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DIGITALLY TRANSFORM OR DIE?

Master's Thesis
to confer the academic degree of

Master of Science
In the Master's Program

General Management

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STATUTORY DECLARATION

I hereby declare that the thesis submitted is my own unaided work, that I have not used other than the sources indicated, and that all direct and indirect sources are acknowledged as references. This printed thesis is identical with the electronic version submitted.

Ort, Datum

Signature

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EXECUTIVE SUMMARY

Digital transformation is no longer a challenge of the future. It has finally reached a degree of influence where it actively changes and reshapes the ecosystem of industries (Bender & Willmott, 2018; Bughin et al., 2017). In this regard, companies realized that digital market disruptions have the potential to significantly harm successful business models. Therefore the pressure to launch measures against a growing digital backlog and the need for a digital transformation strategy is growing (Bechtold & Lauenstein, 2014, p. 9; Fitzgerald, Kurschwitz, Binet, & Welch, 2013, p. 6).

Even though the amount of research executed on this topic gains notable attention in academia, only little information on the sources of transformative pressure as well as important dimensions in digital transformation strategy are available in existing literature. The aim of this Master Thesis is to analyze the strategic challenges of digital transformation by investigating the root of digital transformative pressure and the strategic process of implementing digital transformation. From this basic goal the main research questions are derived: “Where does digital transformation pressure emerge from and is digital transformation a “Die Factor”? and “How do companies digitally transform to maintain the competitive advantage from disruptive innovations and changing markets?”. In order to answer the proposed research questions, the thesis finds its conclusion based on two sources of information. On the one hand, a comprehensive literature research builds the theoretical foundation to answer the research questions. On the other hand, the empirical part of the thesis enhances the literature by providing insights based on 12 interviews with CEOs, digital transformation experts and consultants from Upper Austria.

The results of the empirical part of this paper prove the intensity and influence of digital transformation. The industry experts understand digital transformation as a prerequisite for future success and see it as die factor for companies which do not take proactive actions to transform. Nevertheless, the experts state predominantly that digital transformation occurs on a continuous basis and not as a radical transformation in the form of a big bang. Furthermore, they identify market pressure as the most significant driver. Theory as well as the empirical results highlight its predominant influence. Concerning additional forms of pressure, significant disagreement exists and no common agreement between experts and theory was found yet. This proves the influence of exisiting uncertainty and the effects of personal perception onto the endresult in digital transformation efforts.

Successful digital transformation is built on multiple pillars that involve the company as a whole. In order to succeed in digital transformation, the integration of measures needs to go beyond the borders of products and processes. Therefore a high degree of alignment and clear priorities that

combine the independent threads of digital transformation efforts are required in strategy development in order to improve the companys digital DNA (Matt, Hess, & Benlian, 2015, p. 340). In terms of responsibilities, a clear alignment either to the CEO with strategic agility, or to a Chief Digitization Officer with coordinative foresight and digital focus is suggested, as the support of the C-level is identified as a critical success factor. Nevertheless, a CEO or CDO cannot transform a company alone. Only by the support of promotors throughout the whole company who spread the word and create a positive attitude, can a sustainable transition occur. For the overall organizational structure, the results of the study emphasize the centralization of the digitization department with a close alignment to the management board in order to be able to react to changes of all kinds quickly. As a further pillar, the study identified step by step incremental development as the most suitable form of development for transforming a company. It develops the corporate culture and enables the organization to acquire digital competence in a safe learning environment. Additionally, it limits the risk of failure due to small work packages and incremental steps of development. The results of the study on digital change management show that digital transformation is a continuous process that needs to develop the corporate culture to reduce uncertainty, anxiety and develop a workforce which is capable to handle the challenges of digital transformation.

All in all, the research results show that digital transformation is subject to continuous and fast development not only on the technological level but also in terms of managerial, organizational, structural and human matters. It is clear that digital transformation is a success factor for companies in the future, but the intensity and development speed are highly specific to the business environment a company operates in. Even though the challenge of realizing the digital transformation can be analyzed and described with traditional change methods, decision makers must not act with a yesterday's logic. To succeed in digital transformation, a balance between circular planning and agility in decision making combined with intensive efforts to develop the workforce are needed, as the end result of digital transformation is not clear yet.

Keywords: digital transformation, transformation pressure, digital strategy, digital challenges, digital change management

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LIST OF ABBREVIATIONS

CDO ..... Chief Digitalization Officer
CEO..... Chief Executing Officer
CIO ..... Chief Information Officer
e g. ..... exempli gratia (for example)
EBSCO..... Elton Bryson Stephens Company
et al..... et alia (and others)
f ..... folio (and the following)
ICT..... Information and Communication Technology
IS ..... Information Systems
IT ..... Information Technology
p. ..... page
SBU ..... Strategic Business Unit
DACH ..... Deutschland-Österreich-Schweiz
DT..... digital transformation

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1. Introduction

This introductory chapter builds a basic understanding of the relevance of the Master Thesis– Digitally Transform or Die!. It introduces the reader to the challenges of the thesis by elaborating the problem statement, the clarification of the objective and the definition of the research question. Finally, it provides insight into the research methodology as well as an overview of the structure in order to be able to navigate quickly.

1.1. Problem statement

“Organizations are urgently required to start taking action now, as their digital backlog is rapidly growing and building a momentum that puts their very survival on the line” (Bechtold & Lauenstein, 2014, p. 19).

The influence of digital transformation has finally reached a level where it actively changes and shapes the eco-system of industries (Bender & Willmott, 2018; Bughin et al., 2017; Fitzgerald et al., 2013; Kane, Palmer, Phillips, Kiron, & Buckley, 2015). In this regard, organizations realized that digital market disruptions have the potential to harm successful business models severely and that a rapidly growing digital backlog endangers the future survival of the whole organization (Bechtold & Lauenstein, 2014, p. 9; Fitzgerald et al., 2013, p. 6).

Bughin et al. (2017), understands digital transformation as a set of opportunities to develop and increase efficiency, but it also opens doors to enter the market for disruptive attackers who change the business environment. In this regard, discussions especially on C-suite levels come about as to how leaders should react to digital transformation before it is too late (Bender & Willmott, 2018, p. 1; Fitzgerald et al., 2013, p. 3). The research results of Westerman et al. (2012a, p. 9) confirm these findings and claim that C-level managers experience pressure to actively start to develop and implement measures of digital transformation especially from competitors and customers.

In this sense Christensen and Brower (1996, p. 197) state that failures of industry role models in digital transformation are connected to several reasons such as lethargy and blind spots in decision making of the management as well as lacking digital transformation knowledge and inadequate resources. Through the eyes of Schwertner (2017, p. 390), these challenges have effects particularly in the manufacturing industry as the digital transformation focuses mostly onto efficiency aspects within production, as development attention is payed to process development, mobile applications, and production-oriented databases. On the contrary Christensen and Bower (1996, p. 198) as well as Westerman et al. (2012a, p. 17) highlight that the core reason of failure of large corporates is not directly dependent on the selected technology, its novelty on the market

or the required skill level for successful integration. The challenge is to development a holistic system of customer experience, operational processes and the business model. All in all, Matt, Hess and Benlian (2015, p. 339) summarize, companies who work on these multiple challenges need to realize the importance of developing a centralized strategy that coordinates, prioritizes and implements digital transformation efforts within a company in order to protect their market share and to stay competitive.

1.2. Objective

The previous elaboration showed that the industry ecosystem is changing and that C-level managers feel pressure to take action in order to make the company ready for digital transformation and to protect the competitive advantage from changing market paradigms.

Based on the initial findings, the research question is defined as:

Where does digital transformation pressure emerge from and is digital transformation a "Die Factor"?

How do companies digitally transform to maintain the competitive advantage from disruptive innovations and changing markets?

In order to answer the research questions, the conceptual idea of this thesis is to clarify the intensity of digital transformation and to identify the most significant driving factors to launch digital transformation efforts. Liere-Netheler et al. (2018, p. 3933) emphasize the importance of this understanding, as basis for digital transformation efforts. The second research question aims to understand the process and relevant dimensions of digital transformation and follows a holistic approach. As the ability to transform existing business models is built on a thorough digital strategy, which supports leaders to develop a new corporate culture and to apply new innovations. (Kane et al., 2015, p. 3)

1.3. Methodology

For the purpose of this research project, a theoretical analysis of literature, as well as a qualitative study is identified as the appropriate methodology. The proposed research model of Tranfield et al. (2003, p. 214) is identified as the most suitable research model for this thesis. According to the suggested model, literature research is split into three parts. The initial planning stage aims for the identification and description of the underlying research problem. In the second stage, the author searches for adequate studies to extract relevant information and consolidates the identified data.

In the final stage, the evidence is brought into context and concluding remarks are made. As sources for literature, several databases made available by the JKU are used to find relevant literature. Keywords for the literature research are identified in the primary literature screening. Therefore, applied keywords are for example: digital transformation, IT enabled transformation, digital transformation strategy formulation, and digital change management. As suitable sources for the literature research books, white papers of credible consultancy firms, as well as, online databases such as Springer Professional, EBSCO, Google Scholar, EconLit, EconPapers, Emerald Insight, Sage Journals Online and Science Direct were identified to provide up to date insights.

Concerning the selection of trustworthy scientific literature, the suggestions of the peer platform VHB were followed. VHB rates scientific management literature based on their quality. The rating reaches from A+ to D. For the sake of the thesis, the maturity of cited articles are from journals. However, as digital transformation is at the spotlight of research interest, also non-rated journals are accepted. Furthermore, the extensive research of Vial (2019) showed that digital transformation issues are actively discussed in conference proceedings. In order to be able to build upon the latest research, results from conferences were included in the research too.

Secondly, a qualitative study is built on the research guideline of Mayring (2015). As a sample Upper Austrian business which actively work on digitalization were selected to participate in the study. The spotlight of research is focused on Pier 4 participants. The industry scouting program Pier 4 actively supports participants in the innovation process. The candidates are ideal as they actively take measures to innovate their business. Therefore, members of the board or digital transformation officers as well as consultants can provide detailed insider information and contribute to the holistic research aim of the thesis.

1.4. Structure

Westermann et al. (2012a, p. 17) and Christensen & Bower (1996, p. 198) claim that digital transformation requires a holistic approach to tap the full potential of digital transformation. Based on this argument this Master Thesis is designed on a four-layer research approach.

The first layer of the research model assesses the driving factors for digital transformation and takes a detailed look at changing markets and diffusing technologies. The second layer researches the strategic requirements and the third dimension assesses the challenges of change management in light of the digital transformation. Finally, the qualitative study provides insight into companies and enhances the existing literature by experts opinions on digital transformation.

In detail assesses the first layer of the research framework the driving factors for digital transformation. The core focus is the external influence and therefore to investigate transformative pressure that face companies from rapid changes in market environments and technological diffusion.
The second stage of the research framework is concerned with the analysis of digital transformation strategy development. Based on a comprehensive investigation of strategy development literature, the sub-chapter focused on digital strategy finds specialties for digital strategy formulation. Furthermore, critical dimensions of digital transformation are assessed in detail.

The third dimension of the proposed research framework investigates digital change management. It aims to find and understand important dimensions for a successful introduction of digital transformation. Similar to the previous section, an analysis of standard literature serves as a basis for developing digital implications.

The empirical analysis takes a detailed look at how companies approach the challenge of digital transformation and serves as a second information source and as a benchmark to draw conclusions. Further details concerning the research design of the qualitative study are presented in the empirical part of the thesis.

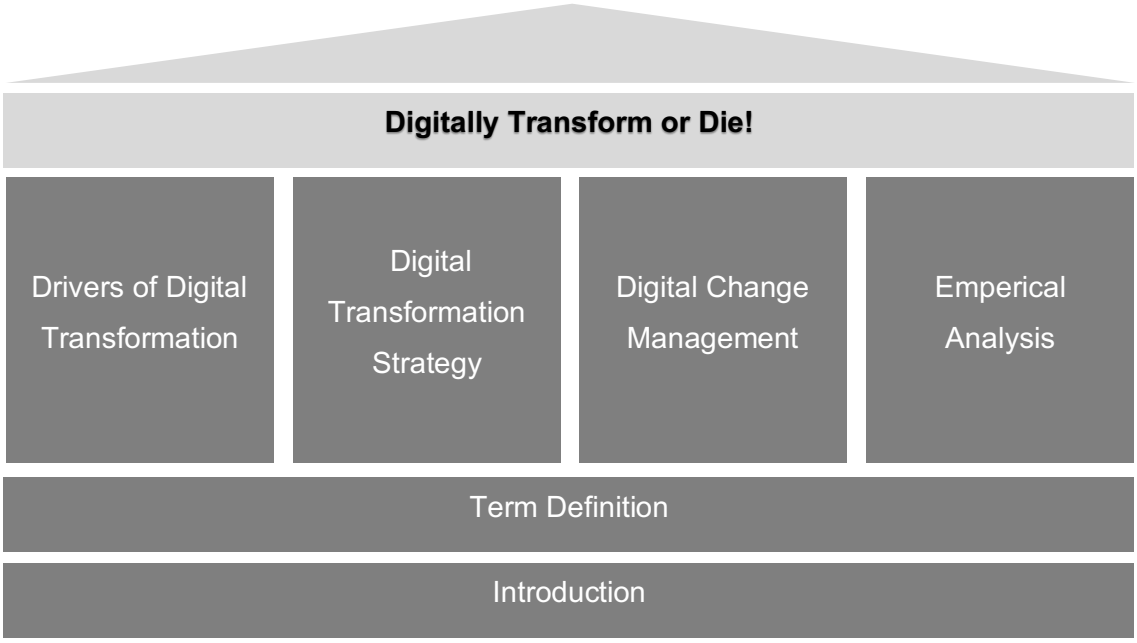


Figure 1: Structure of the thesis
Source:Own Ilustration

2. Term Definition

The following chapter creates the theoretical foundation for digital transformation. Jared Chils (2017) highlights in his article, the popularity of the buzzword digital transformation, as it is used commonly in C-Level meetings, strategy reports and research papers of consultancy companies. The importance of adaptation to shifting competitive market requirements and emerging technologies is additionally emphasized by a significant number of researcher papers conducted. (Bechtold & Lauenstein, 2014; Fitzgerald et al., 2013; T. Hess, Matt, Benlian, & Wiesböck, 2016; Kane et al., 2015; Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2012a). Chills states (2017) that the challenges of the digital era cannot be summarized in “transformation” only. Therefore, he identifies business transformation, IT transformation and digital transformation as required terms for further discussion. The term business transformation is reviewed to serve as basic understanding of transformation processes and as a reference point for comparison.

2.1. Business Transformation

In the context of business transformation, research interest peaked around the dawn of the millennium when two research streams were in the spotlight. On the one hand, researchers who identified the transformational dimension on the organizational level such as Kotter (1995), Newman (2000), Wischevsky and Damanpour (2006) and Weick and Quinn (1999). On the other hand, another group of researchers included Morgan et al. (2008), Sauer and Willocks (2003), Mc Keown and Phillip (2003), Muzyka et al. (1995) and Lateur et al. (2015) use the term business transformation and follow a holistic approach.

In his approach, Kotter (1995, p. 3) identifies the underlying desire of every attempt of transformation. The research findings state that every transformation aims to adapt new paradigms in order to secure the future of the business. Newman (2000, p. 603) draws attention to the need for organizational adaptation in terms of the internal structure. At this point, Weick and Quinn (1999, p. 362) add to the discussion that forms of change are caused by different reasons for transformation needs. The more recent approach of Wischevsky and Damanpour (2006, p. 104) interprets organizational transformation as a transition between organizational states that differ substantially in important features such as strategy and structure.

Available literature that follows the second transformation research stream describes the topic as business transformation. In this sense, McKeown and Philip (2003, p. 3) define business transformation as “… an overarching concept encompassing a range of competitive strategies, which organization adopt in order to bring about significant improvements in business

performance". The underlying theoretical basic research on this topic was executed by Muzyka et al. (1995). Their transformation model is built on four pillars which promote transformation: (1) reengineering, (2) restructuring, (3) renewing and (4) regenerating. The primary two pillars promote an instant and perceptible impact on the organizational structure of companies, whereas the stage of renewing promotes entrepreneurial behavior. The final pillar, which partially includes elements of the previously mentioned factors, focuses on the improvement of existent procedures by a reinterpretation of strategy and evaluation of available opportunities. Lateur et al. (2015, p. 2) understand business transformation in a way that managers are in charge of successfully transferring the company together with its employees. Furthermore, they claim that success is highly dependent on internal willingness and the motivation for change. Morgan and Page (2008, p. 155) build on the previously elaborated approaches and highlight the degree of individuality in transformation projects and the uniqueness of every process itself.

2.1. IT Enabled Transformation

Contrary to traditional business transformation, Venkatraman (1994, p. 73) identified the broad scope of information technology and its major influence in the creation of a flexible business network. Venkatraman (1994, p. 74) presents in this regard the five levels of IT enabled business transformation. The framework builds on a two-pillar model. On one side, the potential benefits incorporated by the application of IT technology and on the other side, the radicality of business transformation. As a concluding remark, Venkatraman states (1994, p. 74) that the elemental hypothesis of the model, suggests that IT induced transformation is ineffective on existing organizational models. In other words, this means that IT enabled transformation also requires the adaptation of structure, culture, strategies and processes. Besson and Rowe (2012, p. 103) mention the credibility of Venkatraman (1994) and highlight the promotional effects for further research in this regard. From the understanding of Morgan and Page (2008, p. 163), IT enabled transformation is built on two dimensions, on the one hand, the core competencies of the company and on the other hand, the adaptation of the business model to newly introduced technology. In their model Morgan and Page (2008, p. 163) identify technological (1) adaptation as the starting point where selected activates are automated. In the (2) evolving stage, IT promoted synergies lead to internal improvement of performance. After the technological introduction, the business network is (3) redesigned, and processes are adapted to the new scope of activities. Finally, in the (4) renewing stage, the business is transformed. Hess et al. (2016, p. 3) combine the findings and state that the IT enabled transformation focuses on the challenges of information transferal. In other words, this means the conversion of analog information management into a digitized system as well as the engineering efforts of automation in factories and communication technologies. Dehning et al. (2003, p. 639) agrees with the opinion of Venkatraman (1994) and

states that IT technologies are transformational if fundamental ways of doing business are changed. This can occur on the procedural as well as the relationship layer. Dehning (2003, p. 654) highlights in this discussion the drastic change in task completion at the introduction of IT tools. In the review of the research group Melville et al. (2004, p. 287) IT enabled transformation is brought into context with IT business value research. This research stream investigates the impacts of IT on productivity, the ability to increase profit, support in cost reduction, the influence on the competitive advantage and other performance critical dimensions. Lynne et al. (1997, p. 55) demonstrate that the focus of IT enabled transformation is focused on the strategy of functional levels. They understand IT enabled transformation "as a business process that crosses several functional lines." Besson and Rowe (2012, p. 117), who conducted a thoroughly executed research paper on information system based organization transformation, raise severe points of criticism on the currently available literature. They claim that even though the issue is well described, the theory lacks analytical frameworks for the phenomenon.

2.1. Digital Transformation

The buzzword digital transformation emerged from approximately 2013 on as a large number of papers show (Bechtold & Lauenstein, 2014; Fend & Hofmann, 2018; Fitzgerald et al., 2013; T. Hess et al., 2016; Matt et al., 2015; Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2012a). Therefore, also various approaches to find a definition were executed, as the broad literature review of Vial (2019) shows. Hess et al. (2016, p. 60) claim that the digital transformation is also described as digitalization and that its main objectives are directly interconnected with the challenges of digital technologies. In this regard, services processes, business models, as well as organizational structures, are subjects of change. Through the eyes of Schwertner (2017, p. 388f), digital business transformation "is the application of technology to build new business models, processes, software and systems that result in higher profitability, greater competitive advantage and higher efficiency." Furthermore, Schwertner claims that ongoing transformation of processes, development of workforce skills and customized user experience are pre-requisites to achieve a successful transformation. Fitzgerald (2013, p. 2) understands digital transformation as "..the new digital technologies (social media, mobile, analytics, or embedded devices) to enable significant business improvements such as enhancing customer experience, streamline operations or creating new business models."

Westerman et al. (2012a, p. 5) identify a significant change in the industrial ecosystem and see that executives throughout all industries are adopting digital transformation tools. As necessary dimensions for digital transformation, Westerman et al. (2012a, p. 17) identify customer experience, operational process and the business model. Based on these findings, the

researchers (Westerman et al. 2012a, p. 5) define it as "… the use of technology to radically improve performance or reach of enterprises". Piccinini et al. (2015, p. 7) also refer to the importance of enhancing the customer experience and the influence on business models. For them "digital transformation involves leveraging digital technologies to enable major business improvements, such as enhancing customer experience or creating new business models." The definition of Matt et al. (2015, p. 340) sees digital transformation strategy " … as a blueprint that supports companies in governing the transformations that arise owing to the integration of digital technologies, as well as in their operations after a transformation". In the direct comparison to Westerman et al. (2012a), the findings differ more. Also, the underlying theoretical approach is built on different pillars. Matt et al. (2015, p. 341) draw the attention to (1) financial aspects as the center of all issues, (2) a change in value creation, (3) structural changes, and the (4) dependency of technology application. The understanding of Berghaus and Back (2016, p. 3) involves the digitization process as well as the digital innovation focus. Compared to the other findings of the definition search, Berghaus and Back (2016, p. 3) are the only researchers who focus extensively on the organizational development and the process improvement dimension. Nevertheless, they identify the challenges of the digital change process. In this sense, it is required to build the necessary capabilities and mechanisms of digitization within the company.

2.2. Summary and Comparisons of Terms

The assessment of the three terms shows the evolvement of digital development. The basic assumptions of business transformation are still valid for IT enabled transformation as well as the digital transformation. However, significant differences are indefinable between IT enabled transformation and digital transformation. The researchers (Dehning et al., 2003; T. Hess et al., 2016; Lynne & Benjamin , 1997; Melville et al., 2004; Venkatraman, 1994), who executed academic works on IT enabled transformation, point out the functional orientation of IT enabled transformation. They aim for process and efficiency improvement, whereas the researchers (Fitzgerald et al., 2013; Matt et al., 2015; Piccinini et al., 2015; Vial, 2019; Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2012a) focus on the holistic approach to change the whole value creation. Critical dimensions for digital transformation in this regard are the adoption of the company structure, customer focus, reorientation of the business model and the application of adequate technology.

3. Drivers of Digital Transformation

This chapter delves into the first layer of the previously introduced four-layer framework. It assesses driving factors for digital transformation that impact companies from outside the organizational structure. In order to create a sustainable knowledge base for the reader, relevant factors of changing markets and diffusion of technology are presented. Regarding the main research aim of the thesis, the focus of investigations is put onto disruptive innovation. Therefore, the research results of the authors Christensen and Bower (1996) are applied, among others.

An important constraint of this thesis is the selection and identification process of technologies and threatening market changes. In this context, Robbins et al. (2010, p. 457) define organizational culture as ”a system of shared meaning held by members that distinguish from other organizations.” The definition shows the high degree of individuality of organizations and the people within its boundaries. Based on this assumption, it can be said that every company sees technologies and changes through different eyes.

Even though the selection procedure of technology has an important role in transformation efforts it will only be touched on the surface in this thesis, due to complexity of the process itself. The thesis assumes that involved decision makers take the best and most adequate decision in favor of the company.

