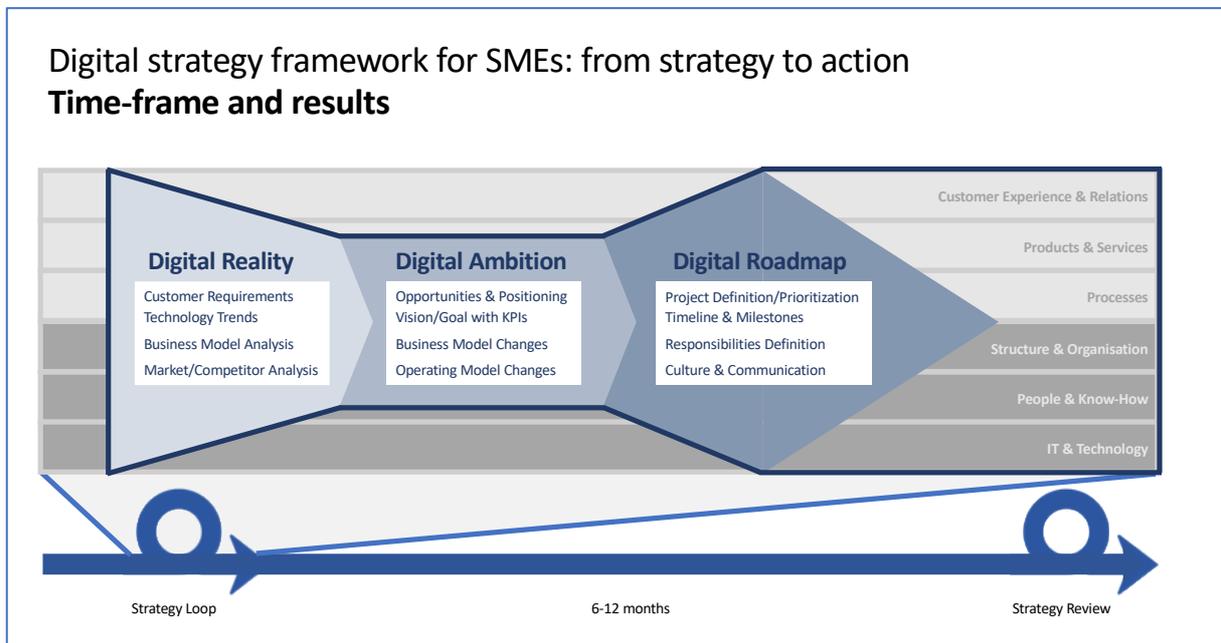


Figure 20: Digital Strategy Framework: Strategy Loop

Since the parameters that influence the strategy are rapidly changing, the digital strategy needs to be reviewed on a regular basis. The review includes two areas: first, the classical controlling of milestones and projects; second, and more importantly, the review needs to examine the external and internal factors that drive the strategy. Markets and competitors can quickly change in the digital environment: new technologies might have come to the market that influence the projects; or a rapid reaction to new customer behavior needs to be integrated. The strategy review can be short but should be scheduled ahead to confirm its relevance for the digital strategy process.

6.5.5 Success parameters

The most important success parameter is the creation of a mindset that is open towards digitalization and change. Therefore, both leadership and communication need to be in line with the strategy process and execution – something that is often labeled “leadership by example”. One of the means of achieving that is the inclusion of employees in parts of the strategy process; another one is the creation of artefacts that are visual and easily understandable. A third important factor is the creation of an internal communication (through digital channels and through advocates) that keeps the information and motivation high throughout the strategy and implementation process. Updates on initiatives and projects need to be communicated through these channels on a regular basis. Furthermore, for active engagement, feedback channels need to be installed.

7. Validation of the framework

To identify the usefulness of the digital strategy framework for the relevant target group, the framework was presented to four selected interviewees that hold relevant positions in SMEs.

7.1 Interviews with SMEs

The interviewees were selected from existing relations of second grade (not personally known, except # 4) holding relevant positions in SMEs. The companies were of various sizes and industries, but all were in charge of the digital agenda of their company.

| Expert | Name and function | Business area and company size |
|--------|---|--|
| 1 | Thomas Berner, Head of Communications of Tilo GmbH | B2B, production (floor panels), 250 employees |
| 2 | Christa Gätz, Owner of Alco GmbH | B2B, production and retail (wintergarden), 18 employees |
| 3 | Ines Riener, Head of Marketing of Tisca Textil GmbH | B2B and B2C (through digitalization), production, 80 employees |
| 4 | Helmuth Zechner, Owner of Buchhandlung Heyn | B2C retail (bookstore), 40 employees |

Table 12: List of interviewees for framework validation

The telephone/video-interviews were held in June 2018 and lasted for around 20 minutes.

The visualization of the framework was presented and explained along the four figures presented in the previous chapter (Figure 16, Figure 17, Figure 18, Figure 20).

The questions were asked in regard to the practical use of the framework:

- 1) Is the framework understandable?
- 2) Are you missing elements in the framework?
- 3) Do you see the dimensions as relevant?
- 4) What is of particular importance for you in a digital strategy process?
- 5) What do you want to have as the result of a digital strategy process?

7.2 Findings

Finding 1: The three steps of the process are understandable and do make sense. The wording was easily understandable for all interviewees. In particular, “Digital Ambition” was liked by the interviewees, since it implies an active choosing of the positioning. The word

“roadmap”, though an English term, is understood and known in German. Also, the descriptions of the three steps or phases were clear.

Finding 2: The strategy loop was understood and appreciated. Nevertheless, the visual representation is not optimal. In particular, the typical elements of an implementation process (controlling, benchmarking, review) were missed as description by interviewee 1. The time period given in the strategy loop picture was confusing in relation to the earlier timeline for the process itself.

Finding 3: The elements for each phase are clear and understandable. Interviewee 3 could relate the elements to a recent process in her existing company. The elements were not seen as too exhaustive. Including four elements in each phase helps to show a coherency of the process.

Finding 4: The distinction between required and optional element was perceived as helpful, since the optional elements could be presented “on request”, but many of them were not perceived as highly important. In particular, the relevancy of a digital maturity assessment was not seen by all interviewees.

Finding 5: Setting a time-frame in the framework results in ambiguous reactions: The suggested time-frame of 2-4 weeks for each process phase was questioned by three interviewees in relation to internal processes and resources; for interviewee 2 (the smallest company), the short time-frame brought more transparency to the process.

Finding 6: The dimensions are clearly understandable and are seen to be encompassing. The interviewees also saw them as helpful in identifying interdependencies among different areas. One suggestion that was made was to group the dimension differently in two customer related dimensions (products & services, customer experience), two operational dimensions (processes, IT) and the “human” dimension (organization, culture).

Finding 7: The most relevant factor regarding digitalization that was seen by all interviewees was the motivation of people: “How many of the employees will want to change anything?” is the most important question, and it implies that digital initiatives have to be “*balanced against the human factor*”, as one interviewee put it. Therefore, the focus on the definition of the communication measures in the final phase is highly important.

Finding 8: The final results of the strategy process need to serve as a guideline. The idea of a

visual roadmap as result is welcome as opposed to a written document, but hard to imagine. As one interviewee put it: *“It would be helpful to see what the result looks like, or examples”* (Int. 2). In order to make the framework as understandable as possible, examples or visual representations of potential results should be added.

7.3 Suggestions for improvements

The interviewees gave suggestions to improve the understanding:

- a) to have an outline of the artefacts/results of the first two phases, and not only of the third phase (as an example, a SWOT Analysis as the result of the first phase was mentioned by one interviewee)
- b) to show examples of the results of a digital strategy, to enhance the understanding of the practicability
- c) to include the resources needed from the company (how many workshops, how much time, and which people involved)
- d) to include a process map as a possible additional element

7.4 Integration in results

Even though the number and selection of the interviewees for a validation of the framework are not representative, the findings suggest that the framework is valid, understandable and useful for SMEs. However, the time-frame suggested needs to be revised: instead of 6-12 weeks, it should be 2-6 months. Furthermore, both the visualization and the description of the strategy loop can be enhanced to make it more understandable in relation to the strategy process itself.

The main suggestions for improvement do not concern the framework as such, but rather the description of the procedure and results. The conclusion is that SMEs want to see a procedure model rather than a framework, because it gives them a better understanding and guidance. For the framework, this means to include the results of every process step into the process-description, similar to Framework B discussed in 4.3. Since the results will vary for every company, a projection of the most relevant artefacts could help. The revised version of the framework contains a description of some results for each phase, and a time-frame of 3-6 months.

The revised versions of the framework, taking up on the suggestions, are presented in the following two figures. They show the digital strategy framework with a revised time-frame, including visual icons for the most relevant results of each phase.

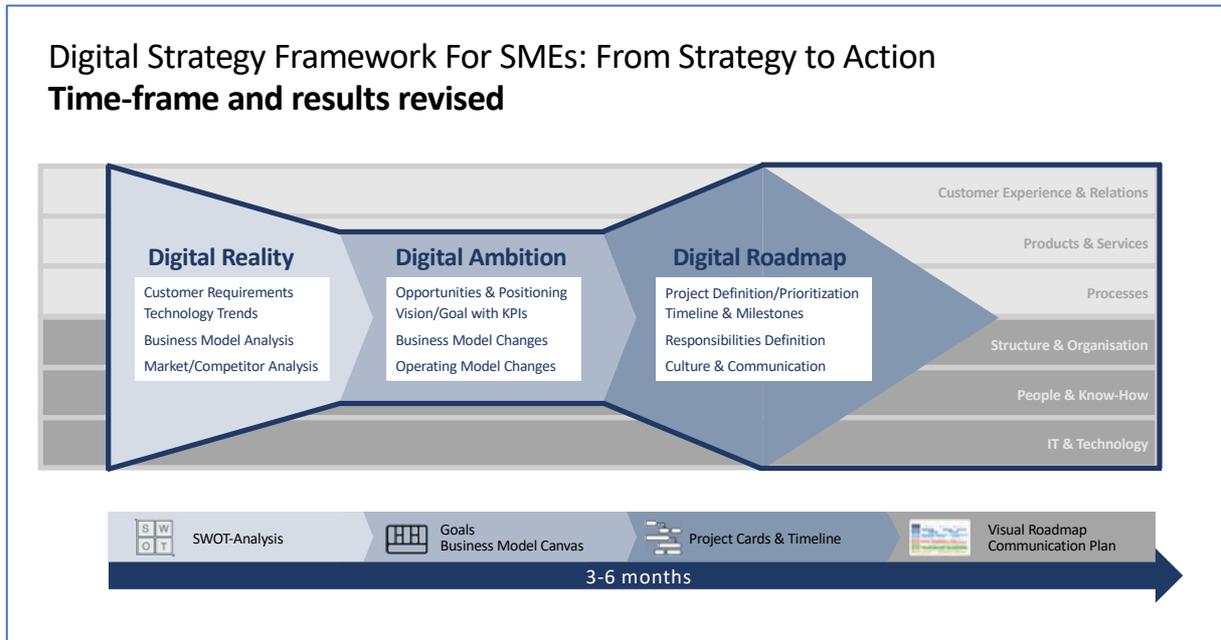


Figure 21: Digital strategy framework for SMEs with revised time-frame and results