The analysis of Liere-Netheler et al. (2018, p. 3930) and the supporting findings of Bharadwaj et al. (2013, p. 473) provide insights into the roots and dimensions of digital transformation. The independently executed studies identify two significant groups of influence. On the one hand, organizational drivers or internal factors and on the other hand, effects that promote digital transformation from the outside. Liere-Netheler et. Al (2018, p. 3930 f) highlight organizational (internal) drivers such as (1) process improvement in the form of downtime reduction and error rates, (2) cost reduction driven by higher precision and error avoidance and (3) management support as the need for faster decision-making increases. The findings of Hess et al. (2016, p. 128) support these findings by highlighting case-study results, as interviewees claimed that increased financial pressure led to a change in strategy. On the external driver dimension, Liere-Netheler et al. (2018, p. 3930 f) identify drivers such as (1) marked pressure and (2) customer demands. Furthermore, B2B companies experience pressure within (3) supply chains to transform, as partners expect data exchange. Different from Liere-Netheler et al. (2018), Haffke et al. (2016, p. 11) explicitly state that external factors drive digital transformation. They claim that changing customer needs and behavior, as well as technologically advanced competitors, make it necessary to transform and adapt in order to maintain the competitive advantage. Berghaus and

Back (2016, p. 12) are in line with the findings of Haffke et al. (2016, p. 11) and claim that a missing strategy makes it impossible to build upon internal transformation needs. In the end, this leads to reactive decision making that is driven by external influencing factors. The recent and detailed literature review of Vial (2019, p. 15), which compares the concepts of IT enabled transformation and digital transformation, agrees on the results. Vial (2019, p. p.15) argues that IT enabled transformation emerges from inside the company. Whereas digital transformation, is predominately triggered from outside the company.

However, in a second stage, digital transformation occurs based on internal factors. As an illustrative example, Vial (2019, p. 15) states that customers use modern sales and distribution channels to purchase products. In order to tap this potential, companies are required to develop internal skills to adapt and enhance the customer experience. Piccinini et al. (2015, p. 13) consider to which degree the competitive role changes in the context of partnerships as technological convergence drives to some degree the transformation but also creates dependencies in terms of infrastructure. Besides the significant number of researchers who see market and customer need changes, as the central driver of digital transformation, only a small number of researchers claim that technology is the main driving force. For example, Whangthomkum (2006, p. 32) concludes that the external inflow of technology reduces cost and increases efficiency.

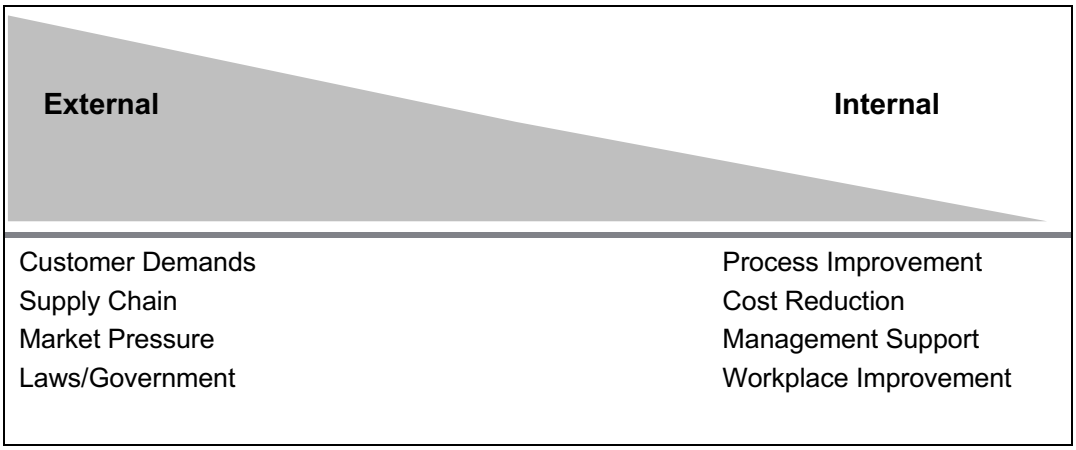


Figure 2: Drivers of digital transformation
Source: Own Illustration based on Liere-Netheler et al. (2018, p. 3930)

As a concluding remark, it can be said that changing markets are a key driver for digital transformation. Nevertheless, literature sees the importance of technological adaption to stay competitive. Therefore, the following chapter assesses types of rapid market changes and the effects of diffusion of technologies in detail.

3.1. Changing Markets

3.1.1. Disruptive Innovations

The chapter Disruptive Innovations aims to evaluate the dimensions of disruptive innovations and to present the challenges incumbent companies face. As it is the most important sub-topic in the market disruption chapter, detailed insights will be provided by assessing different theories and the identification of warning signs.

The understanding of Johnson et al. (2017, p. 317) for innovation involves a certain degree of dilemma, as it contains a high degree of uncertainty. Managers need to make decisions based on three fundamental dimensions: the (1) degree of adaptation towards new technologies, with no regard to the market, the (2) degree of product development over process innovation and the (3) individual openness towards innovation. For Trott (2016, p. 15) the equation of innovation consists of theoretical conception, inventions on the technical layer and the possibility for commercial exploration. Bergmann (2000, p. 19) found a very pragmatic and straight forward definition as he claims that innovations are ideas which are perceived as new and valuable by a particular group of people. However, for the scope of this thesis, innovation shall be understood as, "… the conversion of new knowledge into a new product, process or service and the putting of this new product, process or service into actual commercial use" (Johnson et al., 2017, p. 317).

The research on disruptive innovations has a long tradition and has ever since been subject to extensive research as a wide number of research papers show (Abernathy & Clark, 1985; Adner, 2002; Christensen, 2005; Paap & Katz, 2016; Trott, 2001). The first research team who used the term “disruption” in their paper were Abernathy and Clark (1985, p. 4). Their framework identified that innovations are a non-unified phenomenon, as some innovations harm developed revenue streams and make working business models obsolete but develop business opportunities at the same time. Even though it is highly unlikely that frameworks of single researchers become standard in academia, Danneels (2004, p. 246) and Adner (2002, p. 667) as well as more than 18,000 citations listed on google scholar (2001) highlight the fundamental credibility of Christensen’s research.

Christensen (1997, p. 10) identified in his basic framework two types of innovation that significantly differ. On the one hand there are sustaining technologies and on the other hand that which disrupt markets. Based on this classification, Ramdorai and Herstatt (2015, p. 27) state that companies continuously develop their products further and aim to grow their market share within mainstream customer needs. The core focus of the incremental approach is to improve the product within the established customer segment and the performance dimensions of existing products. Conversely,

disruptive innovations appear inferior to mainstream market customers. The novel products appear attractive only to a limited market that is also called a niche segment. The attractiveness to the customer is provided by better performance that addresses specific needs which are not satisfied by the mainstream market.

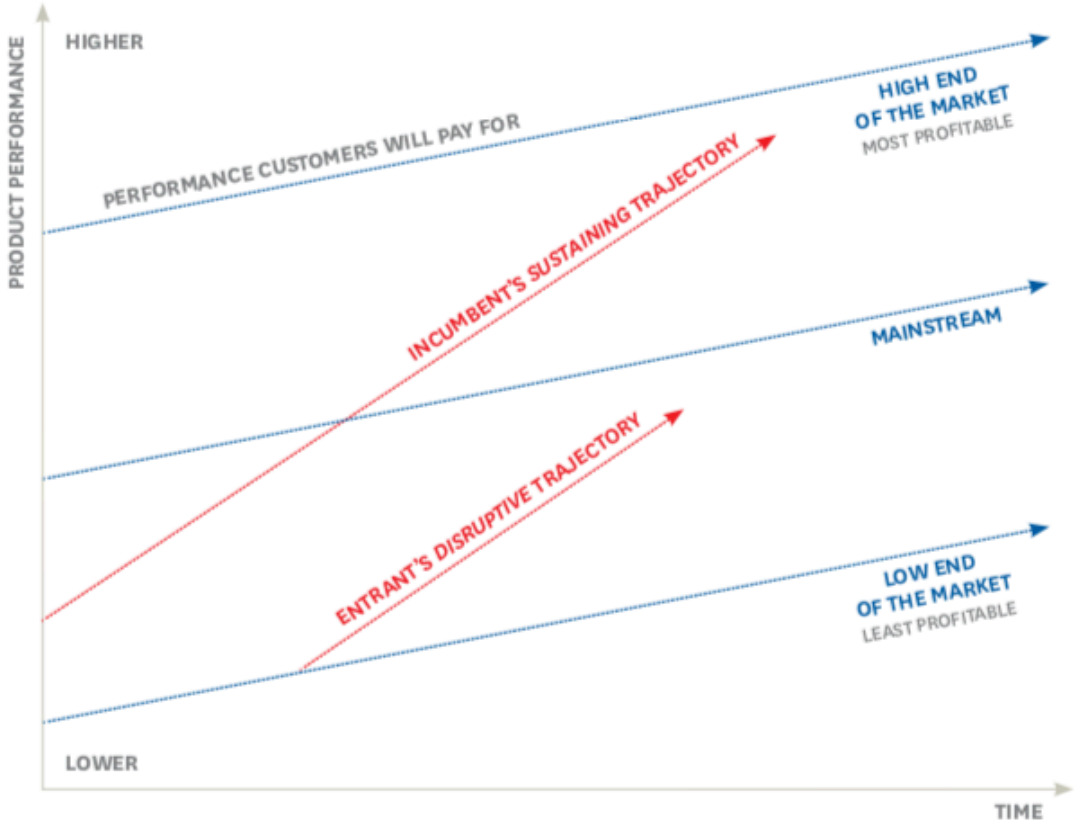


Figure 3: The Disruptive Innovation Model
Source: Christensen, Taynor, & McDonald, (2015)

One of the crucial underlying reasons why customers switch to new products is performance over supply, as Christensen (1997, p. 144f) claims. It determines the reasons why customers adapt to market disrupting products, even though better developed solutions are available on the market. This means that in addition to new potential market entrants, the competitive structure changes. Furthermore, the decision-making process of customers changes, signaling that products emerge through the life-cycle. Figure 3 depicts this concept, as initially developed by Christensen (1997) and further developed in 2015. Christensen (2015, p. 7) highlights that his diagram contrasts on the product performance trajectories versus those of the customer expectations. As established market players focus on quality and service development (upper red line) to meet the needs and desires of customers, they overshoot the needs of customers in the low-end and those of the

mainstream. This opens the door for market entrants to establish in neglected market segments. Companies who develop along the “entrant’s disruptive trajectory” (lower red line) also focus on product and process improvement. This results in improved performance and lets the company move upmarket. Based on this development, probability grows and the incumbent faces growing competition in the mainstream market.

Based on the basic findings from Christensen and fellow researchers of the concept of disruptive innovation, there is still interest by the research community on this topic as in proven by various articles and developments. Govindarajan and Kopalle (2006, p. 13 f) take on the previously findings and expand the concept by adding the disruption type “high-end” to the model. In their opinion, such disruptions are interconnected with innovation that affects the high price segment rather than the mainstream. Similar to original factors, Govindarajan and Kopalle (2006, p. 14) claim that the neglection of customers with high expectations can also attract new technologies and market entrants. The approach of Adner (2002, p. 686) pursuits a different approach. In the article, he analyses disruptive innovations through the eyes of a demand-based view. In this regard, he claims (2002, p. 686) “that the demand landscape shapes the opportunity structure that firms face and affects individual firms’ incentives to innovate. Firms’ innovation activities, in turn, affect customers’ expectations and through these expectations, the demand environment faced by firms.” This means that disruptive innovations need to provide satisfactory performance and significantly lower price to succeed. Markides (2006, p. 19) approach contradicts from the previously described ones. He states that disruptive innovations cannot be described as one unit and that Innovations are highly specific and competitive effects act on different market levels. Therefore, he suggests a separated treatment of technological, business model and new product innovation. Based on this analysis, Table 1 (next page) provides an overview of key characteristics of disruptive innovations.

Besides the additionally research conducted on that topic (Adner, 2002; Govindarajan & Kopalle, 2006; Markides, 2006) and the high acceptance to the theory of Christensen and Brower (1996), noticeable criticism is raised in literature by Danneels (2004) and Tellis (2006) among others. Danneels (2004, p. 249) defines disruptive technology as “a technology that changes the basis of competition by changing the performance metrics along which firms compete.” Additionally, he states in this context that the drive for satisfying needs influences the way how decisions are made. Christensen (2005, p. 11) states that disruptive technologies “are typically cheaper, simpler, smaller, and frequently more convenient to use.” For Danneels (2004, p. 249) questions remain unanswered as the study does not evaluate essential and ancillary characteristics. Even though Christensen and Brower (1996) elaborate on their findings by the presentation of examples a fundamental and in-depth empirical analysis is missing as Tellis (2006, p. 35) alleges.

Author, Journal/Book	Characteristics
Christensen (2005, p. 11) Book: The Innovators Dilemma	Disruptive technologies underperform in established mainstream markets and is typically simpler and at a lower cost
Christensen and Raynor (2013, p. 65) Book: The Innovators Solution	Disruptive innovation can create new markets, as it attracts people who previously lacked the resources or skills to use it
Govindarajan and Kopalle (2006, p. 14) Product Innovation Management (A)	Disruptive innovation can involve radical technology and attract high-end customers
Markides (2006, p. 19) Product Innovation Management (A)	The disruptive innovation takes a significant share of the mainstream market

Table 1: Characteristics of disruptive innovation
Source: Ramdorai & Herstatt (2015)

3.1.1. Disruptive Business Imitation

Disruptive imitation is distinguishable from disruptive innovation. Eckert (2018a, p. 9) defines it as a downstream copy or imitation of an original novel product or process which is more or less the same as the original introduced to the market at a later point in time. Valdani and Arbore (2007, p. 199) even expand this argument when they highlight that imitation is not limited to the product. Imitation can also appear on the strategic, organizational as well as the procedural level of successful concepts. However, the authors Valdani and Arbore (2007, p. 200) accept that the most basic form appears on the product level, as specifications and qualities are accessible to outsiders compared to internal processes as insights are difficult to obtain. Bloching et al. (2015 p .9) highlights with regard to the digital transformation that the digital change induced a significant shift in the value creation as manufacturing platforms and standardization increases performance. For incumbents, this means that market entrants with better internal performance threaten the existing business model. Valdani and Arbore (2007, p. 199) identify several ways in which imitation appears on the market, as shown in Table 2.

Mode	Description
Clones	Clones are legal copies that imitate an original product but are sold with a different brand name, as a result clones can be sold at a significantly lower price or with added quality to the imitated product.
Marginal Imitations	Imitations of products often appear on the market with slight changes only. This involves the application of new materials or new approaches in the manufacturing process that significantly increase performance.
Incremental Imitation	In an incremental imitation, the imitator captures a market by overtaking the existing pioneer innovator within a technology.
Creative Imitation	In this case, imitators apply significant changes to the concept in order to create a new application of the original product. It aims to attract new customer segments or the entrance of new market segments.

Table 2: Types of disruptive imitation
Source: Adapted from Valdani and Arbore (2007, p. 199 f)

In the context of disruptive imitation Eckert (2018a, p. 10) puts a strong emphasis on the role of the innovation leader. Answering the problem highlighted by Bloching (2015, p. 9), Eckert (2018b, p. 10) sees incumbent companies still have an advantage as the pioneers on their side. The advantage in knowledge provides clear advantages in process design and leads to a higher degree of cost efficiency.

Even though Eckert (2018a) and Valdani and Arbore (2007) try to draw a holistic picture, essential questions are left unanswered. The problem raised by Bloching (2015) is in particular left out of the discussion. Furthermore, the available literature and research is scarce and requires further investigations with particular focus on change paradigms due to digital transformation within companies and markets.

3.1.1. Hyper Competition

The US management researcher Richard A. D'Aveni (1994, p. 163f) developed the theory of hyper-competition, a growing dynamism of competition as incumbent companies face new competitors entering the market. Additionally, digital transformation is promoting this dynamism. Eckert (2016, p. 1) notes the connection to digital transformation as he identifies increased development speed and the reduced lifespan of competitive advantages. The findings of Sammut-Bonnici (2015, p. 1) combines the important dimensions of hyper-competition. She claims that hyper-competition is promoted by the increased number of competitive strategic maneuvers within an industry and the resulting need for rapid strategic response of market participants. Furthermore, strategic decision making is highlighted as Sammut- Bonnici (2015, p. 2) puts the spotlight on to strategic aspects as hypercompetitive markets require a rapid tactical response. This might be achieved by the introduction of new products and business models.

Roland Eckert (2017, p. 2), who conducted extensive research on hyper-competition, adds that incumbents cannot rely on sustainable competitive advantages anymore as competing companies continuously and repeatedly attack the core competencies which eventually results in a loss of advantage. As a consequence, companies need to be prepared for the increased competition as advantages on the market are only sustainable for a limited amount of time. In other words, this means that market participants are required to disrupt the market actively. Bailom et al. (2007, p. 4) affirm the previously elaborated on basic understandings and add the findings of effects due to the growing price-quality competition. The market dynamism forces companies to constantly innovate products and develop the quality compared with a significant devaluation of margins. Matzler et al. (2009, p. 6) agree on the already discussed findings, however they add to the discussion that intense competition increases transparency. In the long run, this leads to a reduction of switching costs and further aggravation of the competitive situation within the industry.

Bailom et al. (2007, p. 7) show in an example the challenging effects and the reasons how markets get out of balance. As the market participants try to increase market share and follow tit for tat strategies, companies are forced to increase quality and accept a lower price. Matzler et al. (2009, p. 6) take on these findings and see the danger of a downward spiral. Especially (1) over capacity, the (2) limitation of opportunities for differentiation with long term and significant effects and (3) growing market transparency promote the acceleration of the spiral. Nevertheless, Matzler et al. (2009) show that though competition has always existed, the overwhelming pressure and speed creates new challenges for market participants.

3.2. Technology

Lassi et al. (2014, p. 239) focused their research on the developments of digital transformation in the manufacturing industry. They highlight the pressure for technological adoption as a driver for digital transformation. The ex-post view of the paper shows that technology has ever since been the basis for revolutions in the industry. Heilig et al. (2017, p. 234) provide in their paper insight into the development of growing IT influence on the example of logistics and identified that three stages of relevant technological development occurred. The three changes included the introduction of paperless procedures, automated procedures and smart technologies.

Within the paradigms of the latest industrial revolution, Lassi et al. (2014, p. 239) see the aforementioned pressure for adaptation and high expectations of customers growing. The research group identifies therefore that triggering factors such as (1) shortened development periods, (2) on demand individualizations and (3) the need for resource efficiency push the introduction of technology in the Industry 4.0 context. In this sense, also the research team Fitzgerald et al. (2013, p. 4) highlight the fast pace of technological change and its effects on the business landscape. Schwertner (2017, p. 390) adds to the discussion that traditional original equipment manufacturers (OEM), as well as their suppliers and retailers, are affected as new technologies actively change value chains and enable new business entrants. Regarding the rapidly changing business environment, Whangthomkum et al. (2006, p. 32 f) state in this context that companies in such a business environment are forced to adapt to stay competitive. Additionally, Fitzgerald et al. (2013, p. 5) highlight the importance of quick and effective decision making in technology induced transformation environments. A detailed insight into the firm level unveils the perceived threat of endangering the business with the introduction of new technologies and underperformance due to missing employee skills.

Technology is among the drivers of digital transformation and builds the basis for development as Lasi et al. (2014) show. However severe criticism is raised from the strategic management research stream (T. Hess et al., 2016; Kane et al., 2015; Matt et al., 2015; Singh & Hess, 2017; Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2012a) as well as the disruptive technology research stream. (Christensen & Bower, 1996; Paap & Katz, 2016; Ramdorai & Herstatt, 2015)

Matt et al. (2015, p. 339 f), who follow the strategic management research stream, highlight the benefits that new technology provides, and also see that a broad number of companies test technologies within the whole organization. However, they state that a successful transformation is built on the pillars of strategy, and not on those of technology. Kane et al. (2015, p. 5) provide with their empirical study insight into the management level of companies. They emphasize that

companies who are only driven by technology but forget to adopt the culture and internal organization are more likely to fail in transformation efforts. Westerman et al. (2012a, p. 9) interviewed manufacturing industry leaders on the perceived source of pressure for digital transformation. Almost 72% of the respondents think that competition is the primary driver that forces companies to adapt, technologies itself have only a minor role in this regard. Therefore, Hess et al. (2016, p. 124) explicitly state that “a clear strategy for developing and exploiting digital technologies is crucial for the future business success.”

The supporters of disruptive technology research agree that technology is not a key driving factor. From their point of view, the market and customer expectations are the most critical factors (Christensen & Bower, 1996; Paap & Katz, 2016; Ramdorai & Herstatt, 2015). Adner (2002, p. 23) highlights the shift in customer expectations. He states that “technology disruption occurs when, despite its inferior performance on focal attributes, the new technology displaces the mainstream product”. Adner (2002, p. 668) justifies his argument with the findings of Christensen (2005) as he highlights that a change in technology occurs when the performance provided and the performance demanded trajectories intersect. Paap and Katz (2016, p. 16) agree and recognize that a transition to another technology occurs only then when (1) customer needs are unmet, (2) a promotional factor for transition exists and the (3) existing technology cannot provide sufficient productivity. Furthermore, Paap and Katz (2016, p. 17f) notice a hesitant search for new technologies, to stay ahead of competition. In this context, disruptions in industries occur based on neglected change signs and misunderstanding of customers. Moreover, as soon as the limit is reached and customers become unsatisfied with the performance level, a change to new performance benchmarks occurs. Figure 4 depicts the change from the old performance driver to the new one. In this case, “the dominant driver in a market segment matures and the customers shift to another ‘lower order’ need to drive their purchase decisions. Moreover, the old technology cannot competitively address the new driver.” (Paap & Katz, 2016, p. 18)

De Mattos and Laurindo (2017, p. 45) as well as Iacovou et al. (1995) found in their empirical studies that the selection of new technologies, which become implemented in the company, is highly influenced by business partners along the supply chain. The researchers emphasized the pressure from outside the company as business partners are expected to integrate and adapt to new paradigms of partnership. In this regard, the selection process of suitable technology is essential.

Concerning the selection process for new technologies, two theories receive the most significant attention in literature. On the one hand, Rogers’ (1995) diffusion of innovation and on the other the TOE framework from Tornatzky and Fleischer (1990). For the research aim of this thesis, these

theories are identified as relevant as they help to connect the external influence of changing technologies to the development of digital transformation strategies on the internal level and provide an example of a filter for transformation tool selection.

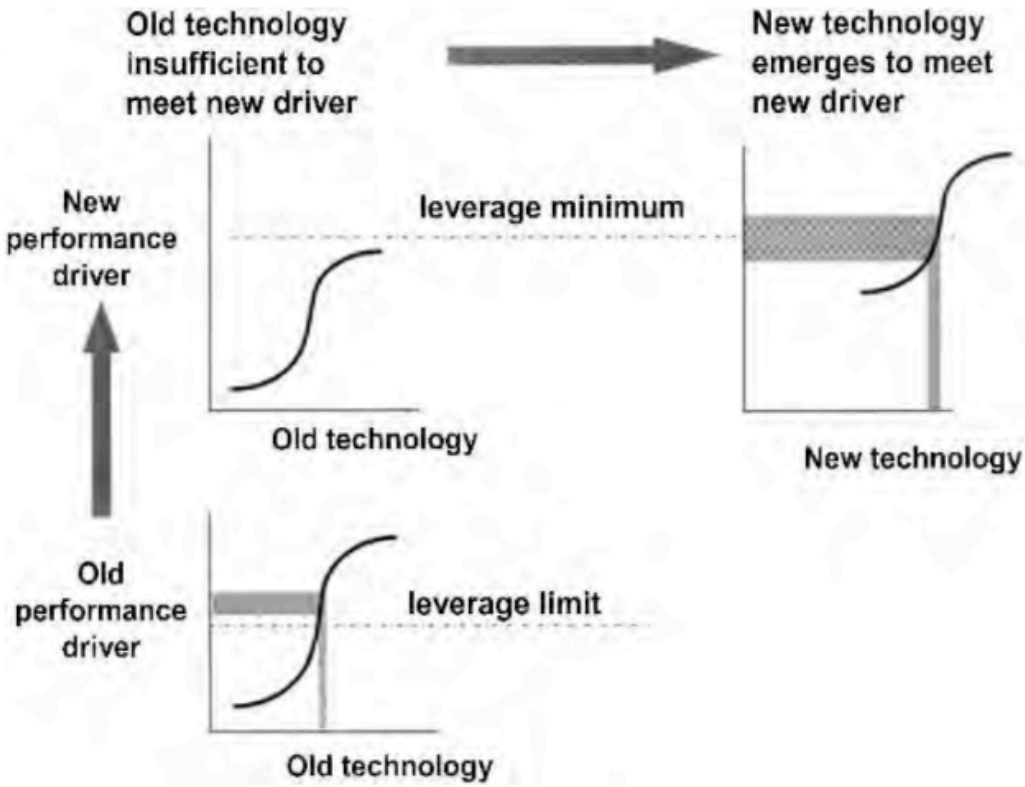


Figure 4: Change of technological drivers along the s-curve
Source: Paap & Katz (2016, p. 18)

The theory diffusion of innovation by Rogers (1995) deals with the pace of innovation spread. The theory is based on the s-curve model which describes an ideal path of distribution on the market and the classification into the stages of critical development points such as tipping point, timing of the plateau and extent of diffusion (Johnson et al., 2017, p. 326 ff). For the selection process of technologies of companies, Rogers (1995) identifies five critical stages. Zhu et. al (2017, p. 602) describe them as: (1) the relative advantage which an introduction of a new technology provides to the company, (2) the degree of compatibility to the existing technological and organizational structure, (3) the required technical skill level for implementation, (4) the observability to others of innovativeness and (5) new value and finally the difficulty of testing and implementation a proof of concept.