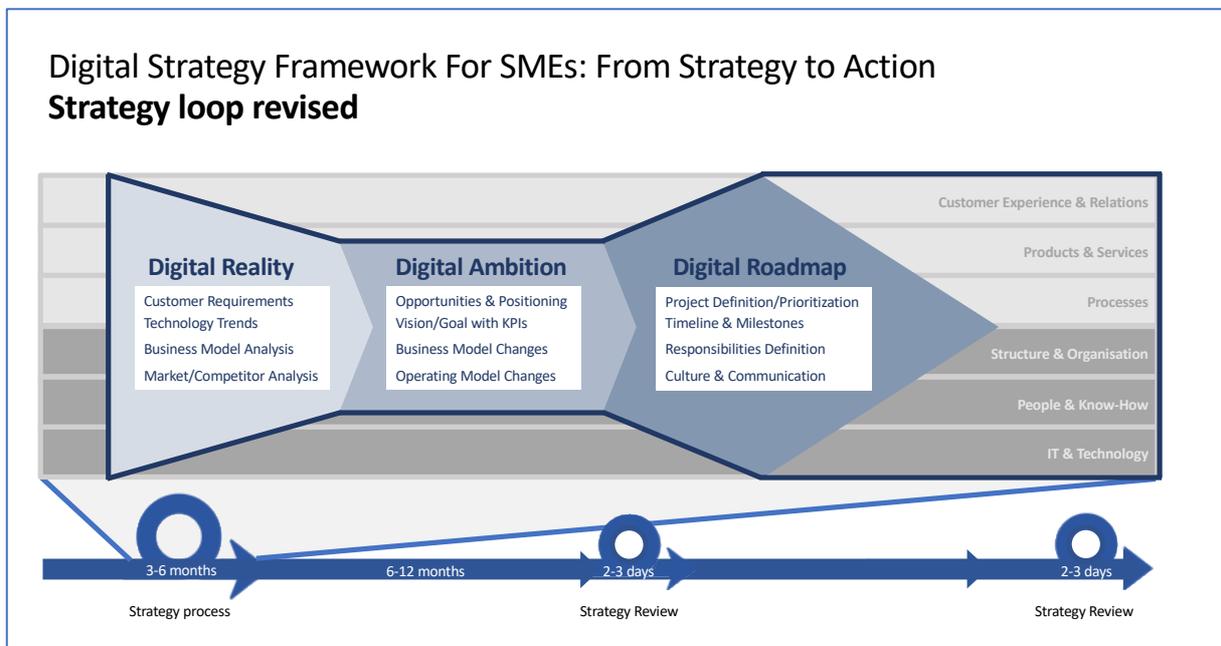


Figure 22: Digital strategy framework for SMEs with revised strategy loop

8. Discussion and Conclusion

8.1 Summary and findings

The principal goal of this thesis was to develop a strategy framework for SMEs to help them with the challenges of digitalization. The digital strategy framework that is presented in chapter 6 provides a practical, instantly usable guideline for SMEs of different areas of business. Its usefulness has been confirmed by interviews with SMEs.

In order to fulfill the claim "From Strategy to Action" three process steps – Digital Reality, Ambition, Roadmap – have been identified. Each is divided in four key elements to ensure a coherent fulfillment. The process, in particular within the final phase, helps to develop the digitalization projects and initiatives along six carefully selected and evaluated dimensions to fully embrace the organizational changes. The focus of the framework is to deliver a plan for implementation at the end, which provides SMEs a comprehensive overview and controls along the way. The framework differs from existing ones in its focus on delivery.

Three insights in particular resulted from the analysis and development of digital strategy framework:

- 1) A framework for digital strategy is not different for SMEs and for large companies. While the time-frame, the people involved, and the scoping might differ, the overall process and the included elements, and most of the dimensions, are the same.
- 2) SMEs need a procedure model rather than a framework: If the individual steps are defined in detail, SMEs will be more likely to spend time and money on strategy developments. In particular, the results need to be defined to help SMEs to cope with the uncertainty and perceived risk. Instead of focusing on encompassing all potential aspects of digital transformation, the guidance through the specific steps is important. A combination of the framework with “playbooks” that present methods and tools is of great practical help for SMEs.
- 3) Digitalization and digital transformation are processes. It helps SMEs to start in a particular area (such as process optimization) and set a focus. Still, the overall picture should be established. The digital strategy framework allows this path by only choosing one or two dimensions for the actual roadmap phase.

The digital strategy framework was developed by doing research on existing approaches and matching them with insights from the daily practice: The literature research (chapter 2) showed that digitalization and digital transformation are both used interchangeably to describe the enhancement or change of existing business activities with digital technologies. The discussion about the amount of change that should be aspired by SMEs is ongoing. While consultants and scholars see business model innovation as an inherent part of digital transformation, most companies have a clear focus on increasing the efficiency of processes, accessing new customer groups and enhancing the loyalty of existing customer groups, thus pursuing incremental rather than disruptive changes. This was underlined by the evaluation of surveys in the DACH-region regarding the status of digital transformation in SMEs (chapter 3). Many SMEs set the focus on individual projects rather than pursuing a strategy that combines various efforts towards digitalization – due to a lack of resources (in finance, time, and people). The analysis of existing frameworks in chapter 4 has shown that there is high agreement for the first phase of the digital strategy development, while the end of the process is often not clearly defined. A set of relevant elements and dimensions for a framework was identified. These were evaluated in eight expert interviews in chapter 5. As a result, the digital strategy framework for SMEs was developed in chapter 6 – including the focus on project definitions and required results of the final phase. The framework was evaluated by four SMEs in chapter 7, resulting in a confirmation of its understandability and usefulness, and a modification regarding the time-frame.

8.2 Contribution of Research

Many digitalization initiatives fail. Regardless of the amount and deepness of digitalization, the complexity of the new technology and the challenges and chances they bring to companies need a coordinated approach. The digital strategy framework developed in this thesis is a means to help SMEs on their road to digitalization.

In the last years, digital strategy frameworks have been developed mainly by consulting agencies – as a means of coping with the challenges of their customers. Scientific research about the validity and helpfulness of the frameworks is still in its early stages. The thesis has developed an approach for the analysis of such frameworks, using process, elements and dimensions as a systematic way to look at similarities and unique features. Using several process models, the thesis has shown that three steps are sufficient for a strategy process.

Furthermore, of the many potential elements that can be included in the process, the most relevant ones could be identified for each phase. Business model analysis and change has been established as one of the core elements for the strategy process – but, contrary to many existing frameworks – not for the later phase or as a separate dimension. Digitalization is a multidimensional process. The six dimensions identified for the alignment of digitalization initiatives bring transparency to the process, and more clarity in the definition of process elements and “content” elements.

The approach used in this thesis has shown incoherence among existing frameworks regarding the actual scope and results of a digital strategy. One of the major findings was the need for a clearly defined end of a strategy process. The implementation is not part of the strategy process. What is of utmost importance, though, is the definition of results. The framework includes the definition of the results: a digital roadmap and a communication plan.

8.3 Limitations and further exploration

The interviews used as an input for the development of the strategy framework were helpful, but of course limited due to the sample size. Interviewing more experts would bring additional insights. Furthermore, in the sense of an open innovative approach, companies that have undergone or are undergoing a digital strategy process should be interviewed, too. The basis for the development of the strategy framework were existing frameworks, and input from practitioners.

To fully embrace digitalization, organizational change needs to be part of the strategy. How can a strategy process reflect an agile organization, or how can agile methodologies such as scrum be seamlessly integrated into the strategy process? These are questions that will be relevant for further research. New concepts on how to look at strategy were not in the focus of this research but offer promising insights and maybe even changes in how we develop a strategy framework. One of the relevant research topics in this area concerns the changes in terms of strategy model – from strategy as a plan to strategy as a pattern with incremental learnings and incremental strategy processes (Kreutzer, Neugebauer, & Pattloch, 2017). Other approaches look at strategy as a pattern with incremental learnings and an incremental strategy process and a continuous alignment: *“In conclusion, as organizations*

increasingly shift towards digital strategy, the need to understand how aligning unfolds across multiple transfunctional processes becomes more critical and can potentially be a source of competitive advantage” (Yeow, Soh, & Hansen, 2018, p 57).