The TOE framework by Tornatzky and Fleischer (1990) follows also the goal to facilitate the selection process for technological implementation. In comparison to the framework from Rogers (1995), the TOE framework is built on three layers. Zhu et. al. (2017, p. 604) highlights the

interdependency of the dimensions and describes the first critical dimension as (1) the internal available skill level for adaptation, (2) technological fit in context of size and structure and (3) environmental influence from competitors and business partners.

3.3. Summary

The chapter drivers of digital transformation analyzed the influence of external and internal promotional factors for digital transformation. The changes in the market identified, show that digital transformation changes the value expectations of customers, value creation and intensifies the competition among market participants as the life-cycle of products becomes shorter (Christensen & Bower, 1996; D'Aveni, 1994; Eckert, 2018a). Also, the investigation into the influence of technology showed that it has only a secondary role among the drivers of digital transformation. The management research stream argues that only a specific transformation strategy makes a successful transformation possible and that the change has to be executed throughout the whole company (T. Hess et al., 2016; Matt et al., 2015; Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2012a). The researchers from the diffusion of technology research stream highlight the change of values, customer needs and customer expectations as a reason for technological change and a resulting digital transformation (Adner, 2002; Christensen & Bower, 1996; Paap & Katz, 2016). However, the selection of adequate technologies is critical for the future success of a company, as the frameworks of Rogers (1995) and Tornatzky & Fleischer (1990) show.

4. Formulating a Digital Transformation Strategy

"Strategy, not technology drives Digital Transformation" is a statement from Kane (2017, p. 1) which puts the previous arguments of external promotional influence of technology on digital transformation together. In this regard, the strategic approach gains by far more attention as the researchers Hess et al. (2016), Matt et al. (2015) and Bharadwaj (2013) show among others.

As Bharadwaj et al. (2013, p. 472) and Matt et al. (2015, p. 339) highlight, requires Digital transformation an integration throughout all the departments across a company and holistic approach in strategy formulation is required. Therefore, this chapter assesses the dimensions of transformation strategy formulation and provides the basic theory of strategic management. In a second stage, it provides insights into special factors of digitalization strategy. Furthermore, critical functional fields are investigated for specific challenges. The findings result in the analysis of strategic opportunities to respond to the digital transformation. The final section of this chapter assesses frameworks for the strategy formulation process and seeks particular implications for digital transformation.

4.1. Dimensions of Strategy

Concerning the definition of strategy, Johnson et al. (2017, p. 2) interpret it as "the long-term orientation of a company." Reisinger et al. (2013, p. 25) add to this definition the desire of a company to successfully execute its mission through a set of adequate measures. Wheelen and Hunger (2012, p. 5) see the purpose of strategic management is to identify external business opportunities and threats in consideration of the strength and weaknesses of a company. Based on this underlying assumption, Wheelen and Hunger (2012, p. 15) present the underlying and in theory accepted process of strategy development. Figure 5 illustrates the process from beginning to the end.

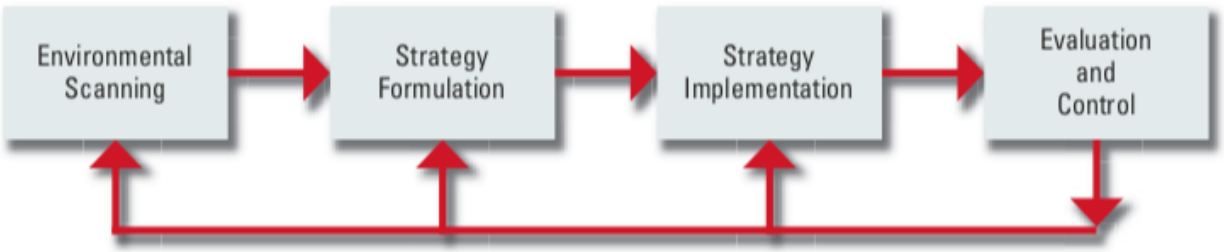


Figure 5: Ideal strategy formulation process
Source: Wheelen & Hunger (2012, p. 15)

In the environmental scanning stage Johnson et al. (2017, p. 33) highlight the opportunities and threats that influence the company from the outside. In their eyes, environmental scanning consists of broad environmental factors that impact to a greater or lesser extent many organizations, industries and sectors. Hereof, Reisinger et al. (2013, p. 54) point out the relevance of environmental scanning as for rational decision-making, relevant information has to be identified and brought into context in order to understand the complexity of the economic surroundings of the company. Wheelen and Hunger (2012, p. 16) suggest in this regard the analysis on the (1) internal level, (2) task environment which assesses stakeholder interests from outside the company, and (3) societal environment forces such as technological change, changes in the business environment or sociocultural influence streams. Johnson et al. (2017, p. 34) identify the commonly used PESTEL Analysis as an well suitable tool for conducting a holistic analysis of the company's economic environment. Units of analysis are: (1) political influence factors, (2) economic factors, (3) socio-cultural factors, (4) technological change (5) environmental issues, as well as (6) legal factors. The previously listed factors show that environmental scanning includes not only market related but also non-market related factors.

The second step in the strategy development process is strategy formulation. Wheelen and Hunger (2012, p. 17) understand this strategy formulation as the long-term development of structured decisions for an effective and planned management of the organizational environment and the company's capabilities. This stage also includes the development of a company mission which describes the purpose and vision specifying what the company wants to achieve. Mills et al. (1995, p. 17 f) allude to the details of the strategy formulating process by introducing the categorization of strategies. They identify strategies on the (1) corporate level, (2) business level and (3) functional level. Wheelen and Huger (2012, p. 19 f) give meaning to the dimensions as they understand the corporate strategy as the basic outline of the overall goal in light of the desired growth and the approached management of its products. The business strategy effects decisions one level beneath the corporate strategy. Typically, this type of strategy affects the business at the product level. The focus is on the development of the competitive position of the company and the product. However, it has its boundaries within the market segment or industry. The functional strategy works on the lowest level and describes the business unit objectives and strategies in order to maximize the productivity of invested resources. This level focuses on maintaining and expanding the unique selling proposition.

The third stage of the previously presented model is strategy implementation. It involves the implementation of developed (1) programs, (2) budgets, and (3) procedures. The implementation process might lead to significant changes in the corporate culture, structure or management

system within the whole cooperation (Wheelen & Hunger, 2012, p. 21). For a successful transition, effective change management has to be implemented. Therefore, special attention in Chapter 5 is dedicated to this topic in a digital transformation context.

The final dimension of the proposed model is concerned with the reevaluation of the proposed measures and strategies. It includes the reassessment of previously made assumptions for the strategy formulation process as well as the measures taken for implementation. This process provides feedback and fundamental knowledge of adjustments (Reisinger et al., 2013, p. 42).

The basic assessment of strategy has shown that management research has agreed on a common standard in the strategy formulation process. This proves the findings of the three independent literature works used for assessment (Johnson et al., 2017; Reisinger et al., 2013; Wheelen & Hunger, 2012). Reisinger et al. (2013, p. 42) identify however some limitations including the claim that the proposed model provides a simple and understandable depiction of complex issues, but it in an effort to simplify the model, it leaves certain influences out.

4.2. Digital Transformation Strategy

During the previous decade, a sophisticated research stream developed to investigate the needs of digital transformation strategy as a large number of scholars and a wide variety of research papers show. As there is a large number of researchers and due to the relative novelty of the research field, this leads to many different opinions, definitions and terms. Nevertheless, they can be combined under digital transformation strategy (Bharadwaj et al., 2013; Chi, Zhao, & Li, 2016; T. Hess et al., 2016; Kahre, Hoffmann, & Ahlemann, 2017; Leischnig, Woelfel, & Ivens, 2016; Mithas, Agarwal, & Courtney, 2012; Mithas, Tafti, & Mitchell, 2013; Oestreicher-Singer & Zalmanson, 2013; Pagani, 2013; Woodard, Ramasubbu, & Tschag, 2013).

Mithas et al. (2012, p. 2) were among the first researchers to identify the need to involve developing technology in the strategy formulation process on the corporate as well as the business level. From their point of view, IT enabled transformation influences strategy due to five factors. The primary dimension assesses (1) the disruption potential of technology within a market, (2) the potential of IT to increase the efficiency, (3) new sources for business development, (4) a significant reduction in transaction cost, and (5) enhancement in the decision-making process. Mithas et al. (2012, p. 2) note based on the identified challenges that “digital business strategy should help determine how to manage these five elements, by outlining plans for exploiting the strength of IT, mitigating its threats and using digital uncertainty as a competitive advantage.” Ward and Peppard (2002, p. 40) illustrate the ideas of a supportive IS/IT Strategy. They emphasize

that the information system strategy should be orientated along with the organization's necessary information systems or application set. Additionally, the core focus of the IT strategy effects the technological infrastructure and the development of required skill. In other words, it addresses the "how" dimension. Figure 6 presents the supportive relationship between IS and IT and highlights further considerations.

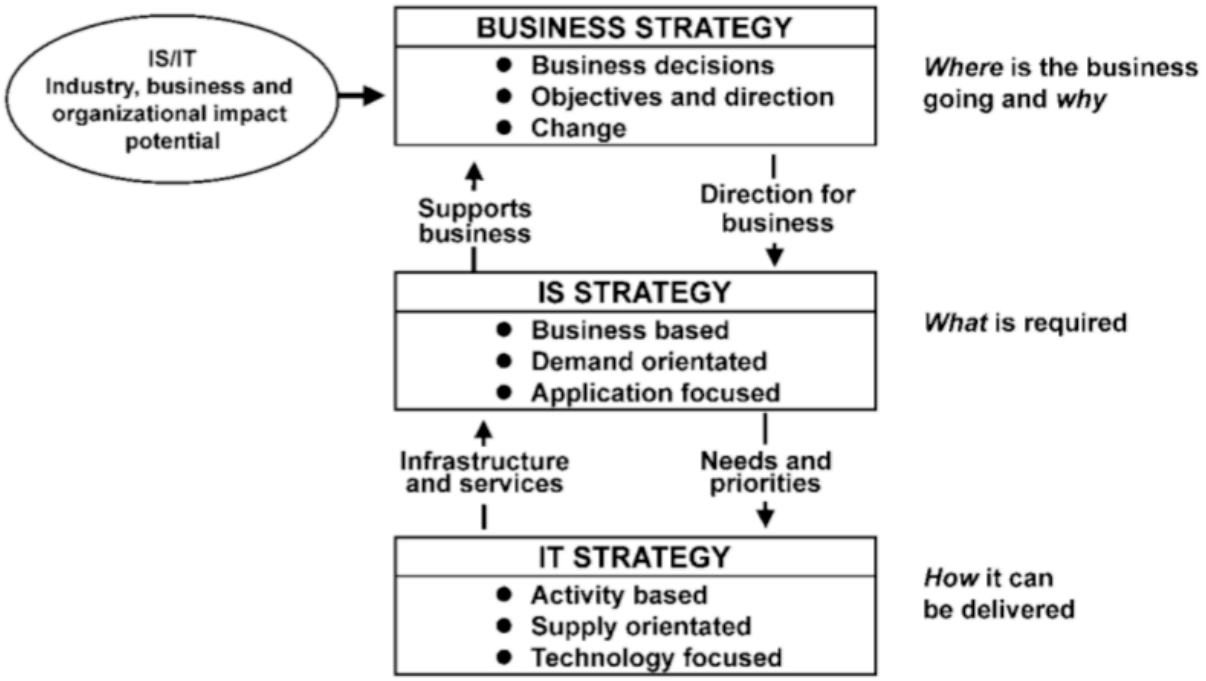


Figure 6: The relationship between business IS and IT strategies
Sources: Ward & Peppard (2002, p. 41)

Bhardwaj et al. (2013, p. 47) state in their article that the time has come to reevaluate the role of IT strategies. They demand to bring IT decisions from the functional level to a combination of IT and business strategy into a holistic planning approach. They call it digital business strategy in which Bharadwaj et al. (2013, p. 472) define digital transformation as an "… organizational strategy formulated and executed by leveraging digital resources to create differentiated value". Bharadwaj et al. (2013, p. 472) see in this definition as the requirement of broadening the traditional view and assign digital transformation efforts away from IT to a more strategic approach. Since the addition of systems and technology without a detailed plan limits the overall transformation success. Mithas et al. (2013, p. 513) disagree with the findings from Bharadwaj et al. (2013) as Mithas et al. (2013, p. 513) define digital business strategy as "the extent to which a firm engages in any category of IT activity." Furthermore, they identify "key building blocks for how digital business strategy emerges as a result of the interplay between a firm's digital strategic posture and industry environment." The presented research results suggest that companies need to consider IT as an

important dimension for shaping the business strategy itself. Therefore, the research group suggests a dynamic synchronization to develop a competitive advantage.

Woodward et al. (2013, p. 538) sees the need for a combined IT and business strategy and therefore agrees on the findings by El Sawy from 2003. Woodward et al. (2013, p. 538) highlight in this regard that deciders have to evaluate such technology issues from a new perspective. They introduce the term “the fusion view of Information Systems.” This terminology understands IS as embedded and integrated into the product and offerings of the company. For this reason, Woodward et al. (2013, p. 538) define digital biasness strategy “… as a pattern of deliberate competitive actions undertaken by a firm as it competes by offering digitally enabled product or services.”

Chi et al. (2016, p. 87) state in this regard that “digital transformation strategy is one kind of organizational strategy, which formulated and executed by leveraging digital resources to create differential value.” The considerations of Chi et al. (2016, p. 87) stress three relevant features: (1) digital transformation strategy is influenced by digital technology, (2) digital strategy is not a functional-level IT strategy, meaning that for successful implementation, the strategy has to be introduced on the business or firm level, and the final argument emphasize (3) the potential for significant value development for the company through digital transformation.

The findings of Hess et al. (2016, p. 124 f) confirm the arguments of Bharadwaj et al. as they claim that a successful transformation requires a holistic strategy for successful exploitation of digital technologies and the long-term survival of the company. Nevertheless, they identify still an arguable degree of uncertainty between digital, business and IT strategies as some argue that digital transformation is located on the IT level whereas others see the need for integrating the issues on higher rank levels.

Kahre et al. (2017, p. 4706) pinpoint the recent forthcoming of digital business strategies and postulate the need for a combination of business and IT strategies as a prerequisite for developing an innovative environment to maintain the competitive advantage. Kahre et al. (2017, p. 4711) emphasize in their conclusion the significant growth of research attention to the environmental and organizational conditions, starting mainly from 2010. Furthermore, they claim, based on their literature research, that recent publications aim beyond the basics of business-IT orientation. In worst case scenarios companies become unable to align strategies of all scopes within the company will fail to benefit from digital opportunities. Matt et al. (2015, p. 340) underline the influence of digital technologies throughout the whole company and the effects beyond the borders of products and processes. Figure 7 depicts the far-reaching scope and the broadly reaching

consequences of digital transformation strategies that seek to align and prioritize the many independent threads of the transformation efforts. The findings of Matt et al. (2015, p. 339) point out the differences and limitations of IS/IT orientated research as they stress that IT strategies typically are limited to the management of IT infrastructure, with limited influence on innovation.

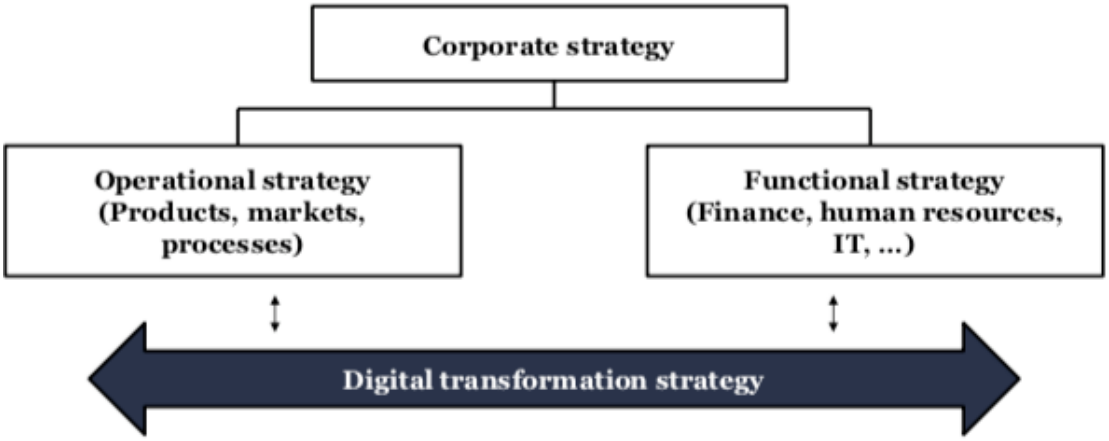


Figure 7: The relation between digital transformation strategy and other corporate strategies
Source: Matt et al. (2015, p. 340)

The comparison of the proposed statements from the researchers shows a clear progression over time and increased research interest in that topic. In 2012, Mithas et al. (2012, p. 2) understood a digital transformation strategy as a supporting entity while more recent approaches note the importance of full integration of digital issues in the business strategy formulation process (Kahre, 2017, p. 4711). The most accepted approach for digital transformation is the concept of fusion from IT strategy and business strategy. Chi et al. (2016), Woodward et al. (2013) and Bharadwaj et al. (2013) emphasize the importance of a holistic integration of digital challenges throughout the whole company in order to create collaboration capabilities and to improve the overall performance. The previously identified definition of Bharadwaj et al. (2013, p. 472) gained significant attention within the research stream as a significant number of papers use this concept as a basis for further research. (Chi et al., 2016; Kahre et al., 2017; Leischnig et al., 2016; Oestreicher-Singer & Zalmanson, 2013; Pagani, 2013).

4.3. Transformative Considerations

The previous elaborations on digital transformation showed that the change and adaptation to new market needs affect the company as a whole. Therefore, proactive decision making, and strategic considerations have to be made on the functional level. In this sense, the following chapter aims to highlight challenges and requirements for a successful transformation on the dimension of managerial, organizational, and structural level.

4.3.1. Managerial Considerations

Fitzgerald et al. (2013, p. 6) identify that companies still struggle with profiting from the digital transformation due to ineffectiveness on the management level. Furthermore, empirical research claims that managers feel no urgency to drive digital transformation forward. Also, Fitzgerald et al. (2013, p. 7) note that complacency affects more companies than any other managerial obstacle presented in the study. As almost 40% of research participants answer that no burning need and a lack of urgency are the main hindering factors. As a solution, the research paper highlights the importance of managerial commitment and the importance of a communicated company vision. Kreutzer et al. (2018, p. 47) understand the vision as an organization-wide strategic objective. It provides a general basis for business activities in the future. They highlight the importance of a good vision, during transformation processes. Westerman et al. (2015, p. 100) argue regarding digital transformation that the key for success has to emerge from the top management of a firm. The C-level is obliged to create a convincing vision as to how the company should look like in the future. Furthermore, the top managers are in the position to communicate to the middle and lower levels, who bring the vision into reality. Fitzgerald (2013, p. 7) agrees with the approach of Westerman et al. (2015) as the basis for digital transformation is a clearly formulated vision by the top leadership team. Moreover, the research results prove that digital transformation is a management task. In companies, where the transformation vision was clearly communicated, more than 93% responded positively to digital change within the company (Fitzgerald 2013, p. 7). Bouée and Schaible (2015, p. 33) are in line with the findings of Fitzgerald et al. and Westerman et al. and add that there is a need to focus on the integration on all hierarchy levels and show that every employee has an important role in making the transformation successful.

In order to analyze the underlying effects of managerial influence on digital maturity, Westerman et al. (2012b, p. 3) conducted extensive research. Their proposed four quadrant model classifies industries into groups of different maturity. One level of assessment is digital intensity which measures the technology-enabled initiatives of internal operations as well as on customer engagement. At the same time, the model assesses the intensity of digital transformation management. The second dimension analyzes the management and leadership capabilities which

are necessary for the digital transformation. It includes a (1) clear vision of the future, (2) adequate corporate governance and engagement to guide the direction, and (3) the relationship of IT and business to implement transformative technology. Based on the findings of digital maturity, Westerman et al. (2012b, p. 3) point out the interdependency of management intensity and digital transformation. Consequently, a combination of top-down guidance and bottom-up innovation drives digital transformation. However, slow decision making and conservatism prevents companies from further development. Kane et al. (2015, p. 14) take on the concept of digital maturity and state that companies who obtained a higher degree in digital maturity behave and act significantly different than competitors with lower levels. Market participants who reached already a certain degree of maturity have a different focus than their peers as innovation and decision making are integrated and therefore promotes transformation. Kane et al. (2015, p. 15) release managers from the burden to be a technology expert, but they highlight that an understating of potential benefits of digitization has to be obtained to understand the interdependence of technology and business. However, a clearly defined task for the management is to act as a role model and lead the way so the business can transform. In this regard, Westerman et al. (2015, p. 177) emphasize the relevance of the scale and pace of digital transformation and the importance of adequate managerial decision making that protects the existing company while at the same time drives digital transformation.

4.3.2. Organizational Development

Digital transformation causes significant development needs and a holistic solution on the organizational level. Therefore, research literature points out two fields which need special attention. On the one hand researchers highlight the need for adaptation on the C-level and therefore argue the benefits and tasks of a Chief Digitalization Officer (CDO) (Betchoo, 2016; Horlacher & Hess, 2015; Singh & Hess, 2017; Tumbas, Berente, & Brocke, 2017; Walchshofer & Riedl, 2017). On the other hand, the imposed challenge of digital transformation influences the development of corporate culture and the long-term retention of highly skilled employees, as literature shows. (Buchanan, 2016; Goran, Laberge, & Srinivasan, 2017; Kane et al., 2017)

Singh and Hess (2017, p. 1) found in their research on organizational development that successful change requires the introduction of Chief Information Officers (CIO) in companies. For clarification, Walchshofer and Riedl (2017, p. 326) describe the current position of a CIO as a management position that is concerned with the strategic management of technology supported business processes. The core focus of the position is orientated towards cost reduction and the development of an up to date IT infrastructure. Horlacher and Hess (2015, p. 5126) agree on the

findings of Fitzgerald et al. (2013, p. 6) that the digital transformation requires a broader mindset as there is a significant difference to previous transformations. They emphasize that CIOs need to extend their responsibilities from technology-oriented tasks to more strategic orientation. For Singh and Hess (2017, p. 1) this means that CIOs "need to spend less time managing IT services and more time delivering broader business value."

In the search for understanding the responsibilities of a CDO, Horlacher and Hess (2015, p. 5126) underline the novelty of research on Chief Digitization Officers. Even though more and more CDOs are installed in management boards, detailed research lags behind. Nevertheless, the initial research results attempt an allocation of tasks. In this respect, Horlacher and Hess (2015, p. 5134) claim that the CDO is responsible for strategic aspects of digital transformation including its development and implementation and the communicative aspects as well as the management of potential resistance. Whereas CIOs are in charge of technological aspects. Furthermore, the research findings show a certain degree of interdependency but a clear distinction of responsibilities. From the understanding of Friedrich et al. (2015, p. 5) CDOs are in charge of managing digital transformation as a whole. This means that the digitization officer is held responsible for the technological infrastructure and data management. Additionally, the organizational change, as well as the cultural change, has to be managed to ensure that transformation efforts are in line with value expectations of customers. In a more recent search for a definition, Singh and Hess (2017, p. 3) find a contradicting solution to Friedrich et al. (2015). Based on their findings, a CDO should be distinguishable from other C-level managers and is in charge to orchestrate the digital transformation of a company. Additionally, the CDO should enjoy cross-department authority, meaning "the CDO fosters cross-functional collaboration and mobilizes the whole company across hierarchy levels." (Singh & Hess, 2017, p. 3).

The connection of the findings in the chapter 3.2 prove the importance of a CDO. As Fitzgerald et al. (2013, p. 7) highlight among other researchers, the importance of a well-designed and communicated digitization strategy, the CDO is the one who is in charge of execution, promotion and communication.

The second issue discussed concerning organizational development assesses the effect of digital transformation on corporate culture and the resulting effects on employees. Kane et al. (2017, p. 12) found in their research that digital transformation leads to a shift in corporate culture. In future, cross-functional teams will become more important and relevant than siloed and rigged operations and company structures. The interconnected goals and incentives connect employees with each other and positively changes the mindset and working styles, which leads to increased agility. Furthermore, Kane et al. (2017, p. 13) understand agility as a prerequisite to overcoming risk

aversion, the basic characteristic for developing a digitally maturing culture. Digitally mature companies encourage their organization to experiment and understand failure as learnings. Goran et al. (2017, p. 1 f) agree on the previous approach and state that “shortcomings in organizational culture are one of the main barriers to company success in the digital age.” The argument builds on underlying empirical research in which respondents have voted culture as the most challenging over IT knowledge issues, missing understanding of drivers factors and lacking talent. Therefore, Goran et al. (2017, p. 4) conclude in favor of creating a cultural environment in which people are encouraged to try things, even though they might fail in the beginning. Additionally, Kane et al. (2017, p. 13) identify a certain degree of reciprocity between digital maturity and the corporate culture. Despite holding managers responsible for creating a digital-friendly environment to reach digital maturity, also digital maturity itself develops the culture further. The research results on this interdependency highlight the development of a virtuous circle that develops digital maturity and culture and vice versa.

Regarding cultural adaptation, Buchanan (2016, p. 7) highlights the challenge of developing a digital workforce. Buchanan (2016, p. 7) pushes the importance of developing culture onto the same level as strategy. However, ignoring this dimension could lead to difficulties in acquiring and retaining top talent. For Kane et al. (2017, p. 13), developing and holding high potential digital experts goes far beyond simple training. The focus should be on an environment where employees can learn continuously and are happy to spend time. As soon as employees feel no development possibilities anymore, the likelihood to leave the company increases. Kane et al. (2017, p. 14) highlight the need for constant revision as the average shelf-life for skilled employees declines. Companies who are unaware of the importance of retaining and developing the digital workforce will face significant troubles as employees will shift to competitors who do so.

4.3.3. Structural Adaptation

According to Hess et al. (2016, p. 132) requires digital transformation adequate structures to meet the specific needs of digital transformation. Reisinger et al. (2013, p. 30) emphasize in their textbook the importance of the organizational structure. They highlight the primary importance of having the right corporate structure for performance and the proposed strategy. The selected company structure should support effective and efficient value creation. In this regard, it has a notable role in the achievement of company goals and represents an important dimension in strategy development as well as in its implementation. Hess et al. (2016, p. 132) identify challenges for C–level management as they have to decide whether to integrate the digitization efforts into existing structures or to develop them separately to protect the core business in case of failure.

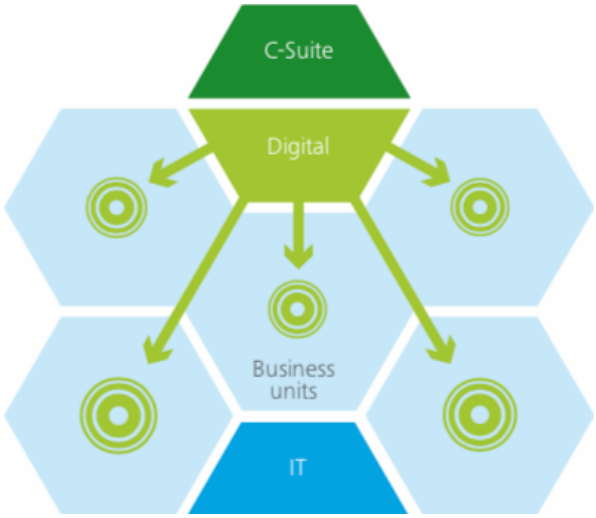
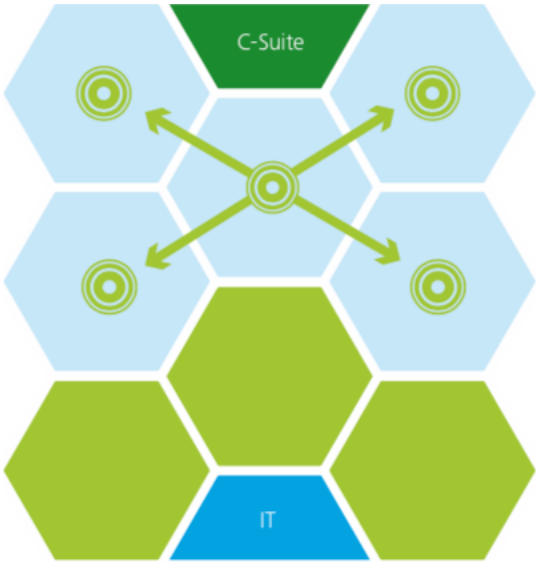
Tactical Model:	
Centralized Model:	
Champion Model:	

Figure 8: Digital organizational structures
Source: Guest (2014, p. 9)

As Figure 8 depicts, Guest (2014, p. 6f) proposes in this context different organizational forms, with particular focus onto the digital transformation. Reisinger et al. (2013, p. 78) draw attention to the crucial pre-requisite of understanding the needs of an organization in terms of structure. Therefore, they present three dimensions to think of in order to assist the selection process for the ideal organizational form: (1) The degree of task specialization, which assess the allocation of tasks, e.g., functional (procurement, production, etc.) or by objective (customer, product). (2) The allocation of power, which regulates the flow of order. (3) spread of power, controls who has the competence in decision making, e.g. centralized or decentralized.

Additionally, Guest (2014, p. 7) identified three traditional models that are commonly used in organization. The first model, the tactical model, works with business units where decision making, operations and the budget are managed from the strategic business units management. The most challenging aspect of this organization form regarding digital transformation is that digital investments are taken only within parts of the company, which hinders a digital transformation throughout the whole company. Westerman et al., (2012a, p. 54) point out the high degree of interdependency as strategy, operations and budget control are managed in the SBU. The second model proposed by Guest (2014, p. 7) is commonly known as centralization model. This organizational form lifts all digital transformation skills and efforts into a central unit, most commonly the headquarters. Such a structure enables companies to approach digital transformation actively. Furthermore, it creates the opportunity that transformation managers actively work together with the SBU's to implement digital strategies and actively change the corporate culture. Westerman et al. (2012a, p. 54) add that only the operational management and introduction is executed by the SBU. For companies which already succeeded in the digital transformation and obtained a relatively high digital maturity degree, Guest (2014, p. 8) suggests the third model, the champion model. In such a company structure, a centralized digitization team is no longer held responsible for driving digital transformation for all activities. Specialized departments develop measures and spread them within the company. The emphasis of such a structure is to share knowledge and educate and support others in the company.

As already mentioned, affects digital transformation companies on multiple levels. In this regard, the developments also influences also the structural design of the company. Kroll et al. (2017, p. 2) emphasize that companies need to be flexible and to be able to adapt quickly to changes in business paradigms. To meet these challenges, the research field and business practice of business agility have developed recently, as a growing number of research papers shows. (Deiser, 2018; Kroll et al., 2017; Mathiassen & Pries-Heje, 2017)

Mathiassen and Pries-Heje (2017, p. 116) take on the recent research trend and state that research on business agility is still scarce, whereas agile development in the IT development sector has already gained notable attention. In an approach to develop a definition Mathiassen and Pries-Heje (2017, p. 116) shed light onto the relevant factors of business agility. They highlight the importance of the ability to react to new marked paradigms quickly, in order to being able to meet the customers needs and even transfer it to the organizational level, which results in flexible and solution based organizational structures. For Deiser (2018, p. 13) agility in company organizations has three different faces: (1) the digital mindset, which requires a high degree of curiosity, courage and the willingness to collaborate of every individual, (2) agile teams, which are built on cross-functional competence and are provided with a large degree of autonomy that even circumvents the formal structure of the company, and (3) an agile organization that manages the design of the company structure in order to meet the needs of the stakeholders in the business environment. According to the researcher, the three proposed dimensions are the basis for a self-reinforcing agile corporate structure.

Kroll et al. (2017, p. 7) agree on the previously identified capabilities of agile business structures. They even state that ignoring this trend would significantly harm the future success of the company. They go on to claim that agile organizations are characterize by a mindset towards change and flexible development. This different way of problem-solving enables cooperations to respond and react quicker to external threats. Additionally, organizations profit from the internal fostering of responsiveness, learning and resilience at the same time. Start-up companies are very good at incorporating these learnings and can therefore adapt very quickly, whereas large firms are hindered by internal hierarchy and bureaucracy. Based on these findings defines Kroll et al. (2017, p. 8) corporate agility as the “company’s ability to sense and respond to change adequately and in due time.” In terms of structure, these findings require a concurrent top-down and bottom-up working approach to implement agile working methods into the company’s DNA. This is the basis for a collaboration of the top management and the employees to adopt the corporate culture and workflow. (Kroll et al., 2017, p. 23)

4.4. Digital Transformation Strategy Types

In order to assess the elaborated considerations in detail and actively address the challenges of digital transformation, general strategic considerations are still valid. In this sense, Johnson et al. (Johnson et al., 2017, p. 210) highlight the interdependence of the generic and interactive strategy selection as well as the basic outline of the business model and its relevance for the basic strategic orientation of the company.

However, in terms of digital transformation, organizations need to develop sets of strategies to successfully adapt to the new paradigms. Literature provides in this regard a vast number of different elaborations concerning the categorization of strategy types for digital transformation. Ross et al. (2017, p. 8) describe in their paper two types of strategies: customer engagement strategies and digitized solution strategies. The core goal of customer engagement strategies is to grow the degree of customer loyalty and trust. For the researchers, an important prerequisite for the execution of this strategy is a seamless omnichannel customer experience, immediate reactions to changing customer needs and a personalized relationship. At the same time, Ross et al. (2017, p. 8) connect digitized solution strategies to the transformation of the product on sale. Furthermore, they state that the strategy “seeks to integrate diversified product and services into solutions, to enhance product and services with information and expertise that help solve customer problems, and to add value throughout the life cycle of products and services.” For the future, Ross et al. (2017, p. 8 f) see significant potential in such an approach as it changes the transactional revenue stream into recurring revenues. The researcher emphasized the number of selected strategies and state that even though touchpoints exist, organizations only succeed when a clear focus guides the way.

Kaltenecker et al. (2015, p. 3) also researched strategies that facilitate digital transformation. Their research took the example of cloud computing and assessed adequate strategies for its implication. The suggestions of strategies are based on the findings of Christensen (1997), who collected the research findings in order to meet the needs to counter disruptive innovations. Hess et al. (2016) add that digital transformation efforts are not limited to come from inside the company and highlights the options to source knowledge from outside the company. Table 3 presents and explains potential sources and strategy types for the adaptation to digital transformation based on the findings of Kaltenecker et al. (2015) and Hess et al. (2016)

Strategy	Description
Company take over	Acquire relevant knowledge by merging or acquiring companies with higher degree of maturity
Partnerships	Joint partnership to gain insight into developments and reduce cost
External sourcing	Recruitment of specialized firms or employees from the outside the company to support and moderate the transformation process
Spin-off	A company entity that exists independently on its own and peruses potentially successful technologies
Trial and error	Active and continuous testing of novel products and technologies, whereas failure is part of the learning process
Step-by-step	Digital transformation by incremental learning - as soon as one project is executed successfully, the next starts

Table 3: Digital transformation strategies
Sources: Own table adopted from Hess et al. (2016, p. 131) and Kaltenecker et al. (2015, p. 13)

4.5. Framework Suggested Transformation Process

The fast pace of paradigm changes in the context of digital transformation led to increased research interest. Both management researchers from traditional research facilities as well as consultancy firms present various solutions to support companies in their digital transformation effort. In addition to analysis of basic paradigms, researchers try to depict the ideal process of digital transformation in frameworks. In order to get insight into the process and being able to develop their own solution, four frameworks were analyzed. (Bouee & Schaible, 2015; Parviainen, Kääroäomem, Tihinen, & Teppola, 2017; Schallmo & Rusnjak, 2016; Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2012a)

The initial comparison and analysis of the digital transformation frameworks prove the relevance of the basic strategy formulation model, as proposed by Wheelen and Hunger (2012, p. 15). Bouée and Schaible (2015, p. 34) address in the primary and secondary stage the analysis of the future and existing paradigms on the industry and corporate level by asking critical questions. For example: “How will the industry look like in the future?” or “How do competitors prepare?” Schallmo

and Rusnjak (2016, p. 13) follow a similar approach and focus on the assessment of the corporate environment. They analyze the (1) digital reality, which analyses the corporate value chain and customer needs, (2) the digital ambition, to identify goals of the company, and (3) the digital potential, which combines takes digital enables into account and assess their applicability. Parviainen et al. (2017, p. 71) see corporate positioning as the primary task where managers have to decide how digital transformation is understood and where the company wants to go. Just, in the second stage, the environment of the company is assessed. For Westerman et al. (2012a, p. 54), creating a digital vision is the starting point as leaders identify the potential value and create a vision for the future. As an essential part of the vision stage, the research group claims the thoughtful diagnosis on which assets become useful in the future. In this regard, a comprehensive look into the assets that are affected by digital transformation is required.

In the strategy formulation section of the framework of Bouée and Schaible (2015, p. 34), the authors emphasized the development of a clearly defined roadmap for digital transformation efforts. As relevant fields for special attention, they identify (1) technological skills, (2) potential strategic partners and (3) the assessment of potential scenarios. Parviainen at al. (2017, p. 73) see in this stage the detailed planning to reach the goal of digital transformation. The model of Schallmo & Rusnjak (2016, p. 13) and Westerman et al. (2012a, p. 52) do not provide detailed suggestions how to formulate the strategy. Nevertheless Westerman et al. (2012a, p. 52) highlight the importance to invest in projects that enhance the vision and the skills of the company and the need to lead the change from the top.

In the next stage, the implementation is assessed. Parviainen et al. (2017, p. 73 f) suggest being careful with the introduction of new technology. In order to protect the business, they suggest starting the digital implementation with proofs-of-concept projects, that provide an environment for testing and learning. Furthermore, they highlight the challenges of change management, as digital transformation leads to significant socio-cultural change. Schallmo and Rusnjak (2016, p. 12) connect the implementation stage to final adaptations to the customer experiences and the value chain network. Bouée and Schaible (2015, p. 34), as well as Westerman (2012a, p. 47), do not provide suggestions for the implementation.

All in all, the research on digital transformation frameworks showed that the quality of available literature is poor and only a small number of adequate papers is available. The comparison to standard literature proved that digital transformation moves along a typical transformation process and none of the assessed models suggested a feedback loop to make reassessments. Based on these findings, the author suggests sticking to standard strategy formulation literature, as suggested in Wheelen and Hunger (2012, p. 15) with a specific focus on digital paradigms.

4.6. Summary

This chapter provided insight into the strategic considerations of digital transformation. The analysis of digital transformation strategy literature shows a significant development over time. The most current research results prove that digital transformation requires a holistic implementation throughout the whole company to be sustainable and effective. (Bharadwaj et al., 2013; Kahre et al., 2017; Matt et al., 2015). In summation, digital transformation requires (1) commitment from the management, (2) the introduction of a C-level manager who is in charge, (3) intensive organizational development of employee skills and (4) a strategic and structural adaptation in order to enable a successful digital transformation. Hess et al. (2016, p. 131) and Kaltenecker et al. (2015) highlight that digital transformation strategies are highly individual to every company. In this sense, the two research groups present different digital transformation strategies that emerge from outside as well as inside the company. Current transformation frameworks suggest, similar to the standard strategy formulation, a process of (1) analysis, (2) formulation, and (3) implementation. Unfortunately, the evaluated models touch the topic only at the surface and leave critical parts like suggestions for strategy formulation or implementations out. For the future, further research needs to be executed that provides detailed insights into the process of digital transformation.

5. Digital Change Management

The previous chapter has shown that digital transformation goes far beyond a functional IT strategy and that the scope of digital transformation involves the company as a whole also in the change process (Matt et al., 2015; Venkatraman, 1994, p. 74; Westerman, Calméjane, Bonnet, Ferraris, & McAfee, 2012a). Kane et al. (2017, p. 11) and Kreutzer et al. (2018, p. 201) highlight change management as a key success factor for digital transformation.

Therefore, this chapter investigates the theoretical foundation of change management to create a basic understanding of change management. Furthermore, the assessment of success factors of change management takes a detailed look at the affected dimensions and pays special attention to digital challenges. Additionally, well reputated change models provide insight into change process as suggested by literature. The final part of this section deals with potential resistance.

5.1. Theoretical Foundation of Change Management

Change management is in literature an intensively discussed topic and a significant number of frameworks and interpretations exist, as Reisinger et al. (2013, p. 174) claim. The literature review of Perscher (2010, p. 10) provides comprehensive insight into numerous definitions. The listing of these definitions groups the presented statements into (1) general, (2) trigger focused, (3) motive orientated, (4) intensity based, (5) motivational, and (6) corporate level oriented definitions. Perscher (2010, p. 13) identifies that all investigated definitions have the focus on time and the development from one stage to the other in common. The intensity and the level of change were in most papers the focus, whereas triggers and motives were underreported. In regard of a definition Vahs (2003, p. 252) interprets change management as ”the target-oriented analysis, planning, realization, evaluation and continuous measures of change in an organization.” Balogun et al. (2016, p. 4) find a different solution and define strategic change management as the “descriptive magnitude in alteration in, for example, the culture, strategy, and structure of the firm, recognizing the second order effects, or multiple consequences of any such change.” In other words, Balogun et al. (2016, p. 4) understand change management as the reorientation of the corporate mission, the underlying purpose and the identification of new targets in order to give new direction to the company. The definition and description provided by Balogun et al. follow a holistic approach. Therefore, their findings are applied as the basic understanding of change management in this thesis.

The previous chapters on digital strategy and changing markets prove the omnipresence of organizational change in the context of digital transformation. The findings of Fitzgerald et al. (2013, p. 4) among others show that the fast technological development forces companies to adapt to changing market paradigms regularly and continuously. From the perspective of change management theory, Vahs (2003, p. 241) identifies that the development of companies and the organizational change are complex to manage as they occur on multiple dimensions and require considerations on the strategic market/product dimension as well as on the level of employee motivation. Therefore, change management in its ubiquity can be categorized into different perspectives. Table 4 below presents the most relevant perspectives of change. Additionally, it showcases how change appears in these contexts.

Perspectives of change		
Source	Internal	External
Premeditation	Planned	Unplanned
Nature of change	Incremental	Radical
End result	Transformation	Realignment

Table 4: Perspectives for change management
Source: Own illustration adopted from Perscher (2010, p. 13) and Balogun et al. (Balogun et al., 2016, p. 23)

Vahs (2003, p. 265) brings motivation to change from the inside into the context of growing pressure to readapt. As an example, bad decision making is highlighted at this point. Beside these “hard” facts, also social conflicts among employees, lead to pressure to change. Perscher (2010, p. 9) agrees mostly onto the findings of Vahs. She states that the center of change on the company level is focused on strategy, structure, internal processes, as well as the corporate culture. Furthermore, the research results emphasize the impact of every individual. As the ability and the willingness of individuals to adapt to change has a vital role in success in change management. On the contrary, external sources for change describe the corporate environment of the company. Perscher (2010, p. 10) allocates market developments and changes in technology to this dimension. Vahs (2003, p. 262 f) also highlights changed marked paradigms as a source for this external pressure on companies, he identifies shortened product life-cycles due to modern value

chain networks and intensified globalization. Also, the research results highlight the influence of values in society. The desire of individuals to live a good life forces companies to adapt to a more attractive corporate culture in order to retain high potential employees.

The second dimension presented in the table above, premeditation, is concerned with the degree of deliberateness of change. Perscher (2010, p. 9) spreads it into pro-active and reactive change efforts. In proactive change, management measures are made actively and on purpose. Everything is planned thoroughly before execution. Pro-active change is therefore commonly executed on a linear time frame and therefore spread into planned work packages. Vahs (2003, p. 241) adds to these findings, the aim of these anticipated and goal-oriented measures is the improvement of effectivity and efficiency. The opposite to actively manage new paradigms and challenges is reactive management of influences on the market or within the company. Perscher (2010, p. 9) identifies in this regard that spontaneous decision making without long-term planning leads to a loss of efficiency. In literature, such behavior is also called “emergent changes”. Differently to the approach of Perscher (2010) and unplanned activities, Vahs (2003, p. 241) sees advantages in reacting to new paradigms, as it gives time to analyze the situation and take measure to recreate previous equilibriums.

Furthermore, Vahs (2003, p. 242 f) splits the nature of change into two different sections. On the one hand, gradual or incremental change, with a low degree of intensity and low complexity and, on the other hand, radical change with a set of complex activities. Moreover, gradual change is built on incremental modifications of internal business processes without changing patterns of the organization significantly. In contrast, Vahs (2003, p. 243) describes radical change as the attempt to realign the organization as a whole. This change mode is from fundamental, radical and qualitative nature. For individuals, such a change leads to a certain degree of uncertainty as such fundamental developments significantly change the established environment. Balogun et al. (2016, p. 25) find content-wise a similar solution but identify big-bang change and incremental development. They understand big bang change as an event in time that occurs all at once or over a short period of time. Furthermore, they describe incremental development as a step-by-step change approach, in which one change stage after the other is accomplished.