The validity of a framework can only be tested when it is applied in real life. The interviews with SMEs have shown that the framework is both easy to understand and helpful in the explanation of the necessary steps and dimensions to considerate. In the future, the digital strategy framework will be applied for several strategy developments to get further insights. A combination of the framework with “playbooks” that focus on the actual methods (such as the digital innovation playbook (Bartl, 2016)). A great potential lies in the application of the framework by various consultants that focus on SMEs.

9. Bibliography

- Adlmaier-Herbst, D. G., & Schildhauer, T. (2017). Digitale Transformation in KMU. *KMU Magazin*. Retrieved from <https://www.kmu-magazin.ch/digitalisierung-transformation/die-bausteine-der-digitalen-transformation>
- Amit, R., & Zott, C. (2001). Value creation in E-business. *Strategic Management Journal*, 22(6–7), 493–520. <https://doi.org/10.1002/smj.187>
- Arthur D. Little. (2017). *Digitale Transformation von KMUs in Österreich - 2017. Erhebung des Digitalisierungsstatus*. Retrieved from <https://www.wko.at/branchen/information consulting/unternehmensberatung-buchhaltung-informationstechnologie/digitale-transformation-kmu.pdf>
- Bain & Company. (n.d.). Radar 360 / Digital Transformation Consulting. Retrieved May 17, 2018, from <http://www.bain.com/consulting-services/digital/digital-transformation.aspx>
- Bartl, D. (2016). *Digital Innovation Playbook: das unverzichtbare Arbeitsbuch für Gründer, Macher und Manager ; Taktiken, Strategien, Spielzüge*. Hamburg: Murmann Publishers.
- Becker, W., Ulrich, P., Botzkowski, T., & Eurich, S. (2017). Digitalisierung von Geschäftsmodellen. In *Digitale Transformation von Geschäftsmodellen* (pp. 283–309). Springer Gabler, Wiesbaden. https://doi.org/10.1007/978-3-658-12388-8_11
- Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital Business Strategy: Toward a Next Generation of Insights. *MIS Quarterly*, 37(2), 471–482. <https://doi.org/10.25300/MISQ/2013/37:2.3>
- Bossert, O. (2016). A Two-Speed Architecture for the Digital Enterprise. In *Emerging Trends in the Evolution of Service-Oriented and Enterprise Architectures* (pp. 139–150). Springer, Cham. https://doi.org/10.1007/978-3-319-40564-3_8
- Boston Consulting Group. (n.d.). BCG Digitization Strategy Framework. Retrieved May 11, 2018, from <https://www.bcg.com/de-de/capabilities/technology-digital/digitalization-strategy-framework.aspx>
- Bughin, J., Catlin, T., Hirt, M., & Willmott, P. (2018, January). Why digital strategies fail | McKinsey & Company. Retrieved March 11, 2018, from <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/why-digital-strategies-fail>
- Büst, R., Hille, M., & Schestakow, J. (2015). *Digital Business Readiness. Wie deutsche Unternehmen die digitale Transformation angehen*. Crisp Research. Retrieved from <https://www.dimensiondata.com/de-DE/Downloadable%20Documents/Digital%20Business%20Readiness%20Crisp%20Research%20Article.pdf>
- CapGemini Consulting. (2011). *Digital Transformation. A Roadmap for Billion Dollar Organisations*. CapGemini & MIT Sloan Management School. Retrieved from <https://www.capgemini.com/consulting/service/digital-transformation/>
- Christensen, C. M. (2013). *The innovator's dilemma: when new technologies cause great firms to fail* ([Reprint.]). Boston, Mass: Harvard Business Review Press.
- Christensen, C. M. (2016). *Competing against luck: the story of innovation and customer choice*. (1st edition). New York, NY: Harper Collins.
- Cognizant (Ed.). (2014). A framework for digital business transformation. Retrieved from <https://www.cognizant.com/InsightsWhitepapers/a-framework-for-digital-business-transformation-codex-1048.pdf>
- Commission of the European Communities. (2013, May 6). Commission Recommendation concerning the definition of micro, small and medium-sized enterprises (2003/361/EC). Retrieved from <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003H0361&from=EN>
- Dahlström, P., Desmet, D., & Singer, M. (2017, February). The seven decisions that matter in a digital transformation: A CEO's guide to reinvention | McKinsey & Company. Retrieved March 20, 2018, from