In light of the title of this thesis, the next perspective of change is the analysis of the end result. Its aim is to highlight the difference between transformation and simple realignment and assesses the extent of anticipated change. Balogun et al (2016, p. 25) define transformation in this context of change management as “a redefinition of mission and purpose, and a substantial shift in goals, to reflect a new direction and therefore encompassing a fundamental shift in the business model of the organization touching all cultural structural and processual aspects”. At the same time, they

define realignment as a “change to the way of doing things that does not involve a fundamental re-appraisal of the central assumptions and beliefs within the organization, although it may still involve substantial change like a major restructuring.” (Balogun et al., 2016, p. 23)

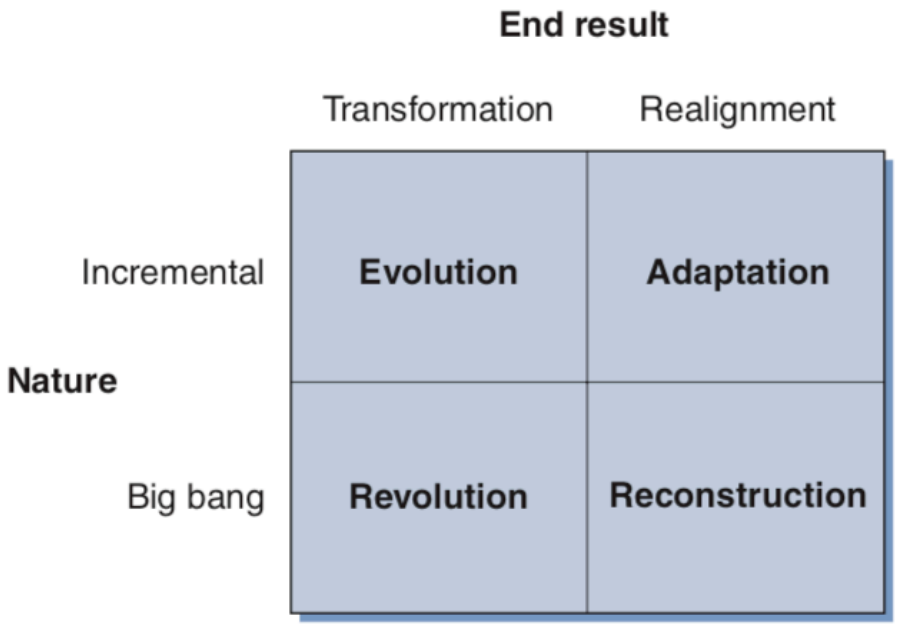


Figure 9: Types of change
Source: Balogun et al., (2016, p. 25)

Figure 9 presents the four modes of change and therefore differentiates strategic change. Balogun et al. (2016, p. 25) depicts the categorization along the axis of speed of transformation and its end result. Reisinger et al. (2013, p. 179) note that the biggest challenge is to manage the fundamental transformation (evolution and revolution), as new ways of thought and work approaches appear on the levels of norms, values, behavior as well as on strategy. If a company faces only realignment strategy, values and working modes stay the same. For employees, this type of change is less complicated as known paradigms do not change (Adaptation and Reconstruction).

Building on the elaborated perspectives of change, triggering measures and activities occur differently from sources within the company. Vahs (2003, p. 323) states in this regard that organizations which reach a specific size and number of employees, cannot involve all individuals directly in the change process from the beginning. In order to successfully integrate and maintain sustainable change, a reasonable starting point for change has to be found. Literature describes in this regard four different sources and execution paths of change: (1) top-down, (2) bottom-up, (3) center-out (4) multiple-nucleus, as the authors Bachert and Vahs (2007, p. 281) Vahs (2003, p. 324) and Balogun (2016, p. 51) state among others.

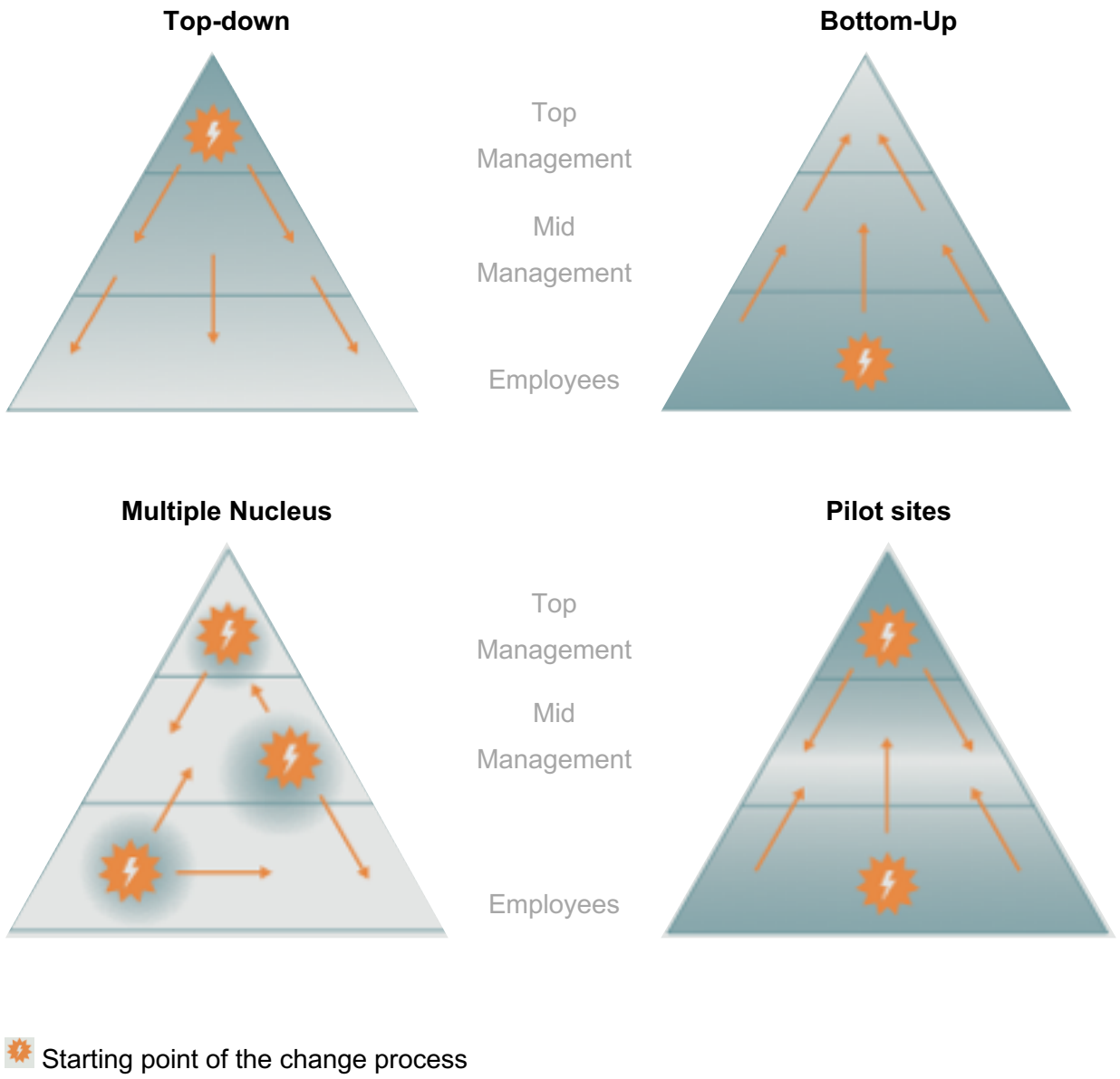


Figure 10: Sources of change
Source: Own illustration adopted from Zelesniack (2014, p. 11)

The presented Figure 11 depicts paths of change in an organization. The first model presented at this point is the top-down approach. For Balogun et al. (2016, p. 51), a top-down approach directs, controls, and initiates the change from the central strategic decision-making unit of the company. Normally, it includes a program of change that is designed and implemented by the most senior executives. Bachert and Vahs (2007, p. 281) agree and highlight that the ideas of the top management are carried down to the subordinated entities of the company. Vahs (2003, p. 324) puts special emphasis on the role of the management to guide the way and act as role models and provide a clear vision and concepts for the future. Power politics, however, have a subordinated role at this point. Nevertheless, the biggest advantage of this approach is the

significant flexibility in providing direction in the execution of change projects, as managers can clearly communicate the boundaries and rules of the development.

In contrast, the bottom-up approach works exactly the other way around. Balogun et al. (2016, p. 53) identify in the context of bottom-up change a different logic in the change process. They claim that the responsibility is handed down to the organization in order to motivate employees to act like entrepreneurs within the company. Concerning the effectiveness and the speed of development, the bottom-up approach is significantly slower. Interestingly, Vahs (2003, p. 53) finds at this point a different solution. He states that the starting point of bottom-up change is the lowest level of hierarchy. Starting there, the imposed changed shall emerge throughout the whole organization. Its advantage is that employees who feel the need for change can develop a solution that exactly fits. Nevertheless, this type of change process is the least common in organizations.

Vahs (2003, p. 326) sees the suitable application for the multiple-nucleus approach for organizations with flat hierarchies and a relatively high degree of freedom of departments. This enables companies to transfer collected information to other areas of the company and spread the change throughout the organization to transform it as a whole. As the most challenging dimension of this change process, Vahs (2003, p. 326) notes the danger of having too many individual solutions which are difficult to unify.

The fourth mode presented in the graphic enables change based on pilot sites. Balogun et al. (2016, p. 55) highlight an advantage that new work approaches can be tested in a safe environment, for example in a business unit or a spin-off. Advantages of this change management model is that (1) experiments can be executed in a safe environment without harming other business areas, (2) units which have already transformed raise awareness, and (3) a planned rollout reduces bond resources and cost.

5.2. Model Suggested Change Process

The available literature on change management provides a broad number of process models that try to depict and make change management more understandable. The model with the best reputation is Lewin's (1947) Three-Steps Model of Change (Figure 11). The three dimensions of this model: (1) unfreezing, (2) changing, and (3) refreezing were commonly applied as the basis for further research on that topic. For example, Balogun et al. (2016, p. 146) claim that the concept of Lewin (1947) leaves out essential dimensions and found that it is too simplistic and too linear. Especially in large corporations, complex processes of unfreezing, moving and refreezing effects exist. Nevertheless, they admit that the stages have a certain degree of validity and identified the

stages: (1) prepare, (2) mobilize, (3) move, and (4) integrate. They additionally add the analysis of the current and future state. In search for an ideal model, Krüger (2014, p. 6) builds on five stages in the change process and highlights four sources for strategic renewal. Different from the previous models, the famous approach of Kotter (1995, p. 61) is built on eight steps. Reisinger et al. (2013, p. 190) highlight the orientation towards the affected individuals of change. Furthermore, the model puts strong emphasis on the necessity to persuade and motivate people to participate in change.

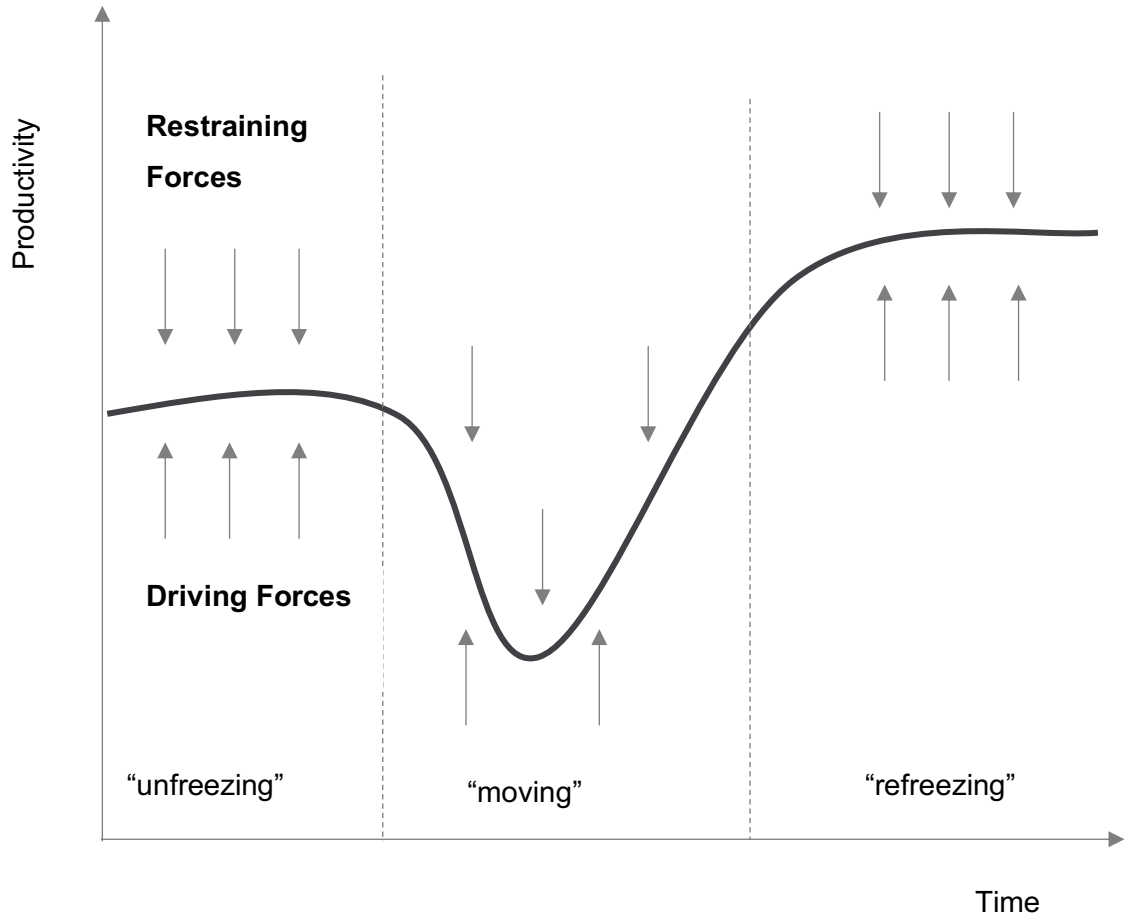


Figure 11: 3 Stage Model of Lewin
Source: Own Illustration adopted from Perscher (2010, p. 105)

The basic underlying understanding of the 3 Stage Model is the field theory. Burnes (2009, p. 334) who analyzed the extensive research of Lewin’s theory, summarizes the results and identifies two types of forces that keep the organizational values, rules and norms in equilibrium, which is called the status quo. The forces are defined on the one hand as restraining forces that try to maintain the situation and on the other hand driving forces that impose change and “push” against each

other. The primary dimension of Lewin's 3 Stage Model is called unfreezing. Senior and Fleming (2006, p. 349) interpret this stage as the wakeup call for people to start to rethink habitual behaviors and to increase awareness for the need to adapt to new market paradigms. Ewin (1947, p. 229) states that "the unfreezing of the present level may involve quite different problems in different cases." Furthermore, he continues "to break open the shell of complacency and self-righteousness it is sometimes necessary to cause an emotional stir up". Cummings and Worley (2015 p. 792) interpret the term to unfreeze as "the reduction in the strength of old values, attitudes or behaviors. The emotional stir can be induced by active promotion or force that enable the push for change, or the introduction of measures that destabilize the status quo." At this point, commonly available information shows a certain degree of discrepancies between anticipated goals and activities that currently happen (2015, p. 22).

In order to give meaning to the prerequisites of change, the researchers Beckhard and Harris (1987) developed the equation of change. Figure 12 shows the dimensions required to induce change. In other words, this means that change can only occur when the product of (1) unhappiness with the status quo, (2) the desirability to reach a certain goal and the (3) trust in successful change outweighs the personal cost (resistance to change) (Balogun et al., 2016, p. 154). Reisinger et al. (2013, p. 188) highlight in this regard that, employees who face change need to understand the relevance and importance of change. Employees need to understand why they should change and understand the aim of the change process as a whole. This requires questioning the standards, a break with the status quo and to take radical measures that all involved individuals understand the importance to adapt.

Senior and Fleming (2006, p. 349) highlight the importance of the second stage, changing. They claim the process to undertake successful change, which moves the whole firm to the next level. Nevertheless, it is not only the introduction of new measures, technologies and structures, but also the involvement of all affected individuals of the process. In order to succeed in the change efforts, Reisinger et al. (2013, p. 189) point out the need for flexibility and a certain scope of freedom in decision making. Furthermore, people who drive change should receive support as they act as role models to other employees too. Reisinger et al. (2013, p. 189) also identify the need to pay attention to people who restrain from adapting to new paradigms and provide suitable measures to involve these people actively.

$$C = (A \times B \times D) > X$$

When

C = Change

A = Level of dissatisfaction with the status quo

B = Desirability of proposed change

D = Practicality (risk of disruption) of change

X = Personal cost of changing

Figure 12: Change Equation
Source: Balogun et al., (2016, p. 158)

The final stage presented in the model is refreezing. Cummings and Worley (2015, p. 22) understand this final step as the re-stabilization at a different equilibrium. Commonly it is reached through the application of reinforcing measures to create a new set of organizational culture, structures and values. Senior and Fleming (2006, p. 351) add that management support is curtailed at this stage to avoid sliding back into old procedures.

In contrast to Lewin (1947), Kotter developed a model that is concerned with the effects of change on people. In his paper Kotter (1995, p. 59) states that “the most general lesson to be learned from the most successful cases, is that the change process goes through a series of phases that, which require a considerable length of time.” Rushing through the stages and even skipping one would create a misleading picture of success, without reaching desired change results. In other words, the model suggests a clear plan with clearly defined stages to successfully transform. Figure 13 presents the Eight Stages of Change by Kotter (1995). Additionally, it explains the dimensions of the model briefly.

Establish a Sense of Urgency

Examining market and competitive realities
Identifying and discussing crises, potential crises, or major opportunities

↓

Forming a Powerful Guiding Coalition

Assembling a group with enough power to lead the change effort
Encouraging the group to work together as a team

↓

Creating a Vision

Creating a vision to help direct the change effort
Developing strategies for achieving that vision

↓

Communicating the Vision

Using every vehicle possible to communicate the new vision and strategies
Teaching new behaviors by the example of the guiding coalition

↓

Empowering Others to Act on the Vision

Getting rid of obstacles to change
Changing systems or structures that seriously undermine the vision

↓

Planning for and Creating Short-Term Wins

Creating those improvements
Planning for visible performance improvements

↓

Consolidating Improvements and Producing Still More Change

Using increased creditability to change systems structures and policies that don't fit the vision
Hiring promoting and developing employees who can implement the vision

↓

Institutionalizing New Approaches

Articulating the connections between the new behaviors and corporate success
Developing the means to ensure leadership development and success.

Figure 13: The eight steps to transform an organization
Source: Own illustration adopted from Kotter (1995, p. 61)

5.3. Critical Dimensions of Successful Change Management

The theoretical assessment of change management proves the far-reaching effects of digital transformation. Kane (2015, p. 15) states that it does not only require a profound market understanding, as proposed by Christensen (2005), but much also a theoretical understanding of the dimensions of digital transformation. In detail well-balanced decision making in change management efforts with respect to the speed of change and the substantial modification of the business environment are required. Perscher (2010, p. 91) also identifies the complexity and adds that organizational change requires the understanding of procedural effects on people who are affected by change. In order to follow the overall research aim of the thesis, the following sub-chapters (1) leading digital change, (2) change communication, (3) involvement of affected employees and (4) handling critical emotions will focus on the special needs and issues of digital transformation. Literature provides extensive research results on change management and a large number of underlying concepts and theories and therefore, the author selected relevant dimensions of change management, in light of digital transformation to be highlighted in this chapter of the thesis.

5.3.1. Leading Digital Change

Robbins et al. (2010, p. 316) define leadership in general as “the ability to influence a group towards the achievement of a vision or set of goals”. In this regard, Hayes (2014, p. 167) emphasizes a clear difference in leadership and simple management as the research claims that leadership is a crucial enabler for successful change. As Kotter (2001, p. 4 f) states, management is concerned with solving the complexity and maintenance of the existing organizational structures, whereas leadership is about dealing with change and solving the challenges of the market and technological development. Robbins et al. (2010, p. 316) claim that the basis for a mandate to take guiding measures might be based on the formal position, as for example provided by the ascription of formal rank. Nevertheless, not all formally assigned managers or leaders can actively shape the future of organizations. Therefore, reliable and effective leadership in changing business environments is required to maintain a competitive advantage.

Hayes (2014, p. 167) points out the effects of leadership as growing evidence that the behavior of followers and change initiatives are influenced positively. Therefore, Hayes (2014, p. 169) analyzed available research results and combined them into seven leadership tasks. The primary task is sensemaking. At this stage, leaders have to identify opportunities and potential threats that need to be handled. Secondly, creating a vision is one of the most basic tasks. It should create an image of a more desirable future state. Furthermore, it should be enhanced by giving additional sense to the vision and make it more understandable and accessible to a broader audience in

order to win commitment to execute change. The next relevant task is (4) aligning the change vision for the organization to ensure that the management and the employees work jointly to achieve the vision. Furthermore, the leaders have to remove all barriers for change to (5) enable effective development. The sixth task introduced by Hayes (2014, p. 169) identifies adequate (6) support to those who are affected by the change as important. The final task in change management efforts is to (7) maintain and sustain the momentum. Leaders need to prove their commitment by demonstrating that change is actively executed.

While searching for a suitable leadership style to achieve these tasks, Robbins et al. (2010, p. 316) built their basic theoretical assessment of leadership styles on trait theories of leadership. The theory differentiates leaders from followers by looking at personal qualities and characteristics. Based on these findings, they highlight (1) charismatic leadership, (2) transform leadership and (3) transactional leadership. Robbins et al. (2010, p. 316) describe charismatic leadership as the application of extraordinary leading skills to a person. Hayes (2014, p. 179) adds that charismatic leaders have a significant and extraordinary influence on followers. Furthermore, Robbins et al. (2010, p. 345) describe transactional leaders as “leaders who guide or motivate their followers in the direction of established goals by clarifying the role and task requirements. At the same time, they define transformational leaders as people “who inspire followers to transcend their own self-interests and who are capable of having a profound and extraordinary effect on followers.” On the contrary, Hayes (2014, p. 181) introduces distributed leadership and argues that leaders should not be glorified as individual heroes who have the power to execute change single-handedly as modern organizational structures, where cross-functional teams and networks are dislocated from each other, make it necessary to spread the power. Gilley et al. (2009, p. 38 f), who studied the effectiveness of change, observed the importance of spreading power as the top management is in charge of developing the overall vision, but the mid-management and frontline workers are those who actively carry the burden of change.

Regarding digital transformation and change leadership, Creusen et al. (2017, p. 101) state that leaders need to adapt to changing paradigms due to a cultural shift and changed expectations of employees. To outline the new challenges of leaders Staffen and Schoenwald (2016, p. 5) put strong emphasis on the importance of digital skills. They identify leaders as game changers, as they are in charge to guide the organization through the industrial revolution by motivating employees and implementation disruptive changes. Furthermore, Staffen
and Schoenwald (2016, p. 5) take the leaders into charge to improve their teams trust in digital technologies and develop their awareness. In a more theoretical attempt to evaluate the required skill set for digital leadership, Valentine and Steward (2015, p. 4513) identify three relevant dimensions. Through their eyes, digital leaders need to bring an adequate skill and knowledge

base to govern the technology and to create a strategic advantage. Secondly, manageable risk of failure and the use of technology have a supportive function to increase corporate value. Bennis (2013, p. 636) states that digital leadership requires a high degree of adaptive capacity. In other words, he understands a high degree of resilience and the ability to approach challenges with a certain degree of persistence, with an appropriate culture of failure. Additionally, Bennis (2013, p. 636) highlights the importance of the individuals openness to new paradigms as a fundamental success factor.

In the search for a definition of digital leadership, Euler (2015) states that no common definition was found so far. In his research, he identified three different understandings commonly used: (1) leadership that employs digital tools, (2) leadership that is concerned with leading digital natives, and (3) leadership during the process of digital transformation. Differently, Hüsing et al. (2013, p. 13) find an unambiguous definition and state that digital leadership "is the accomplishment of a goal that relies on Information and Communication Technology (ICT) through the direction of human resources and uses of ICT." Furthermore, they point out the difference of digital leadership, as different goals are pursued, and different resources are involved. For De Waal et al. (2016, p. 53), digital leadership requires the ability of leaders to understand, recognize and realize business changes for future value creation and business success, through the professional application of digital technologies. Furthermore, digital leadership addresses different stakeholders in a way to improve their own needs and aligns all resources with executing change effectively.

The current literature on digital transformation proves that leadership plays an important role in sustainably executing change in an organization as Fitzgerald et al. (2013, p. 7) and Kane (2015, p. 5) point out. Nevertheless, the available literature on digital leadership is limited. A common definition is not yet available. Furthermore, research in this context is commonly focused on individual skills of managers and solution orientated as the findings of Staffen and Schoenwald (2016), Valentine and Steward (2015) and Bennis (2013) show. As basic leadership theory is still applicable to digital leadership, no particular digital leadership theory as fundamental as transformational leadership was identified.

5.3.2. Change Communication

Communication has a relevant role in change management. Hayes (2014, p. 212) claims that change communication is of great importance especially when it comes to "people's issues". Furthermore, he claims that leaders need to be able to make the vision of the company clear to employees and to provide inspiration and motivation to invest efforts for a sustainable change. Elving (2005, p. 132) adds in this regard that change communication is built on two paradigms.

Primarily it aims to deliver information to employees. Secondly, it helps to develop corporate identity and a positive attitude of employees towards change, which fits the organizational requirements. Krüger (2009, p. 312) provides in this regard, as representative for the large number of available interpretations, a suitable definition and states that communication is “the center of goal-oriented exchange of information from a sender to a receiver in a specific context.” Furthermore, he states that “communication in general is built on the pillars of (1) the channel of communication, (2) timing and (3) the location. Regarding organizational change, communication is aimed to change the mindset and behavior of followers into a desired set of behaviors.”

The researcher Schulz von Thun (1981, p. 13 f) identified four aspects of communication: (1) self-revelation (2) relationship level, (3) factual information and (4) appeal level. For Krüger (2009, p. 312 f) this model has, especially in change contexts, relevance as social effects have a certain influence onto the assessment of information. In particular with transformational change, communication has a significant social mandate as it contributes to reducing uncertainty and provides specific information to certain target groups. For Mast (2008, p. 209ff) change communication is built by the combination of different forms to spread information. Therefore, she identifies the existence of formal and informal communication. In detail, she understands formal communication to occur when information follows the official communicational structures institutionalized in the organization. Contrastly, information spreads commonly within the company in a non-official way.

Krüger (2009, p. 317 f) and Kostka & Mönch (2009, p. 60 f) highlight the relevance for an well-designed communication strategy for every change project. Such a concept should include firstly the goal definition as well as the planned activities for its achievement including the target group describing a clearly defined group of people who should receive the information. Secondly, the amount of transferred information has to be set and decided which information is passed on, for example, future goals, the reason for change, etc. The next important dimension in the changing concept is timing. The schedule of presentations has significant influence on the success of the change effort as the employees have to be informed early enough. At the same time, preparations have to be finished before spreading the information. The final dimension in a change communication planning is the identification of the ideal channel for communication. For this a broad number of tools is available such as meetings, Intranet, Kick-offs, face-to-face talks, and workshops. Also Reisinger et al. (2013, p. 173) point out that a working corporate communication actively supports the improvement of the trust level of employees. In times of economic difficulties or transformations of the business, workers must be able to build on this trust with management to lead the company out of troubles. In addition to the internal value, also the degree of trust with external stakeholders grows.

5.3.3. Involvement of affected employees

The research of Morgan and Zeffane (2003, p. 55 f) identifies a development in the approach of how companies deal with their employees during the planning and roll out of change projects. The researchers highlight the growing importance of trust in the employee – organization relationship. They claim that trust of employees is the backbone in a changing environment. Mutual trust enables the exchange of individual expertise and internal process knowledge between the management and the workforce, as Nielsen and Randall (2012, p. 93) claim. Furthermore, this knowledge transfer eases planning and implementation activities.

Fenton-O'Creevy (2001, p. 24) highlights ongoing research on the effects of employee participation or involvement in change projects. The overall results of the investigations reach consensus of the positive effects on work ethics, employee performance and job satisfaction. In this regard Fenton-O'creevy (2001, p. 28) defines employee participation as "the exercise, by employees, of influence over how their work is organized and carried out." Balogun et al. (2016, p. 62) agrees on the findings of Fenton-O'creevy and argues that the involvement of employees has positive effects on the commitment of individuals. Nevertheless, the degree of involvement needs to be limited to a specified field. For example, the vision of change, as well as the desired goals, have to be given, but for the way how individuals achieve these goals, a certain degree of influence can be given. Hayes (2014, p. 240) emphasizes the potential excitement and increased motivation to develop the company further is a clear benefit of participative change management efforts. Furthermore, he states the more people are actively involved in a participation workshop, the more they feel the impact of their work. As a form of participation, Balogun (2016, p. 63) suggests holding workshops where change agents present their ideas and employees provide in return inputs and opinions from their points of view. For Hayes (2014, p. 241), such a management approach produces better decisions as a set of wider inputs is taken to account. As a potential downside, Balogun (2016, p. 63) mentions that employees might feel manipulated and the entire process consumes time.

5.3.4. Handling Critical Emotions

Change always affects employees to leave their comfort zone and transform into a new state, as the 3-Stage-Model of Lewin (1947) claims. Hayes (2014, p. 259) argues in this regard that affected individuals from significant change experience a process of personal transition. Hayes (2014, p. 260) finds an apt description as he explains that "organizational change involves the ending of something and the beginning of something else." Balogun et al. (2016, p. 147) even compare such a personal transition with a mourning process. Therefore Hayes (2014, p. 260) states that planning can have positive effects but cannot avoid the process of personal transition. Carnall (2007, p. 240) adds that the personal state is influenced by a reduction of self-esteem, performance and

satisfaction. Furthermore, Hayes (2014, p. 261) states that a psychological transition reaction follows a cyclical and predictable stage. Usually, people who experience change have to go through all stages of the transition.

Figure 14: Personal transition model
Source: Hayes (2014, p. 261)

Figure 14 presents the model of personal transition. It presents the emotional stages individuals path through in the context of change. The original model was initially developed by Adams et al. (1976) and further developed by Hayes (2014), Balogun et al. (2016) and Carnall (2007). As Hayes (2014, p. 261) shows the model has seven stages of emotional development. The primary stage is called (1) shock/awareness. Hayes (2014, p. 261) points out that individuals experience a shock when change projects are announced, especially when the change comes unexpectedly. Depending on the degree of consequences, people might feel overwhelmed and paralyzed. Furthermore, emotions of panic and fear might hinder people from assessing the situation rationally. Balogun (2016, p. 148) identify at this point a significant reduction in self-confidence, as employees need to leave the comfort zone and undertake private adoptions to new paradigms. In the (2) denial stage, people neglect the reality of change. Undesired new projects are denied, and the main attention is focused on less important tasks. Employees try to stick to familiar activities and to preserve the status quo. Clinging to “old” values and procedures has a positive effect of reducing anxiety at this point. The degree of resistance to change reaches is in this phase the greatest extent (Hayes, 2014, p. 261). Carnall (2007, p. 242) connects to this stage defensive behavior as people try to protect their own territory. Balogun et al. (2016, p. 148) provide as

reasoning for the growth of self-confidence in the denial stage that individuals try to rationalize the changes as insignificant for them personally. Therefore, they do not need to adapt new paradigms. The (3) depression stage is characterized by confusion, anger, withdrawal and even sadness, as affected people realize that change becomes apparent. This depressed mood occurs even in initially positively motivated change projects (Hayes, 2014, p. 261). For Balogun et al. (2016, p. 148), people need to develop an awareness that there is no way around the change and personal adoption is inevitable. Self-confidence is falling significantly in this stage. The fourth stage is called (4) letting go or acceptance. At this point people accept that there is no other way than adopting and old values, behaviors and procedures are left behind (2014, p. 262). In the fifth stage, Balogun et al. (2016, p. 149) state that people start to (5) test new behaviors and begin to identify with the new. Hayes (2014, p. 262) adds that even though the situation is still very unstable as anger can burst out quickly and a more pro-active and experimental involvement to the new situation occurs. The growing self-esteem after the “valley of tears” leads to (6) consolidation. At this stage, employees create a common understanding of which behaviors work. Finally, in the (7) internalization, reflection and learning stage, the new norms and standards have been accepted and the past has been left behind and the self-confidence level has exceeded the level of the starting point. (Hayes, 2014, p. 263)

As a conclusion for the model Hayes (2014, p. 263) states that change is experienced by every individual in a specific way and is depended on several factors. These include the type and intensity of transition if people experience it as enhancement or burden and the individual’s readiness for adaptation. Therefore, the duration of the process, slope of the curve and potential setbacks are highly dependent on the situation. The available literature on emotions in digital change management is still underdeveloped, as only little empirical data is available. Nevertheless, the comparison of the findings in Chapter 4 to those of change management show the high degree of interdependency and the validity of the personal transition model also in digital transformation projects.

5.4. Resistance to Change

Mohr et al. (2010, p. 178) claim that resistance always occurs in transforming environments and claim “no change without resistance.” As reasoning for this statement, they point out that transformations might cause a significant amount of fear, similar to the findings of Balogun (2016) and Carnall (2007) in the shock phase. Commonly available literature suggests that the negative attitude towards change is inherited, omnipresent and irrational as the findings of Ford et al. (2008, p. 352) and Dent and Goldberg (2000) among others show. Doppler and Lauterburg (2001, p. 217) and Mohr (2010, p. 178) also state that it is normal to face resistance in change projects. Nevertheless, they outline the importance of addressing problems in this regard as early as possible in order to avoided project failure due to growing cost and delays in the execution.

In the search for a definition Pieterse et al. (2012, p. 800) point out that resistance to change, based on the findings of traditional literature, describe it as collateral damage to change endeavors. Its appearance differs, varying from withdrawal, sabotage and strikes, to whistleblowing and symbolic sabotage. In an older but still valid search for developing an understanding, Waddell et al. (1998, p. 543) brings the findings from other researches to the point and links resistance with “negative employee attitudes or with counter-productive behavior” of employees.

In the detailed analysis of resistance to change, Mohr et al. (2010, p. 179) mention the different faces of resistance. As proposed in the famous Iceberg-Model of Edward T. Hall (1976) only formal structures such as tasks, budget, processes are observable by an outsider and informal, but very relevant values such as routines, social norms, believes, feelings and attitudes are unobservable, Mohr et al. (2010, p. 179) build the connection to change management in which they state that resistance to change occurs not openly as the real sources to fight against the transformation are not communicated. In this regard, Table 5 presents Doppler and Lauterburg’s (2001, p. 221) different forms and sources of resistance to change.

As the previous findings of this chapter show, resistance is unavoidable when change is executed. Nevertheless, active management helps to resolve the troubles. Vahs (2003, p. 302) identifies a significant number of available literature that provides suggestions for measures to solve resistance and guidelines for managers. For example, Hayes (2014, p. 253) suggests a broad set of different measures such as active involvement, support, negotiation and or in extreme cases coercion. However, Ford and Ford (2009) highlight the positive side of resistance as it actively improves the change process as it increases awareness and changes the change, as critical thoughts help to develop ideas further.

	Verbal	Nonverbal
Active	Contradiction • Counterarguments • Accusations • Threats • Polemics • Stubborn formalism	Agitation • Unrest • Quarrels • Intrigues • Rumors • Formation of cliques
Passive	Evasion • Silence • Trivializing things • Fooling things • Arguing unimportant things	Lack of enthusiasm • Carelessness • Tiredness • Staying away • Going off sick

Table 5: Forms of resistance
Source: Own illustration adopted from (Doppler & Lauterburg, 2014, p. 221)

5.5. Challenges of Digital Change Management

The dynamism and the increased speed of technological developments in the digital transformation draws the spotlight to changed paradigms also in change management, as Marie-Laure Friction D'Amour (2016, p. 4) claims. Schoemacker (2018, p. 15) combines such a dynamism in the acronym VUCA, which stands for an volatile, uncertain, complex and ambiguous business environment and justifies the application of the original US military developed model by highlighting a significant trend for fast changing market paradigms for organizations. Bennett and Lemoine (2014, p. 1) add additional details to the acronym and understand (1) volatility as a challenge that is unexpected and unstable and probably of unknown duration. As knowledge is accessible, problems are understandable. (2) Uncertainty is described as a lack of relevant information. For example, a market participants pending product is threatening the future success of their own product. Furthermore, they understand (3) complexity as a situation which has a significant number of interconnected parts and variables. The nature and volume of the problem and volume of available data might be overwhelming in the process, even though parts are understandable. The final part of the acronym (4) ambiguity emphasizes the unknown and unclear causalities of relationships.

In order to master such fast-changing business environments. Thode and Wistuba (2018, p. 110) highlight the importance to address VUCA challenges with suitable methodologies and agility. This means that the company must be able to react to unexpected and short term changes in the business environment in a fast and flexible way. In the context of digital change, Keller et al. (2019, p. 6) highlight that this dynamism of market and technological development have significant effects on organizational working conditions as well as on individual skill requirements of workers. Independently from the underlying time horizon in the digital transformation, the internal employee development faces the challenge to deal with growing uncertainty of employees (Keller et al., 2019). In order to meet the demanding new skills of organizations in the context of a VUCA business environment, Dahm and Walter (2018, p. 18) suggest five prerequisites to develop a change culture that is sustainably contributing to a successful digital transformation.

Room for creativity	Promote employees to work in the black space and to spend time to connect available knowledge within the company
Think digital	A digital mindset is built on the behavior of a leader who acts as role model, in order to guide the way and promote the digital vision
Accepted failure	A working failure culture supports the digital transformation as it develops the internal learning process.
Develop existing workforce	Cross-disciplinary involvement of employees and specific training facilitates the acceptance and understanding of new technologies
Hire new talent	Employees from cross-functional fields contribute to the development of a digital culture by combining different experiences with specific fields of competence

Table 6: Prerequisites of a sustainable digital change culture
Source: Adapted from Dahm and Walter (2018, p. 18)

5.6. Summary

Change management is a research field that gained extensive research interest. Therefore, a broad number of available findings exist. As an example, Vahs (2003, p. 252) understands change management as “the target-oriented analysis, planning, realization, evaluation and continuous measures of change in an organization.” Balogun et al. (2016, p. 23) highlight the different faces of change that are evaluated based on the end result (transformation vs. realignment) and its nature (incremental vs. big bang). From a change process oriented view, Kurt Lewin (1947)

developed the most reputated model. It puts change management into three basic stages (1) unfreezing, (2) changing, and (3) refreezing. Furthermore, four critical success factors were identified in this chapter. Creusen et al. (2017, p. 101) point out the importance of (1) digital leadership, as leaders are in charge to select technologies, create a vision for future success and motivate employees to follow. The second critical dimension identified is (2) change communication in order to reduce uncertainty and drive the company spirit (Elving, 2005, p. 132). Additionally, the (3) involvement of employees should increase the cohesion and create positive feelings among the employees (Hayes, 2014, p. 241). Finally, the dimension (4) handling critical emotions sheds light onto the emotional process employees undergo in change environments (Hayes, 2014, p. 261) and proves that resistance is normal, but bearable with adequate management (J. D. Ford & Ford, 2009).

In conclusion, it can be said that general change management issues are very well described in literature. However, up to now detail theoretical models specially designed for digital transformation are rare. Nevertheless, the basic change literature is with some adaptions able to be applied as the digital transformation can be classified as a revolution in the model of Balogun et al. (2016, p. 25) due to the findings of the previous chapters.

6. Interim Conclusion

The chapter interim conclusion combines the findings of the theoretical part of this thesis and aims to answer the proposed research questions based on theory.

The results of the literature review on identifying the origins of digital transformation pressure highlight the strong influence of external factors. Changes in customer expectations promote the idea that new technologies and products will become attractive to the mass market and therefore trigger a transformation from established market paradigms to new approaches which threatens existing business models (Christensen, 2005, p. 144 f). The influence of technological development occurs as a subsequent driver of digital transformation, as technology follows the market and develops solutions to meet the market's needs and customer expectations (Paap & Katz, 2016, p. 18). Therefore selecting the right technology is critical for the long-term success of the company. (Rogers, 1995; Tornatzky & Fleischer, 1990).

The understanding of digital transformation strategy has seen significant development. Bharadwaj et al. (2013, p. 47) highlight the need to integrate functional IT strategies in the context of digitization projects into the overall corporate strategy to be able to execute them successfully. The far-reaching scope and broad influence of digital transformation strategy and its aim to align and prioritize the broad number of independent threads of transformation efforts. In this regard, a holistic digital transformation strategy is required throughout the entire company in order to create collaboration capabilities and to improve overall performance. The available literature does not give clear suggestions on the degree of intensity and the development speed of digital transformation.

In order to undergo the digital transformation process, specific considerations have to be implemented on the managerial, organizational, and structural level. This means that commitment from the top management is a prerequisite success factor. Therefore a convincing corporate vision and active management of digital transformation efforts promote the integration of changes from the management board downwards (Fitzgerald et al., 2013, p. 7; Kreutzer et al., 2018, p. 47). In terms of organizational responsibilities, the analyzed literature emphasizes the importance of assigning a specialized digitization officer to the board (Horlacher & Hess, 2015; Singh & Hess, 2017; Tumbas et al., 2017). The main task of such a position is to foster a cross-functional and collaborative work approach throughout the whole company. In addition to technological tasks, Chief Digitization Officers are in charge of developing a communication strategy and to cultivate a corporate culture that promotes digital work approaches (Fitzgerald et al., 2013, p. 7; Kane et al., 2017, p. 12). With regard to the structural adaptation, Hess et al. (2016, p. 132) emphasize

the importance of an organizational structure that promotes the individual needs of a company to reach a desirable effectivity and efficiency (Reisinger et al., 2013, p. 30). Tactical models, centralized models, and champion models are identified as suitable for the digitally transforming companies in common literature. (Guest, 2014, p. 9; Mathiassen & Pries-Heje, 2017, p. 116).

Concerning digital transformation strategy types, a vast number of different options are described in literature and can be divided into two groups. The first group consists of strategies which build the skill and knowledge base from within the company, for example development through incremental steps. The second group includes those companies which source knowhow from outside, e.g. take overs or external sourcing (T. Hess et al., 2016, p. 131; Kaltenecker et al., 2015, p. 13). Even though the strategies are well described (Kaltenecker et al., 2015, p. 13), a specific strategy type ideal for digital transformation has not been described in detail in literature yet.

Change management as an important component of every transformation process is well described in literature. The basic concepts such as the change process of Lewin (1947) and the phases of personal transition (Hayes, 2014, p. 261) are still applicable as in traditional business transformations as the models can be used to generalize many different scenarios. With regard to digital change leadership, leaders should have a high degree of digital awareness and a certain degree of technological understanding in order to tap the needs of transforming the corporate culture and to curb resistance (Creusen et al., 2017, p. 101; Staffen & Schoenwald, 2016, p. 5; Valentine & Stewart, 2015, p. 4513). Furthermore, these measures need to be enhanced to meet the needs of digital dynamism. This means that digital transformation requires a culture that promotes corporate learning, provides room for creativity and accepts failure, and promotes continuous learning (Dahm & Walther, 2018, p. 18)

7. Empirical Study

The overall goal of the empirical part of this thesis is to enhance the available theory of digital transformation and the underlying change process. Therefore, twelve expert interviews were completed to provide detailed insights and to connect the theory to perceptions of industry experts.

To fulfill the aim of the empirical part, relevant data was collected through semi structured-interviews as they provide freedom to reflect on digital transformation without restriction biases of interviewers (2016, p. 16). Additionally, Eisenhart (1989 p. 536) emphasizes the importance of having a clear research question in place to ensure a clear goal. In order to make the theoretical analysis of the topic comparable to the empirical results, the research question will remain as defined.

To outline the empirical part in more detail, the following subchapters introduce the applied methodologies by providing insights into the fundamental paradigms of the qualitative study such as reason for the research design, unit of analysis, method of data collection and data analysis.

7.1. Case Selection and Unit of Analysis

The selection and definition of the unit of analysis is a critical step in the design of qualitative studies. The investigated population is important because case participants have significant influence on the basis of information generalization. (Eisenhardt, 1989, p. 535 f)

The Upper Austrian industry environment has been identified by the author as satisfactory to answer the research question because active investments and efforts to drive the digital transformation forward are being taken. For example, with the support of the industry startup innovation platform Pier 4 digital transformation in Upper Austria is expanding (tech2b, 2018). The selected unit of analysis are experts that are grouped to three distinct sets. The first group are (1) CEOs. As already described in the theoretical part, top-level managers have significant influence on the overall strategic orientation of a company as they develop the long-term vision (Fitzgerald et al., 2013, p. 7). For the study this group is relevant because they have a long-term view of company development and decision making. The second group of interest are (2) digitization experts. Even though, Singh and Hess (2017, p. 2) emphasize the importance of Chief Digital Transformation Officers, the results of the empirical study of the number of Chief Digital Transformation Officers executed by Walchshofer and Riedl (2017, p. 7) shows a different picture. The research team claims that only 52 CDOs were identifiable in the whole DACH region. Based on this little number of clearly defined C-level managers with a sole focus on digital transformation,

this group shall not be defined only by job title. Therefore, the unit of analysis is not specified to a job title but instead looks at being responsible for digital transformation within the company. This group is relevant for the study as detailed insights into transformation efforts and running digital transformation projects can be given. The third group are (3) digital transformation consultants. The expertise of this group is relevant for the study as different perceptions from a broad number of companies can be combined to draw holistic conclusions.

Table 6 introduces the selected expert interview partners. Additionally, it highlights the main field of business, expert type, position and sex of the interviewee.

Nr.	Code	Position	Branch	Sex
1	C1	CEO	Consultancy/DT Services	Male
2	C2	Executive Managing Director	Automotive	Male
3	C3	Managing Director Operations	Manufacturing	Male
4	C4	Executive Director	Banking	Male
5	D1	Head of Digitization	Banking	Male
6	D2	Head of Tech. Management	Utilities	Female
7	D3	Digital & IT Innovation Manager	Automotive	Male
8	E1	Project Manager	Consultancy/DT Services	Male
9	E2	Project Manager	Consultancy/DT Services	Male
10	E3	Project Manager	Consultancy/DT Services	Male
11	E4	Engagement Manager	International Consultancy	Male
12	E5	Project Manager	Consultancy/DT Services	Male

Table 7: Overview of Interview participants
Source: Own Table

7.2. Method of Data Collection

As the primary source of data collection semi-structured interviews were conducted with the selected corporate representatives. Even though Yin (2003, p. 106) highlights potential negative influence due to biasty of the interviewer, as well as of interviewee, the data collection method provides significant advantages to meet the research goal. For example, interviews allow for the possibility to tailor questions specifically to individual cases.

As theoretical input for semi-structured interviews, Döring and Börtz (2016, p. 372) point out the basic difference between structured and semi-structured interviews. While with the structured interview the boundaries are clearly defined by a set of questions, the semi-structured interview is built on a loose framework of questions which helps the interviewer to amend the structure of the interview by changing the questions without missing important parts.

The interview guideline and the integrated touch-points develop a framework for the data collection as well as the basis for the following data analysis which makes different interview results comparable. Nevertheless, the semi-structured interview provides enough freedom to react spontaneously to special situations and implement additional questions. Furthermore, the questions need not be asled word by word. In order to maintain a good flow of the interview, the questions shall be adopted to promote the flow of information. Commonly an interview guideline consists of 8-15 questions. Usually, one interview takes approximately 30 - 60 minutes (2016, p. 372). In order to not miss important information, the interviews are recorded with consent of the interviewees.

The underlying interview guideline for this thesis was designed according to the previously identified theoretical implications. The general introduction to the interview was held as objective as possible in order to avoid confusion and bias as stated previously. After the introduction, the interview guideline is orientated along the theoretical assessment of digital transformation and split into seven parts. The primary stage (1) Definition of Digital Transformation is not only used as a warm-up stage, but also to test if a common understanding exists in the industry. Secondly, the section (2) Digitally Transform or Die assesses the degree of intensity of digital transformation. A subsection with choice based questions helps to compare sources of digital transformation pressure. The question block (3) Digital Strategy aims to identify the challenges of strategic planning and the execution of digital transformation. The parts (4) Responsibilities and (5) Organizational Structure assess organizational challenges of spreading tasks and responsibilities across the organization. This means they aim to identify the responsibility of digital transformation and whether it is developed in a centralized or decentralized organizational structure. The choice

based section of (6) Strategy & Knowhow assesses six different types of digital transformation strategies. The results are used to identify the most adequate strategy for digital transformation. The final section of the interview guideline is concerned with (7) Digital Change Management. It evaluates the perception of industry experts and whether digital transformation requires new approaches in light of change management.

The maturity of the semi-structured interviews of this thesis were executed in a face-to-face setting as the study participants are all located in Upper Austria. Three of the interviews were conducted via telephone or Skype for easier coordination. For documentation, the interviewees were recorded in order to collect all relevant data. To make the information comparable, the recordings were transcribed. On average the interviews lasted approximately 30 minutes as planned in the interview design. Minor adoptions to the interview guideline were made during the data collection phase for performance improvements and as a reaction to topics of special interest during the interview.