- <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-seven-decisions-that-matter-in-a-digital-transformation>
- Dawson, A., Hirt, M., & Scanlan, J. (n.d.). The economic essentials of digital strategy | McKinsey & Company. Retrieved March 11, 2018, from <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-economic-essentials-of-digital-strategy>
- Deloitte. (2013). Digitalisierung im Mittelstand. Deloitte. Retrieved from <http://www.forschungsnetzwerk.at/downloadpub/Digitalisierung-im-Mittelstand.pdf>
- Desmet, D., Duncan, E., Scanlan, J., & Singer, M. (2015, September). Six building blocks for creating a high-performing digital enterprise | McKinsey & Company. Retrieved May 15, 2018, from <https://www.mckinsey.com/business-functions/organization/our-insights/six-building-blocks-for-creating-a-high-performing-digital-enterprise>
- Ernst & Young. (2018). Digitaler Wandel in österreichischen Mittelstandsunternehmen. Retrieved from [http://www.ey.com/Publication/vwLUAssets/EY-Studie_%E2%80%9EDigitaler_Wandel_im_Mittelstand%E2%80%9C_-_M%C3%A4rz_2018/\\$FILE/EY%20Digitalisierungsstudie%20Oesterreich%202018.pdf](http://www.ey.com/Publication/vwLUAssets/EY-Studie_%E2%80%9EDigitaler_Wandel_im_Mittelstand%E2%80%9C_-_M%C3%A4rz_2018/$FILE/EY%20Digitalisierungsstudie%20Oesterreich%202018.pdf)
- Esser, M. R. (2014). Chancen und Herausforderungen durch digitale Transformation. Retrieved May 17, 2018, from <http://www.strategy-transformation.com/digitale-transformation-verstehen/>
- Esser, M. R. (2017). Digital Maturity Assessment (DMA). Retrieved May 7, 2018, from <http://www.strategy-transformation.com/digital-maturity-assessment/>
- etVenture + GfK. (2018). Studie Digitale Transformation 2018: Hemmnisse, Fortschritte, Perspektiven. Retrieved from <https://service.etventure.de/digitale-transformation-2018>
- European Commission. (2017). *Digital Transformation Scoreboard 2017*. European Commission. Retrieved from <https://ec.europa.eu/docsroom/documents/21501?locale=en>
- FHS St. Gallen (Ed.). (2017). *KMU-Spiegel 2017. Digitalisierung in Schweizer Klein- und Mittelunternehmen*. FHS St. Gallen. Retrieved from [https://www.fhsg.ch/fhs.nsf/files/IFU_KMU-Spiegel_2017%20deutsch/\\$FILE/FHS_KMU_Spiegel_2017_DE.pdf](https://www.fhsg.ch/fhs.nsf/files/IFU_KMU-Spiegel_2017%20deutsch/$FILE/FHS_KMU_Spiegel_2017_DE.pdf)
- Gartner. (n.d.). IT Glossary. Retrieved May 7, 2018, from <https://www.gartner.com/it-glossary/digitalization/>
- Gassmann, O. (2016). *Digitale Transformation im Unternehmen gestalten: Geschäftsmodelle, Erfolgsfaktoren, Handlungsanweisungen, Fallstudien*. München: Hanser.
- Gassmann, O., Frankenberger, K., & Csik, M. (2017). *Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator (2., überarbeitete und erweiterte Auflage)*. München: Hanser.
- Horváth & Partners. (2018, March). Digital Value 2018 - der Beitrag der Digitalisierung zur Wertschöpfung. Retrieved March 21, 2018, from <https://www.horvath-partners.com/de/media-center/studien/detail/digital-value-2018/>
- IfM Bonn: KMU-Definition des IfM Bonn. (n.d.). Retrieved March 11, 2018, from <https://www.ifm-bonn.org/definitionen/kmu-definition-des-ifm-bonn/>
- Institut f. Wirtschaftsinformatik. (2017). *Digital Maturity & Transformation Report 2017*. St. Gallen: Institut f. Wirtschaftsinformatik, Universität St. Gallen.
- Institute for Digital Business der HWZ (Ed.). (2017). *digitalswitzerland*. Retrieved from <https://www.digitalswitzerland.ch>
- Ismail, M. H., Khater, M., & Zaki, M. (2017). Digital Business Transformation and Strategy: What Do We Know So Far? *University of Cambridge*, 36. Retrieved from https://cambridgeservicealliance.eng.cam.ac.uk/resources/Downloads/Monthly%20Papers/2017NovPaper_Mariam.pdf
- Jodlbauer, H., & Schagerl, M. (2016). *Reifegradmodell Industrie 4.0 - Ein Vorgehensmodell zur Identifikation von Industrie 4.0 Potentialen*. Gesellschaft für Informatik e.V. Retrieved from <http://dl.gi.de/handle/20.500.12116/1035>

- Kane, G. C., Palmer, D., Nguyen-Phillips, A., Kiron, D., & Buckley, N. (2017). Achieving Digital Maturity. *MIT Sloan Management Review; Cambridge*, 59(1), n/a-0. Retrieved from <https://search.proquest.com/docview/1950392650/abstract/177C00BC74984333PQ/56>
- Katz, R. L., & Koutroumpis, P. (2012). Measuring socio-economic digitization: A paradigm shift. *SSRN*, 31. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2070035
- Kienbaum Consultants. (2017). *Die richtige Organisation zur Digitalen Transformation. Eine bayme vbm Studie.* (p. 35). Kienbaum für bayme vbm.
- Kreutzer, R. T. (2017). Treiber und Hintergründe der digitalen Transformation. In *Digitale Transformation von Geschäftsmodellen* (pp. 33–58). Springer Gabler, Wiesbaden. https://doi.org/10.1007/978-3-658-12388-8_2
- Kreutzer, R. T., Neugebauer, T., & Pattloch, A. (2017). Acht Handlungsfelder zum Aufbau einer Digital Business Leadership. In *Digital Business Leadership* (pp. 43–212). Springer Gabler, Wiesbaden. https://doi.org/10.1007/978-3-658-11914-0_2
- Lancry, O., Morrissey, R., Shannon, T., Bankert, A., & Cummings, L. (2017, February 8). Digital Strategy for a B2B World. Retrieved May 17, 2018, from <http://www.bain.com/publications/articles/digital-strategy-for-a-b2b-world.aspx>
- Leyh, C., & Bley, K. (2016). Digitalisierung: Chance oder Risiko für den deutschen Mittelstand? – Eine Studie ausgewählter Unternehmen. *HMD Praxis der Wirtschaftsinformatik*, 53(1), 29–41. <https://doi.org/10.1365/s40702-015-0197-2>
- LIMAK (Ed.). (2017). Digital Economy-LIMAK Inspire Digital Studie. Limak - Austrian Business School. Retrieved from https://www.limak.at/wp-content/uploads/2017/12/In-Spire_Paper_DigitalEconomy_01-12-2017-WEB.pdf
- Matt, C., Hess, T., & Benlian, A. (2015). Digital Transformation Strategies. *Business & Information Systems Engineering*, 57, 339–343. <https://doi.org/10.1007/s12599-015-0401-5>
- Matzler, K. (2016). *Digital Disruption: wie Sie Ihr Unternehmen auf das digitale Zeitalter vorbereiten.* München: Verlag Franz Vahlen.
- Mayring, P. (2015). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* (12., überarbeitete Auflage.). Weinheim Basel: Beltz.
- McDonald, M. (2015, March 3). What Is A Digital Strategy? - Accenture. Retrieved June 5, 2018, from <https://www.accenture.com/us-en/blogs/blogs-digital-what-is-digital-strategy>
- McKinsey (Ed.). (2017, February). Die Digitalisierung des deutschen Mittelstandes. Kurzstudie. Retrieved from https://www.mckinsey.de/files/mckinsey_digitalisierung_deutscher_mittelstand.pdf
- Mittelstand Digital. (2016, Dez). Mittelstand im Wandel - Wie ein Unternehmen seinen digitalen Reifegrad ermitteln kann. HBP University Press.
- Mittelstand Digital (Ed.). (2017, January). Meta Analyse Digitalisierung Mittelstand. BSP Business School Berlin GmbH. Retrieved from <https://kommunikation-mittelstand.digital/content/uploads/2017/06/Studie-Metaanalyse-Digitalisierung-Mittelstand.pdf>
- Osterwalder, A., Pigneur, Y., & Clark, T. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers.* Chichester, UNITED STATES: John Wiley & Sons, Incorporated. Retrieved from <http://ebookcentral.proquest.com/lib/wuww/detail.action?docID=581476>
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health*, 42(5), 533–544. <https://doi.org/10.1007/s10488-013-0528-y>
- Patton, Michael Quinn. (1990). *Qualitative evaluation and research methods* (2nd ed.). Beverly Hills, CA: Sage.
- Peter, Marc K. (2017). *KMU-Transformation: Als KMU die Digitale Transformation erfolgreich umsetzen. Forschungsresultate und Praxisleitfaden.* FHNW Hochschule für Wirtschaft. Retrieved from <https://kmu-transformation.ch/>

- Roland Berger, & BDI (Eds.). (2015). Die digitale Transformation der Industrie. Retrieved from https://bdi.eu/media/user_upload/Digitale_Transformation.pdf
- Ruoss, S. (2015). Teil 2: Was wird unter digitaler Transformation genau verstanden? Retrieved May 16, 2018, from <https://svenruoss.ch/2015/06/16/teil-2-was-wird-unter-digitaler-transformation-genau-verstanden/>
- Saam, M., Viète, S., & Schiel, S. (2016). *Digitalisierung im Mittelstand: Status Quo, aktuelle Entwicklungen und Herausforderungen* (p. 113). Zentrum für Europäische Wirtschaftsforschung GmbH.
- Schallmo, D., & Rusnjak, A. (2017). Roadmap zur Digitalen Transformation von Geschäftsmodellen. In *Digitale Transformation von Geschäftsmodellen* (pp. 1–31). Springer Gabler, Wiesbaden. https://doi.org/10.1007/978-3-658-12388-8_1
- Schallmo, D., & Williams, C. A. (2018). *Digital Transformation Now!: Guiding the Successful Digitalization of Your Business Model*. Springer International Publishing. Retrieved from [//www.springer.com/de/book/9783319728438](http://www.springer.com/de/book/9783319728438)
- Schallmo, D., Williams, C. A., & Boardman, L. (2017). Digital Transformation of Business Models - Best Practices, Enablers and Roadmap. *International Journal of Innovation Management*, 21(08), 1740014. <https://doi.org/10.1142/S136391961740014X>
- Solis, B. (Ed.). (n.d.). The six stages of digital transformation maturity by Altimeter Group. Retrieved from <https://www.cognizant.com/whitepapers/the-six-stages-of-digital-transformation-maturity.pdf>
- Unruh, G., & Kiron, David. (2017). Digital Transformation on Purpose. *MIT Sloan Management Review*. Retrieved from <https://sloanreview.mit.edu/article/digital-transformation-on-purpose/>
- Wade, Michael. (2015). *Digital Business Transformation. A Conceptual Framework*. Lausanne: Global Center for Digital Business Transformation. Retrieved from <https://www.imd.org/uupload/IMD.WebSite/DBT/Digital%20Business%20Transformation%20Framework.pdf>
- Werani, T., Schauburger, A., Martinek-Kuchinka, P., & Freiseisen, B. (2017). Wertdisziplinen und digitale Transformation von Geschäftsmodellen. In *Digitale Transformation von Geschäftsmodellen* (pp. 237–263). Springer Gabler, Wiesbaden. https://doi.org/10.1007/978-3-658-12388-8_9
- Wirtschaftskammer Österreich. (2018). *Wirtschaftskraft KMU 2018*. Wien: Wirtschaftskammer Österreich. Retrieved from <https://news.wko.at/news/oesterreich/wirtschaftskraft-kmu2018.pdf>
- Yeow, A., Soh, C., & Hansen, R. (2018). Aligning with new digital strategy: A dynamic capabilities approach. *The Journal of Strategic Information Systems*, 27(1), 43–58. <https://doi.org/10.1016/j.jsis.2017.09.001>

10. Appendix

A. SMEs in Austria: selected statistical data

| Unternehmen und Beschäftigte 2015 | | | | |
|--|--------------------|--------------|-------------------------------|--------------|
| | Unternehmen | | Beschäftigte insgesamt | |
| | Absolut | Anteil in % | Absolut | Anteil in % |
| 0-9 Beschäftigte | 211.892 | 84,8 | 572.353 | 22,1 |
| 10-49 Beschäftigte | 31.790 | 12,7 | 613.649 | 23,7 |
| 50-249 Beschäftigte | 5.131 | 2,1 | 514.193 | 19,9 |
| 0-249 Beschäftigte (KMU) | 248.813 | 99,6 | 1.700.195 | 65,6 |
| 250 und mehr Beschäftigte (GU) | 1.090 | 0,4 | 889.817 | 34,4 |
| Gesamte gewerbliche Wirtschaft | 249.903 | 100,0 | 2.590.012 | 100,0 |

Auf Grund des Erfassungsumfangs der Leistungs- und Strukturstatistik (ÖNACE B-N, S95) kann es zu Untererfassungen einzelner Sparten/Fachverbände in der Auswertung nach der Kammersystematik kommen. Dies betrifft in der Auswertung nach Sparten insbesondere die Bereiche Tourismus und Freizeitwirtschaft sowie Gewerbe und Handwerk.

KMU = Kleine und mittlere Unternehmen
GU = Großunternehmen

Quelle: Statistik Austria

| Output in Mio. Euro 2015 | | | | | | |
|---------------------------------------|---------------------|--------------|--|--------------|----------------------------|--------------|
| | Umsatzerlöse | | Bruttowertschöpfung zu Faktorkosten | | Bruttoinvestitionen | |
| | Absolut | Anteil in % | Absolut | Anteil in % | Absolut | Anteil in % |
| 0-9 Beschäftigte | 95.044 | 14,9 | 25.974 | 15,5 | 3.316 | 12,3 |
| 10-49 Beschäftigte | 131.722 | 20,6 | 34.914 | 20,8 | 5.074 | 18,8 |
| 50-249 Beschäftigte | 174.716 | 27,3 | 38.459 | 22,9 | 8.008 | 29,7 |
| 0-249 Beschäftigte (KMU) | 401.483 | 62,8 | 99.347 | 59,2 | 16.399 | 60,7 |
| 250 und mehr Beschäftigte (GU) | 237.708 | 37,2 | 68.471 | 40,8 | 10.600 | 39,3 |
| Gesamte gewerbliche Wirtschaft | 639.190 | 100,0 | 167.818 | 100,0 | 26.999 | 100,0 |

Auf Grund des Erfassungsumfangs der Leistungs- und Strukturstatistik (ÖNACE B-N, S95) kann es zu Untererfassungen einzelner Sparten/Fachverbände in der Auswertung nach der Kammersystematik kommen. Dies betrifft in der Auswertung nach Sparten insbesondere die Bereiche Tourismus und Freizeitwirtschaft sowie Gewerbe und Handwerk.