7.3. Data Analysis

The underlying collected data analysis process is based on a qualitative content analysis with an inductive approach as suggested by Mayring (2015, p. 85). The inductive qualitative content analysis provides a holistic and unbiased depiction of the transcribed data and is therefore suitable to combine the perceptions of digital transformation by industry managers with the available literature. In regard of the coding process, Mayring (2015, p. 85) states that the inductive coding process develops codes during the text analysis process without connecting it to previously investigated theoretical concepts. For the definition of selection criteria's, codes are developed on a more holistic approach to be generalizable as the interviewees represent different industries and job titles. The transcripts were paraphrased, generalized and in a final step allocated to categories to being able to draw conclusions from the collected data. As the interviews were conducted in German, the collected statements were translated into English.

In order to manage and document the suggested procedure, the transcripts were analyzed with the coding software MaxQDA. The software supports the coding process and enables the researcher to build codes easily without missing important parts of the interviews. Furthermore, it supports the inductive analysis approach as it enables adjustments to the codes if necessary and graphical illustrations. The choice based questions are presented by radar graphs and the utilization of the arithmetic average in order to display the divergence of answers between the expert groups.

It is important to note that the collected research results are not representative due the relatively small number of interviewees and the variety of industry backgrounds. However, Döring and Bortz (2016, p. 297) justify this working approach as they claim that “the sample size is dependent of the research goal. For theory developing researches in quantitative as well as qualitative studies it is commonly accepted to rely on small and selected samples”.

7.4. Evaluation of Results

The following chapter presents the collected information from the interviews. Based on the developed coding system and the resulting categories, the data is compared and analyzed accordingly. For better understanding and detailed insights, important statements are highlighted. Additionally, the choice based questions are presented in graphs for better visualization. The structure of the analysis follows the theoretical part of the thesis and the outline of the interview guideline as discussed with regards to the method of data collection.

7.4.1. Definition

The subchapter 7.4.1 Definition assesses how digital transformation is understood by the study participants.

The results of the first section concerning the understanding of digital transformation show that there is no clear understanding yet and different opinions exist among the experts. However, the presented definitions of the industry experts in Table 7 below can be allocated according to their main focus of (1) process, (2) technology (3) customer and one individual view (4) product.

Expert	Definition	Group / Focus
C2	DT is the collection of all potential values which are reachable with media and new technology. These are built at the data, process, and system levels.	Technology
D3	DT is the integration of digital technologies into products, production and processes. It requires coordination between entities and adaptation of organizational culture, agility and open innovation.	Technology
E2	DT is the implementation of digital elements into existing business models in light of internal process automation and digitization.	Technology
E4	DT is based on the introduction of technology and changes the way of working together.	Technology
C1	DT is an enhancement of product range which requires holistic development of the business model and is specific to every industry.	Product
C4	DT is a change to automated processes and gets closer to the customer by transferring labor intensive processes into fully automated digital processes.	Process
D2	Digital is the new normal; where humans have less influence on business success. However, DT is a cultural issue not a technological issue.	Process

Expert	Definition	Group / Focus
E1	DT changes the market by substituting paper-based processes into digital ones and turns product providers into service companies.	Process
E3	DT increases process efficiency and has the potential to radically change business models.	Process
E5	DT is the extensive depiction of processes in a digital way and DM on extensive data as basis for new data-driven business models.	Process
C3	DT is not clearly defined yet, but its aim is to put customer orientation and organization into the center of all efforts by reducing complexity for employees.	Customer
D1	DT puts the customer at the center of all efforts and is the combined understanding of ubiquity: always, everywhere, at all times and individual.	Customer

Table 8: Definitions of digital transformation stated by interviewees
Source: Own Table

The majority of the interviewees focused on process improvements as the main part of the definition for digital transformation. The personal definitions for this group focus on changes in work processes, digitization of paper-based processes and automation of labor intensive work. In detail industry experts see the extensive depiction of processes with digital tools and the reduction of manipulative tasks. C4 highlights in this regard that “Digital transformation is the unlimited automation and digitization of workflows. Especially of those which require multiple manipulative tasks by employees” (Interview C4 Z28-32). In the context of process improvement E5 adds the potential for improved decision making due to the extensive use of data “…as it gives the opportunity to gain new insights into the business environment and to develop new business models or develop existing once further based on this knowledge” (Interview E5, Z5-8).

The second group of answers focuses onto the application of new technology. The main understanding of experts who focused on the application of technology in their answer is to enhance business models and products by the application of digitally enabled technologies. For example, D3 understands digital transformation as the “…integration of digital technologies into product, production and processes. It requires the coordination between involved entities and adaptation or organization culture, agility and open innovation” (Interview D3 Z11-15). Differently to D3, the expert C2 claims that digital transformation is “the collection of all potential values which are accessible by media and new technology on the data, process, system and valorization level” (Interview C2 Z11-14).

For the third group, the customers are in focus for all digital transformation efforts and an understanding of ubiquity has to be developed in order to continuous individual access to services for customers, despite uncertainty. Additionally, it needs to reduce the complexity for employees. The definition by C1 focuses on comparing others with the enhancement of the product range and claims that “digital transformation is an enhancement of product range which requires holistic development of the business model and is specific to every industry” (Interview C1 Z16-20).

As the table above shows, within the interviewees groups, for example, C-level experts, conformity on the content of a digital transformation definition has not yet been reached.

7.4.2. The degree of intensity of digital transformation

This chapter evaluates the pace of digital transformation and if it is a critical success factor for sustaining corporate advantage.

The assessment on the intensity of digital transformation draws a clear picture. The vast majority of the interviewed experts fully agree with the statement “Digitally Transform or Die?”. As reason for the threats of digital transformation, the interview participants identify a certain pressure to execute digital transformation projects as companies fear losing competitive advantage as it happened already in other technological transitions too. Therefore, E5 states that “… the easiest processes need to be digitized … as the competitive advantage might be lost due to lacking agility in the administration and the extreme speed of digital transformation” (Interview E5 Z19-22).

Digital as the new normal was mentioned as a second potential die factor multiple times by the study participants as machinery without data integration does not exist anymore nowadays. Furthermore, experts highlighted the rapid development of digital solutions and the already high degree of interconnection between online and stationary business models as a prerequisite to reach the customer and its growing importance. The consensus of the respondents was that the time left to survive without a high degree of digital integration is highly specific to the digital maturity of the industry branch.

Interestingly, only one of the interviewed experts did not identify digital transformation as a die factor, as he claims that good haptic products will not disappear from the market, but the challenge is “how business models, production processes, and services will look like in the future. There will be definitely a change and at least partial digital integration will be required. It this makes digital transformation a die factor is unanswered, but it will lead for sure to disadvantages in competition" (Interview E1 Z43-50).

Concerning the development speed and the degree of radicalism, the results of the answers differ significantly. Nevertheless, the largest group of experts see digital transformation as an evolutionary development that is already running at a development speed that differs in every industry. “The most commonly asked question when are we finished with digital transformation can’t be answered as ongoing transformation and development is the new normal” Digital transformation is no metamorphosis with a pre-defined end result, much more it is a continuous development, that requires ongoing measures to maintain the momentum of change. (Interview E4 Z551-554). In contradiction to these perceptions, one expert argues in favor of a revolution as it opens up new markets for new business models that haven’t been possible before. Nevertheless, for the second largest group of respondents, the degree of intensity is unclear as the goal and end results are not observable yet.

7.4.3. Sources of Digital Transformation Pressure

This subchapter assesses and compares the results of the choice based questions concerning the sources of digital transformation pressure. The answers build on the arithmetic average. Additionally, the forms of pressure are analyzed in order to identify differences between the expert groups.

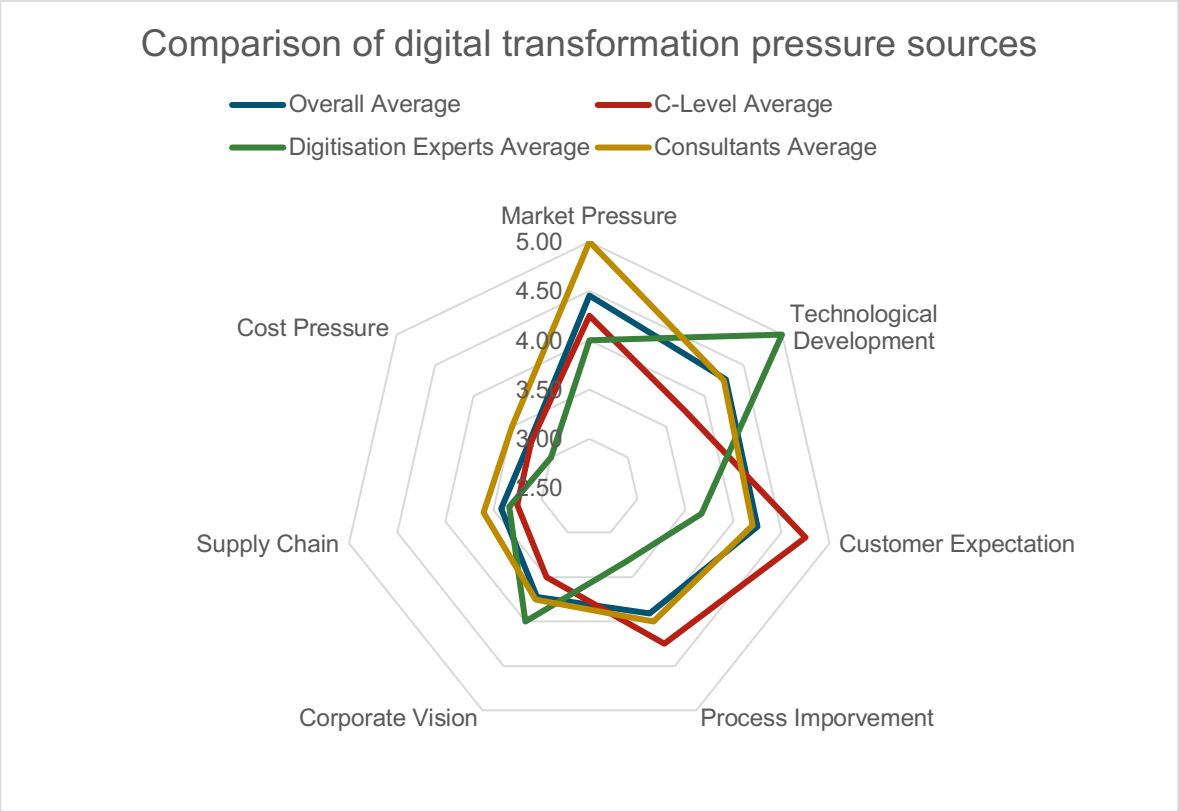


Figure 15: Comparison of digital transformation pressure sources
Source: Own Illustration

Figure 15 presents the seven different forms of digital transformation pressure and compares the answers of the overall average with the results of the internal group results. The answers are displayed in form of the “Overall Average”, the “C-Level Average” the “Digitisation Experts Average”, and the “Consultants-Average” in order to make the results comparable.

Market pressure is on average the biggest driver, followed by technological development and customer expectation. The least common driver to execute digital transformation pressure is the need to reduce cost, followed by pressure induced from the supply chain. Process improvement and the corporate vision are neither seen as a strong driver nor as unimportant.

It is important to note that the results show that every internal group identified a different source of pressure as the most significant one. The C-level managers rated customer expectations the most important, whereas the technological experts in the digitization group identified technological developments as the most significant one. The group of consultants agreed fully on market pressure as being the predominant driver for digital transformation.

The most surprising results from this question came from the differences in the perception of impact of the pressure source between the different expert groups. Whereas digitization experts rank technology as the most important driver, the group of C-level representatives did not pay much attention to technology pressure. On the contrary, the C-level experts valued customer expectation the highest, but for the digitization experts the perceived customer pressure is much less. Nevertheless, all three groups see the least pressure coming from costs and the supply chain.

As the general aim of the empirical study is to provide detailed and qualitative insights into digital transformation every highlighted sources of pressure will be discussed in detail in the next sub-chapters. Additionally, to quantitative comparison of the expert groups special focus is put onto the personal perception of the industry experts by giving mean to the collected answers.

7.4.3.1. Market Pressure

The following section assesses the answers of the respondents with regard to market pressure in detail.

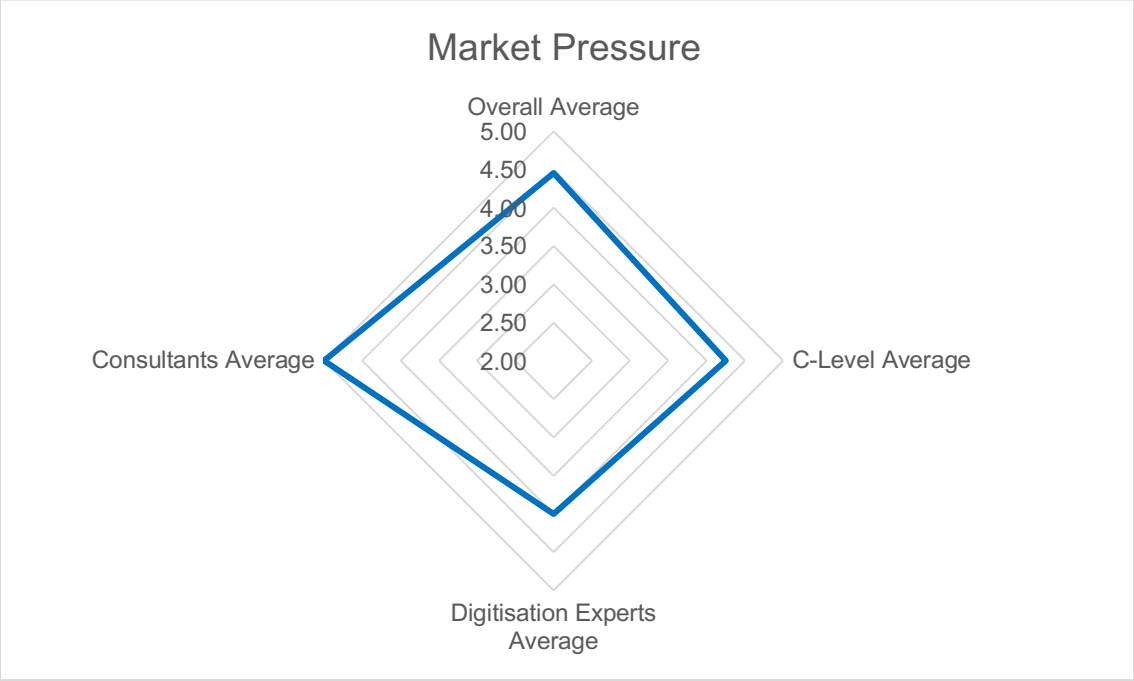


Figure 16: Detailed results of market pressure
Source: Own Illustration

Figure 16 shows the detailed result of market pressure as it rates as the reason to undergo digital transformation. The group of consultants rated its influence as very high by giving maximum points. The group of digitization experts see the lowest influence of market pressure. However, it still has a very high rating of 4,0.

Unanimously the study participants highlight the stiff competition within the market as a core reason for perceived pressure to digitize. This means that the market participants are challenged to defend existing USP's by adding additional values to their products, e.g. by data visualization or integration. The pressure is the highest, due to the high pace of development speed and the attention of skilled companies from the global market. A special form of market pressure is introduced by new market entrants with digitally enabled business models. "There is the picture of a fish farm, with lots of ponds where everybody fishes in a clearly defined area. Interestingly, the market pressure occurs from companies who originally fish in other ponds but start to look into different fields. In this regard dynamic startups have the potential to actuate the market" (Interview D1 Z97-104).

7.4.3.2. Technological Development

This section analyzes the answers of the industry experts concerning the influence of technological development.

Figure 17 presents the results of the choice based questions on technological development. The digitization experts ranked this pressure as the most relevant. Whereas the C-level experts rated it significantly below the overall average.

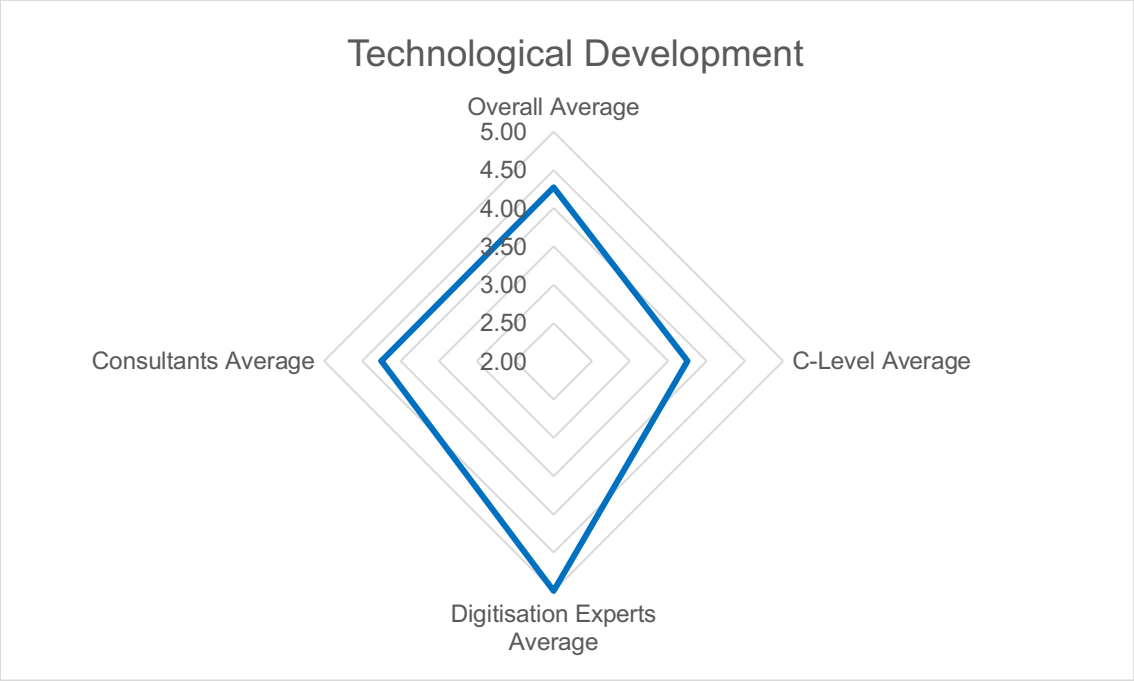


Figure 17: Detailed results of technological development
Source: Own Illustration

Technological development in the context of digital transformation is perceived as a key driver, especially among the group of digital transformation experts and consultants with a technology education background. A key argument for technology being the most important driver is the omnipresence of technology also in private life. “Technology is the new normal and integrated in daily life as for example the number of smartphone users shows….This creates a high degree of digital awareness within the society and pressure companies to face the digital challenge” (Interview D2 Z117-141).

Contrary to this technology orientated view, a group of C-level experts and consultants outweigh the importance of technology as a driving factor for digital transformation. Through their eye’s technology is the solution provider to meet the needs of a modern and interconnected business environment, and the main focus should be on identifying the ideal technology to stay competitive. “In technological development it is not about withstanding and adapting to every technology, but

much more to select the best adequate solution from a broad number of different options at the right time and intensity" (Interview D1 Z84-92).

Nevertheless, this group admits also that digital transformation technology has significant effects on the market environment. The intensive research and fast development speed induce high pressure to react.

7.4.3.3. Customer Expectation

The results provided by the study participants for customer expectation are presented in this section.

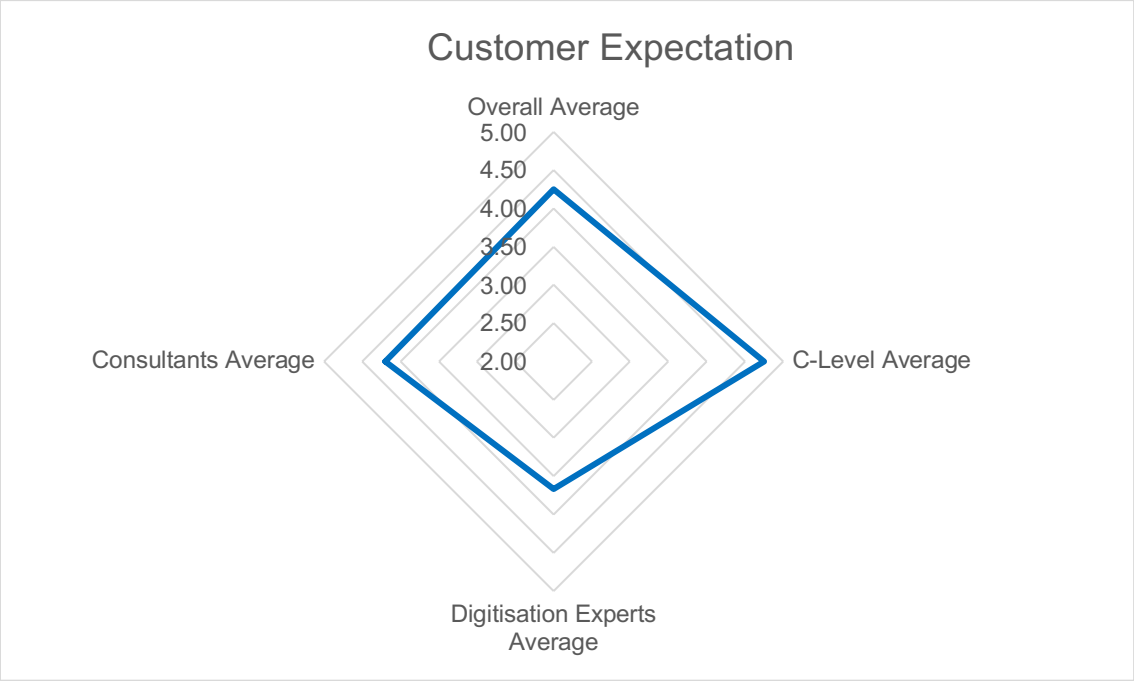


Figure 18: Detailed results of customer expectation
Source: Own Illustration

Figure 18 brings the results of the choice based questions for customer expectation into context. In contradiction to the results of the previous chapter, the group of C-level experts see the needs of customers as the biggest driver of digital transformation efforts. Whereas the digitization experts claim that this factor has a notably lower influence on digital transformation. The average for the group of consultants is very close to the overall average.

The utilization of technology is a driver of customer expectations. The majority of the participants emphasize that customers want to utilize available technologies in order to integrate them into their products. The further developed B2C world influences heavily on B2B products as smart

devices and gamification push into the B2B world. “Customers expect that all kind of machinery and production lines have easy to use graphical interfaces and exchange data within the company network” (Interview C1 Z64-67).

A second group of the industry experts identify customer interaction channels as reason for high digital customer expectations. The entire customer journey needs to be well designed and offer a broad number of touchpoints for tailored access to information or data.

Two of the study participants disagree with customer expectation being a driver for digital transformation as “customers don’t necessarily need electronic products…as new technologies wouldn’t be observable by customers” (Interview E5, 39-44) and because customers expect working solutions not directly digital ones.

7.4.3.4. Process Improvement

In the following section, the opinions concerning the role of process improvement is presented.