KMU = Kleine und mittlere Unternehmen; GU = Großunternehmen

Quelle: Statistik Austria

Figure 23: Selected economic numbers of Austrian companies by company size (numbers of employees)

B. Original Questionnaire in German

1 Einleitung

1.1 Kurze Vorstellung

- Thema der Diplomarbeit: „Digitalization in SME: a framework to get from strategy to action“
- Zielsetzung der Interviews
- Einschränkung auf mittlere Unternehmen (ca. 20-250 Mitarbeiter), keine Einzelunternehmer
- Hinweise: Aufzeichnung OK; Interviews werden anonym transkribiert

1.2 Name

1.3 Funktion

1.4 Digitalisierung Schwerpunkt

1.5 KMU Erfahrung

2 Begriffe

2.1 Was verstehen Sie unter Digitalisierung?

2.2 Im englischen werden zwei Begriffe verwendet:

Digitalisation/Digitisation: sehen Sie einen Unterschied?

2.3 Gibt es für Sie einen Unterschied zwischen Digitalisierung und Digitaler Transformation?

3 Framework (definierte Vorgehensweise/Inhalte)

3.1 Was sind die relevanten Bestandteile einer Digitalstrategie?

3.2 Kann es ein branchenunabhängiges Framework geben?

3.3 Gibt es Frameworks, die Sie benutzen/als sinnvoll ansehen?

3.4 Welche Elemente sollte Ihrer Meinung nach ein Digitalisierungsframework beinhalten?

3.5 (Optional) Ich frage Sie gezielt nach bestimmten Elementen, die in zahlreichen Frameworks vorkommen, bitte geben Sie Ihre Einschätzung dazu ein:

3.5.1 Bestandsaufnahme/Assessment/Reifegradmodell

3.5.2 Kernkompetenzen

3.5.3 Kunden/Zielgruppen

3.5.4 Anforderungen

3.5.5 (neue) Zielgruppen

3.5.6 Markt und Wettbewerb

3.5.7 Trends

3.5.8 Vision

3.5.9 Zieldefinition

3.5.10 Bestehender/geplanter Digitalisierungsgrad

3.5.11 Projektdefinitionen

3.5.12 Handlungsfelder

3.5.13 Priorisierung

3.5.14 Budget/Business Assessment

3.5.15 KPIs

3.5.16 IT Systeme

3.6 Wo/in welchen Bereichen sehen Sie die relevantesten Hebel/Mechanismen?

3.7 Was muss eine Digitalisierungsstrategie berücksichtigen, damit eine Umsetzung

gelingt?

4 Dimensionen (Handlungsfelder) der Digitalisierung

- 4.1 Welche Dimensionen sind Ihrer Meinung/Erfahrung nach in einem Digitalstrategieprozess relevant?
- 4.2 (Optional): Ich frage Sie gezielt nach bestimmten Dimensionen, die in zahlreichen Frameworks vorkommen:
 - 4.2.1 Unternehmenskultur
 - 4.2.2 Leadership
 - 4.2.3 Prozesse
 - 4.2.4 Produkte/Services
 - 4.2.5 Technologien
 - 4.2.6 Kundenbeziehungen
 - 4.2.7 Mitarbeiter/Kompetenzen
 - 4.2.8 Cloud & Data
 - 4.2.9 Produktion
 - 4.2.10 Geschäftsmodelle
- 4.3 Thema Geschäftsmodelle
 - 4.3.1 Ist Geschäftsmodell-Innovation (immer) ein Teil einer Digitalstrategie?
 - 4.3.2 Netzwerk-Ökonomie: ist das für die Digitalisierung immer relevant?

5 Vorgehensweise

- 5.1 Welche Vorgehensweise sehen Sie als ideal an, um zu einer Digitalstrategie zu gelangen?
- 5.2 Was ist eine adäquate Dauer und Intensität eines Strategieprozesses (Durchlaufzeit, konkrete Zeit in Workshops, für Vorbereitungen)?
- 5.3 Wie viel Budget sind Ihrer Erfahrung nach KMUs bereit, für Strategie auszugeben?
- 5.4 Wer ist intern und/oder extern involviert und in welchem Ausmaß?
- 5.5 Wie stark sollen/müssen Kunden involviert sein?
- 5.6 Wer vom Unternehmen sollte involviert sein?

6 Resultat (Artefakte)

- 6.1 Was sind für Sie die Resultate einer Digitalstrategie?
- 6.2 Für welchen Zeitraum wird sie erstellt?
- 6.3 Welchen Detaillierungsgrad soll das Resultat besitzen?
- 6.4 Sehen Sie eine "digitale Roadmap" als Resultat einer Digitalstrategie?
 - 6.4.1 Wenn ja, was muss die beinhalten?
 - 6.4.2 Wie detailliert sollte das Resultat sein?
- 6.5 Sehen Sie einen Aktionsplan als Resultat einer Digitalstrategie?
 - 6.5.1 Wenn ja, was kann ein Aktionsplan beinhalten?
- 6.6 Sehen Sie Verantwortlichkeiten und Kennzahlen als Teil der Strategie?
- 6.7 Sehen Sie eine IT-Landkarte als Teil einer Digitalstrategie?
- 6.8 Wenn ja, wie kann sie aussehen?

7 Weitere Anmerkungen

- 7.1 Gibt es relevante Themen, die nicht angesprochen wurden?

C. Examples for coding

| Int. # | | Thema Netzwerkökonomie | | | |
|--------|------|------------------------|---|--|--|
| page | line | | | | |
| 1 | 10 | 400-402 | Das ist immer ein Thema, dass man anspricht, wo ich noch sehr viele Zurückhaltung sehe, also dieses, wir arbeiten zusammen und Kooperation statt Wettbewerb, gerade in den Bereichen, wo viele jetzt zusammenarbeiten sollten, um sich gegen andere stark zu machen. Das ist was, was noch nicht wirklich in den Köpfen ist. | Network economy and cooperation instead of competition is not yet in the minds of people. | Network-economy: - not yet in the minds of people - a question of trust and culture, rather analogue - not necessarily part of the strategy process - considered in the strategy, especially in relation to outsourcing - when discussion resources, benefits become clear - platforms and scaling effects discussed when business models are spoken of - needs to be discussed and is relevant, but increases complexity |
| 2 | 5 | 203-211 | Ich habe das Gefühl, dass es Betrieben nach wie vor schwerfällt, sozusagen ihre eigene Grenze durchlässig zu machen und sich zu verzahnen mit anderen Betrieben. Sei es horizontal oder vertikal. Das ist immer eine Vertrauensfrage, wie sehr öffne ich mich, wie sehr lasse ich mich auf einen Partner ein, macht der dann möglicherweise das Geschäft alleine ohne mich, verliere ich damit möglicherweise Kunden oder die Kontrolle über Ressourcen, wenn ich mich mit einem Partner zu sehr verzahne. Also, das ist auch eine Vertrauensfrage, durchaus dann auch eine Kulturfrage, ja, das funktioniert nicht einfach. Am ehesten, ist meiner Erfahrung nach, funktioniert es in so durchaus sozusagen aus der analogen Welt kommend in solchen Netzwerken, wo Unternehmer auch einmal die Möglichkeit haben sich zu beschnuppern und sich kennenzulernen, von Mensch zu Mensch, und aufbauend auf dieser Vertrauenskultur dann auch geschäftliche Kooperationen einzugehen | Hard for companies to open boundaries, horizontally and vertically. Fear of loss of customers or control of resources. Networking is a question of trust and culture. It works best through existing analogue networks. | |
| 2 | 5 | 224-226 | Die Netzwerk-Ökonomie in der digitalen Welt, die ist sicher sehr bestechend von der Effizienz, von der Idee, vom Modell her, ja, aber die sehe ich in der Praxis auch nicht so häufig, ja. | Network-economy in the digital world is surely captivating in it's efficiency, from it's idea and model, but I rarely see it in reality. | |
| 3 | 12 | 39-447 | Ja ist definitiv bei der Wertschöpfungskette und vor allem dann das Partnersegment dort eingegliedert zu berücksichtigen. Was ist das Umfeld vom Unternehmen, welche Strukturen werden verfolgt und wie kann man da das am besten nutzen die Synergieeffekte oder die Digitalisierungseffekte. Und was ist vor allen schon vorhanden, was man definitiv merkt durch die Digitalisierung, ist, dass Aufgaben bestmöglich ausgelagert werden. Alles was nicht direkt in die direkte Wertschöpfung fällt, wird bestmöglich in eine der zwei Richtungen ausgelagert. Entweder zu den Partnern, zu den Lieferanten, zu den Kunden, genau also fokussieren auf die eigentliche Wertschöpfungskette, | Network economy definitely needs to be looked at - what is the ecosystem, which structure are followed, how can you best use synergy effects or digitalization effects. Which tasks can be outsourced. Everything that is not part of direct value creation is outsourced - either to partners, suppliers or to customers. | |
| 5 | 8 | 306-312 | B: Ich bringe, wenn es um Geschäftsmodelle geht, immer einige Beispiele die halt global größer und genau in diesen Netzwerkeffekten und Ökosystemdenken angesiedelt sind, ja. Also ich bringe eigentlich immer Beispiele in diesen Größenordnungen auch mit ein, ja. Also gehört gezielt natürlich auch mit erwähnt und was weiß | When I talk about business models, I always bring examples that are global and that are located in eco-system thinking and network effects. This needs to be mentioned, platforms are an | |

| | | | | | |
|---|----|---------|--|--|--|
| | | | <p>ich Plattformen sind ja als wesentliches Geschäftsmodell, egal in welche Richtung und auch so diese Dienstleistungen rund um / eigentlich nicht digitale Produkte ja. Man kann um jedes Produkt ein digitales Ökosystem aufbauen heutzutage, ja. Um auch halt so Netz- und Skalen-Effekte erzielen zu können.</p> | <p>essential business model as well as services around products. You can enhance a product to an ecosystem, today. And gain network and scale-effects</p> | |
| 6 | 8 | 359-364 | <p>B: Nein eigentlich gar nicht, weil es eigentlich schnell klar ist, also wenn man das bestehende Geschäftsmodell um Digitalisierungsaspekte anreichert, das es kein Know-how im Unternehmen gibt, dass es schwer ist dieses Know-how zu entwickeln, dass es lange dauert, dass es total viel kostet. Und dass man dann die Strategie auch gar nicht erst zu beginnen braucht, wenn man nicht mit Externen zusammenarbeitet, sich öffnet auch neues Know-how und neues Team hineinholst. Also ein halber Tag, dann ist das sehr klar.</p> | <p>When you enhance existing business model with digitalization aspects, it becomes clear that there is no know-how in the company, and that it takes time and money to develop it. Also, that the strategy will only work when the company cooperates with externals, opens up for new know-how and brings in a new team. It takes half a day to set that straight.</p> | |
| 7 | 11 | 416 | <p>Muss man sich, wenn man Digitalstrategie fährt, auch dieses ganze Thema Netzwerk Ökonomie, muss man es im Auge behalten, ist das ein Teil, der zumindest einmal angesprochen werden muss: Naja es ist ein wichtiges Prinzip, was in manchen Bereichen eine Rolle spielen kann.</p> | <p>Network economy is an important principle that might play a role in some areas.</p> | |
| 7 | 12 | 432-433 | <p>B: Die Antwort auf Ihre Frage wäre, ja, man sollte das Konzept verstanden haben, aber nein, es spielt jetzt in jeder Digitalisierungsstrategie eine Rolle.</p> | <p>The answer to your question is: the concept needs to be understood, but it is not relevant for the digitalization strategy.</p> | |
| 8 | 8 | 268-273 | <p>B: Ja, das ist extrem relevant, weil man gerade in Österreich, kommt man ja gar nicht zu den Finanzierungen, die man benötigen würde, um alles selbst zu machen, das ist einmal ein Aspekt. Der zweite Aspekt ist, dass andere bestimmte Dinge einfach schon besser können und auch schwierig ist Leute zu finden. Aber es bringt natürlich auch eine Komplexität auf einer höheren Ebene, weil man diese Netzwerke dann auch alle managen muss, ja. Aber grundsätzlich ist es auch ein wesentlicher Aspekt ja.</p> | <p>Network economy is extremely relevant, especially in Austria, to get your financing. Second, others can do things better and it is hard to find people. But it increases complexity on a higher level, because all the networks need to be managed.</p> | |