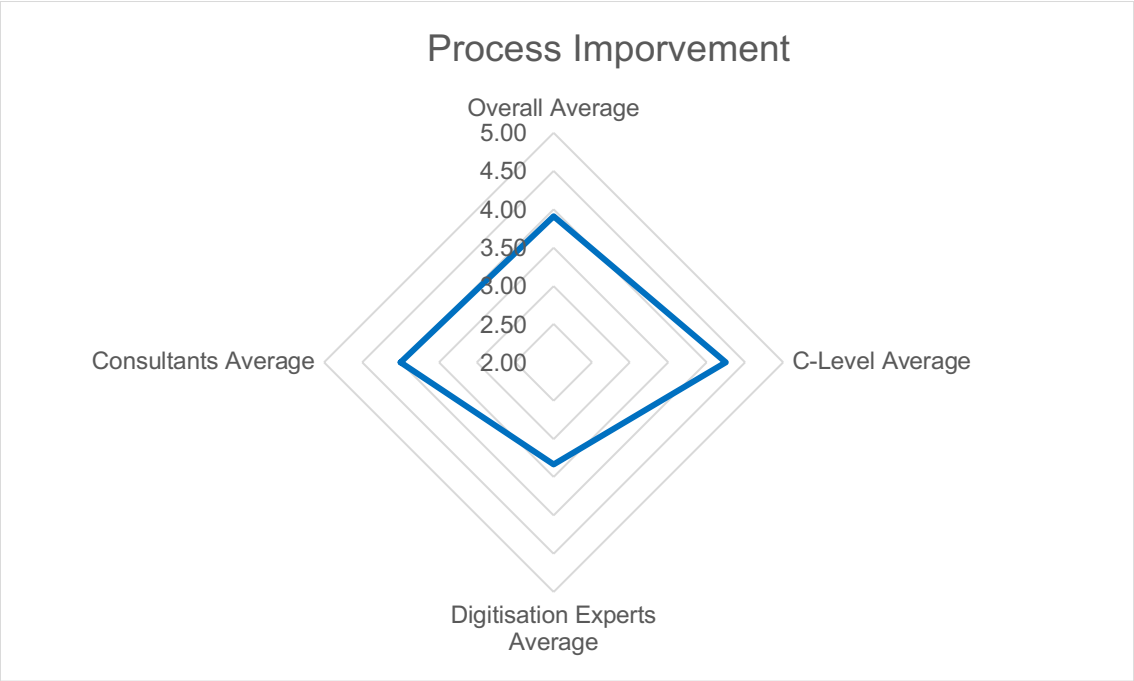


Figure 19: Detailed results of process improvement
Source: Own Illustration

This graphic (Figure 19) shows the results of the choice based question on the degree of influence of process improvement. While the group of consultants found the influence of process improvement as a pressure source close to the overall average, it is clearly undervalued by the group of digitization experts in comparison to the overall average. The group of C-level experts

gave a slightly higher value to the influence of process improvement in comparison to the overall average.

The majority of the answers show a limited effect of process improvement as a driver for digital transformation. Study participants highlight that process redesign has only limited effects on the execution of digital transformation. In this regard one of the participants highlights that "…if a company transfers not working processes into digital processes, the end result is only a digital not working process" (Interview D1 Z146-149). The same digital transformation expert continues by saying that "Processes are always grown constructs, and process redesigns aim to improve it. In digital transformation efforts a clearly pre-defined goal is a prerequisite in order to avoid too much influence from old processes in the new digital way of thought" (Interview D1 Z152-157).

Nevertheless, a minority of two C-level experts argue that process improvement is a major driver for digital transformation efforts. They claim that high R&D costs for product developments and investments for automation have to be re-earned by a cost-effective process network.

7.4.3.5. Corporate Vision

This section of the analysis elaborates the answers on the effect of the corporate vision on digital transformation.

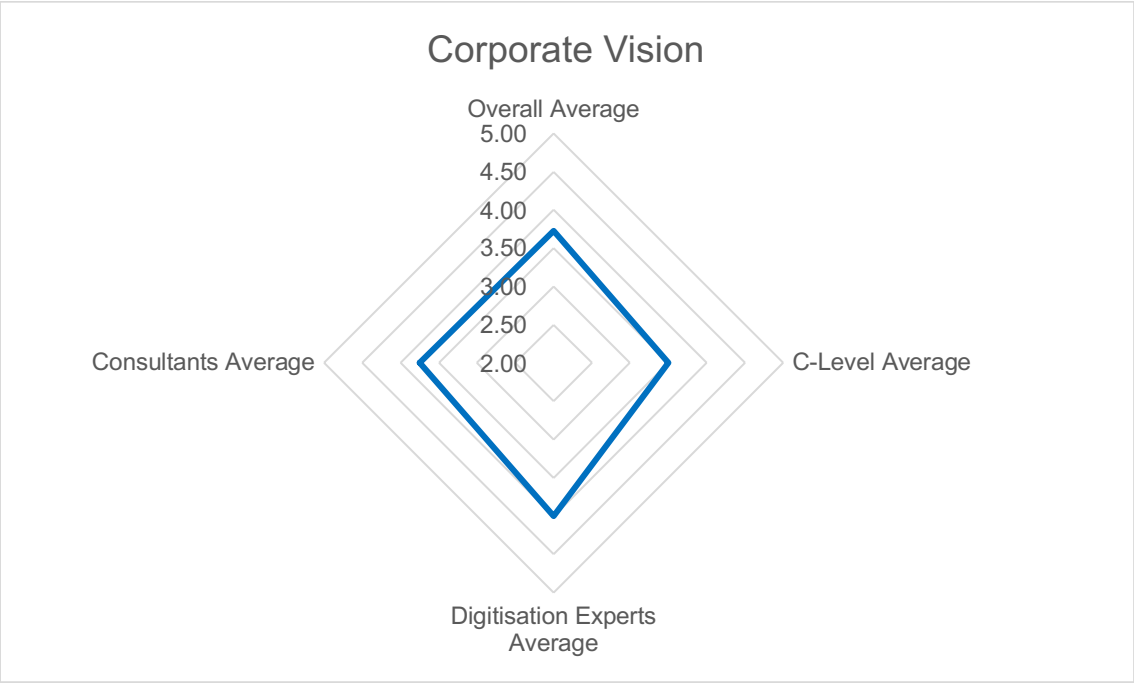


Figure 20: Detailed results of corporate vision
Source: Own Illustration

Figure 20 presents the results from the interview with regard to the pressure corporate vision plays on digital transformation for the different respondent groups and the total average. All three groups reach similar average rates and see a mid-level of importance for corporate vision pressure, without big differences between the expert groups.

The corporate vision is seen as a supportive function to drive the topic internally and was noted as present in some companies. One respondent claimed that the digitization department was developed based on the new corporate vision. In contrast, a fraction of the consultants highlight that the corporate vision did not have an effect on digital transformation efforts. In general, the insights provided for this question were kept short and were focused on the quantitative answers.

7.4.3.6. Supply Chain

The next analysis looks into the detailed answers given related to the pressure for digital transformation from the supply chain.

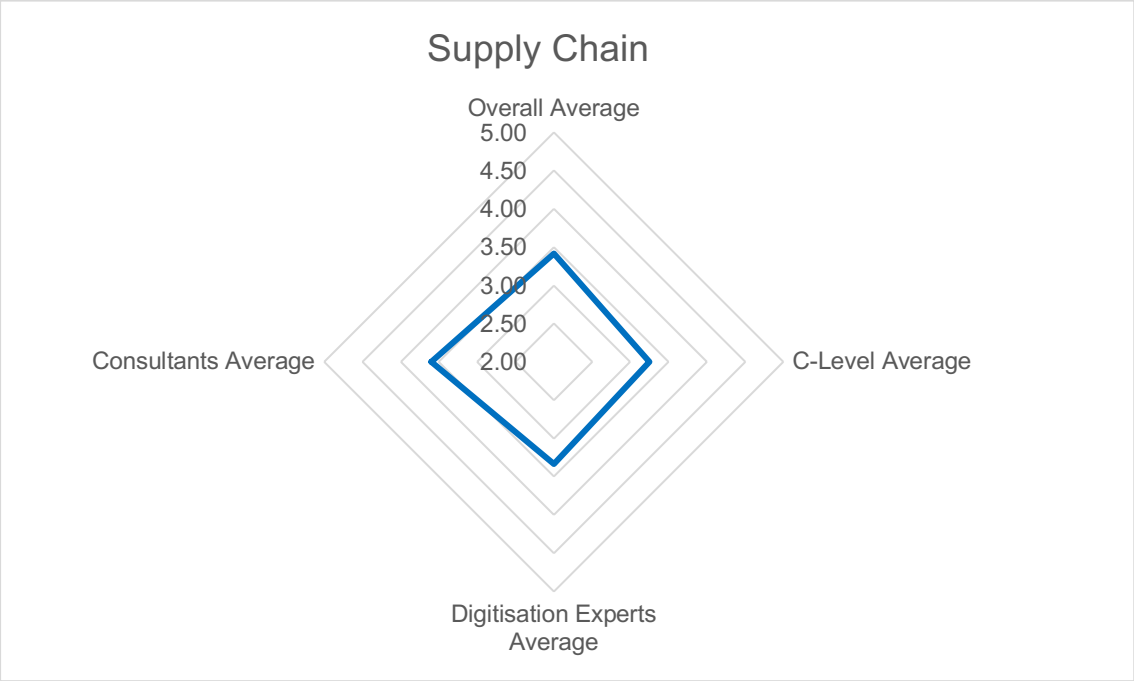


Figure 21: Detailed results of supply chain
Source: Own Illustration

Figure 21 depicts the opinions of the industry experts on the influence of supply chain pressure. The comparison shows that a low level of influence is seen for the supply chain. All four variables show similar values without significant deviations.

The responses of the interviewed experts draw a uniform picture. The experts quite commonly claimed that the digital maturity of the supply chain is not developed enough to deploy pressure,

although one expert of the C-level group pointed out that "… pressure is not perceived neither from customers nor from suppliers … as only a very little number of suppliers offers a digital integration for invoices and other data transfer. Nevertheless, slow changes are observable" (Interview C3 Z89-92). Expert E3 adds to this statement that "the production numbers are too little to set a standard for digitation in supply chain digitization, furthermore the internal maturity is not developed enough to do so" (Interview E3 Z51-54).

7.4.3.7. Cost pressure

The final chapter of this section assesses the influence of cost pressure on digital transformation.

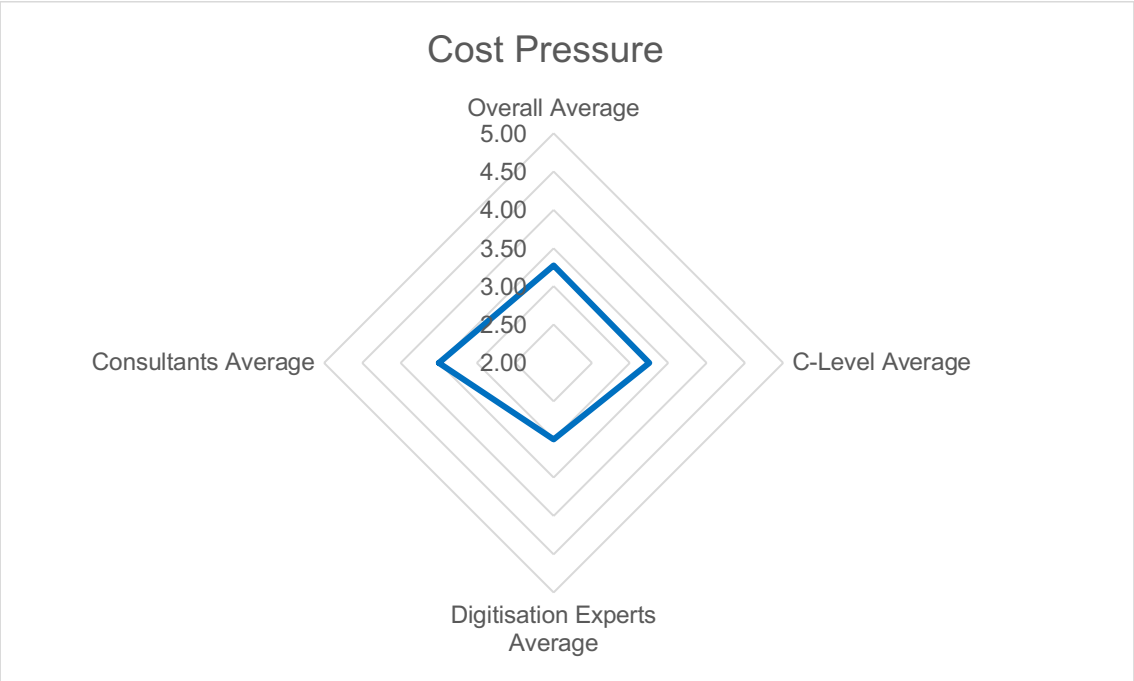


Figure 22: Detailed results of cost pressure
Source: Own Illustration

Figure 22 shows overall the least important driver for digital transformation, cost pressure. The surveyed expert groups commonly rated cost pressure on a very low level, with only little deviations.

All study participants agree on the low importance of cost improvement as a driver for digital transformation. They build their arguments on the extensive cost to run digital transformation projects. A majority of the interviewees highlight that digital transformation would never pay off in the short run due to the high initial cost that occur when undertaking digital transformation. Though expert D3 admits that cost pressure exists to some degree, the focus of the company is to "work on the efficiency of the value chain in light of digital transformation and to improve by implementing

digital transformation, to further improve the quality whether focus on cost reduction. The main aim however is to add value to the products by the application of digital technology, which puts cost reduction in a subordinated role of importance" (Interview D3 Z65-69).

One respondent from the C-level group and one consultant see cost as a significant driver, because on the one hand a broader amount of information to make qualified decisions becomes available to the decision maker by the means of digital transformation. On the other hand C4 highlights that "without extensive digitization of standard workflow tasks to reduce cost businesses won't be profitable in the future" (Interview C4 94-97).

7.4.4. Challenges of Digital Transformation Strategy

The following subchapter assesses the challenges of digital transformation by elaborating on the answers of the interviewees.

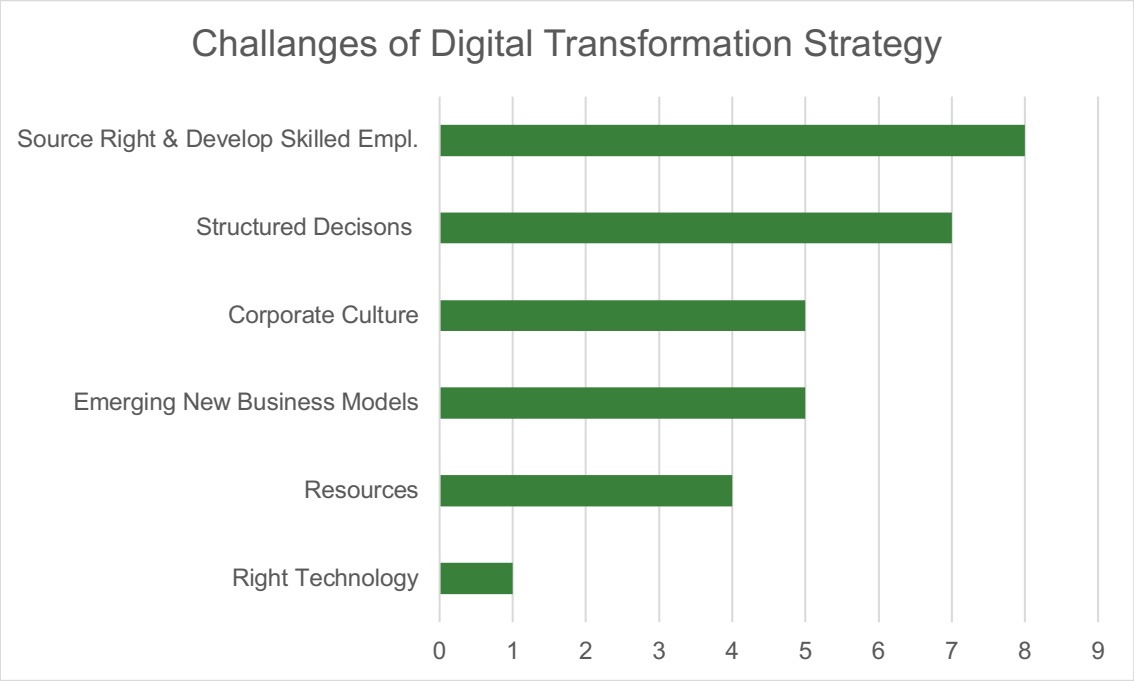


Figure 23: Challenges of digital transformation
Source: Own Illustration

Figure 23 presents the biggest challenges of digital transformation as identified by the study participants. The presented categories were derived from the inductive coding procedure executed in the analysis stage. In order the make the data comparable, arguments raised in favor of one of

the categories were counted as one point for a dimension. Multiple arguments by one expert were only recognized once. The number of categories mentioned in one interview was not limited. A pattern of answers based on the expert type is not identifiable.

In the interviews, six different categories were identified. The results show that the highest number of industry experts see the development of existing and the sourcing of new employees is the biggest challenge in digital transformation, followed by the need for structured decision making. The development of corporate culture and the challenges of emerging new business models" had a significant amount of mentions throughout the interviews. Even though selecting the right technology and sufficient resources gained the least amount attention in the graph, the categories were important enough to be raised by the interviewees and were therefore included.

As shown in the Figure 23 above, the industry experts see the challenge of employee sourcing and development as the most relevant for digital transformation. The experts emphasize the need for new highly skilled employees who are capable of facing the tasks of digital transformation. Working in digital transformation requires to the one hand "generalists who are capable to connect relevant dimensions of projects and think in an abstract and holistic way, but also people who can realize the technological problems" (Interview D2 260-269). However, it is very difficult to get people who are capable as "[m]anpower is no longer infinite, and times where employers were confident to meet their needs of new employees at any time are over. Nowadays it is a challenge to get and retain new knowledge in a corporation" (Interview C2 Z58-62).

As a second challenge regarding employees, two of the experts highlight the development of the existing workforce. The digital fitness of existing workers has to grow in order to understand the whole complexity of new tasks sets. Expert C3 sees this as extremely challenging for employees as "it would require people with A-Level education at every production machine to tap the full complexity…To close this educational gap big investments to clarify what is digital transformation about and how work in future looks like is required, in order to educate the employees" (Interview C3 Z134-137, and Z378-379).

The second most mentioned challenge is structured decisions. Interviewees who touched on this category emphasize the importance of a thoroughly set up digital transformation strategy to avoid hesitant and ineffective decisions. It requires also intense coordination and adequate decision making procedures to meet the agility of fast-moving developments in the industry. Expert C1 highlights in this regard the special development need for companies with a great deal of tradition and successful business models. "Companies who are very successful in their core competencies struggle a lot to take one step back to see digital transformation as a whole and in an abstract

way…To overcome these problems the decision-making procedures need to be updated to outweigh the resistance from very successful departments who see no need for change" (Interview C1 Z113-115 and Z 148-149).

The next most relevant category brought up by the study participants is corporate culture. "Digital transformation is not a technological problem. In the end it is a matter of cultural change" (Interview C2 Z14-15). Other experts were in line with this sentiment and also argue in favor of this point of view and identify potential contradicting goals of deciders and departments within the transformation. In this regard, the motivation of employees to participate has an important role. Further details on cultural change are evaluated in the subchapter 7.4.8 Change Management.

Emerging new business models gained as much attention as cultural development in terms of numbers by the interviewees. The experts emphasize that new technology has the potential to radically change business models and its environment as for example, "companies who operate in the project business and sell for example production plants do not longer sell the plant, but the outcome" (Interview E1 Z106-109) and decision makers need to react adequately to this development.

Four of the research participants emphasized the importance of sufficient and clearly dedicating resources to digital transformation in order to be able to effectively work on digitization, as it clearly differs from daily budget. Additionally, the expert E3, highlights the challenge of finding the best adequate technology for the needs of a company.

7.4.5. Responsibilities

As already explained in the theoretical part, a successful digital transformation requires having clearly defined responsibilities. To enhance these findings, this subchapter assesses the answers provided by the experts in the interviews with regards to clearly defining responsibilities in terms of executing the digital transformation.

The majority of the interviewees see the C-level in charge of digital transformation in order to show the willingness and the commitment to effectively transform the company. Half of this group even hold the CEO responsible for driving this issue as, including interviewee C3. "The cost of investments is very hard to estimate, and problems might occur in the process of transformation, which makes it necessary that the CEO oversees these projects" (Interview C3 Z236-269).
Furthermore, expert E2 adds as reasoning for putting the CEO in charge of digital transformation as the CEO "…has the power to drive and support the topic form the highest level of the company"

(Interview E2 Z132-133). Only expert E1 disagrees with putting the CEO in charge as he argues that digital transformation needs to be executed by the IT department and monitored by the head of IT.

Additionally, the question concerning responsibilities causes potential conflicts when responsibilities are not clearly defined and the digital transformation department is integrated into the IT department, as one of the respondent's highlights. Nevertheless, three of the experts hold the IT department as responsible for the execution. In contrast, a notable group of experts sees the importance of a specialized digital transformation department which is in the driver's seat to develop a digital roadmap and therefore it should be located on the first reporting level to the C-level. This is especially the case for matters of coordination as "the combination of a centralized digital transformation department and touchpoints in the functional departments and business units are important to ensure effective collaboration of different entities in development projects." (Interview D3 Z178-181)

Introducing a CDO to the management board is seen with a certain degree of criticism by two digital transformation officers and two consultants. They claim that on the one hand a CDO cannot digitally transform a company alone, although on the other hand the job title and position has a subordinated role. It is much more important to clearly defined responsibilities and a workflow to avoid the loss of information and sufficient influence into all relevant functional fields as coordinating entity.

An important issue raised by the interviewees, without being specifically addressed in the interviews, are employees who promote and spread the word about digital transformation in order to develop a digital mindset. Interviewee D1 argues in this regard "if the CEO just says we are going digital without sufficient working background everybody will go back to work and nothing changes" (Interview D1 Z310-313). For a successful digital transformation "it requires people who promote that topic at every employee event, every small meeting over a longer period of time and to be perceived as authentic the promoters need to come not only from the C-level but also from lower levels" (Interview D1 Z310-313).

7.4.6. Organizational Structure

This chapter looks at the answers of the study participants on organizational structure and puts them into context of overall digital transformation.

The vast majority of the responses argue clearly in favor of a centralized digital transformation department as the experts identify the need for close coordination between all involved departments as well as the involved people. “It doesn’t make sense if five different SBU’s work on similar projects which aim for the same end and none of these is perfect. In order to improve the effectivity of digital transformation, a central connecting entity needs to oversee and coordinate the executed measures” (Interview D2 Z341-345). Furthermore, interviewee D3 sees the need for centralization as “… the digital transformation department works far from the standard daily business. The digitization department is therefore granted a generous degree of freedom to test new technologies and spread new ways of working in the company” (Interview D3 Z174-176)
In addition to the effectivity reasons respondent E4 highlights that the digitization department is commonly centralized because it emerged out of the IT department which is often centralized.

Two experts raised arguments in favor of a decentral organization. First, that the functional projects run independently and have no touchpoints and also that centralization is difficult due to employee resistance as people claim, “we always did it like this”.

Nevertheless, a number of experts who argued in favor of a centralized organizational structure for digitalization efforts admit that a decentralized structure has benefits at a later stage and certain circumstances as for example interviewee D1 states. “As soon as the degree of professionalism reaches a high level, the positive effects of a centralized unit declines and decentralization makes more sense. … Not because the transformation was successful and the department is no longer needed, but because every employee thinks digital and enables therefore decentralized efforts. (Interview D1 Z299-303). Additionally, as a second argument for decentralized digitization efforts E4 claims that: “In order to executed effective agile work procedures, functional business areas will become obsolete. Companies will be structured according to products. Teams assigned to products consist then of cross-functional experts to come to a holistic solution. The advantage of such a structure is that the customer is put into the center of all efforts and responses to changes are easy to execute.” (Interview E4 Z233-248)

7.4.7. Strategy & Knowhow Acquisition

The following chapter assesses and compares the results of the choice based questions on adequate strategies to implement a successful digital transformation. Similar to the section focusing on pressure sources in digital transformation, the arithmetical average on the overall level and expert group level are used for comparison. In order to provide more details, the strategy options will be analyzed and enhanced by the insights provided by the experts.

Figure 24 shows the six suggested strategies to acquire digital skills and execute digital transformation projects. The collected answers are additionally displayed as AVG (overall average), C-Avg (C-level experts average) D-Avg (digitization experts average) and E-Avg (consultants average) in order to make the results comparable. A detailed description and differentiation of the strategy types is analyzed in the theoretical part of the thesis.

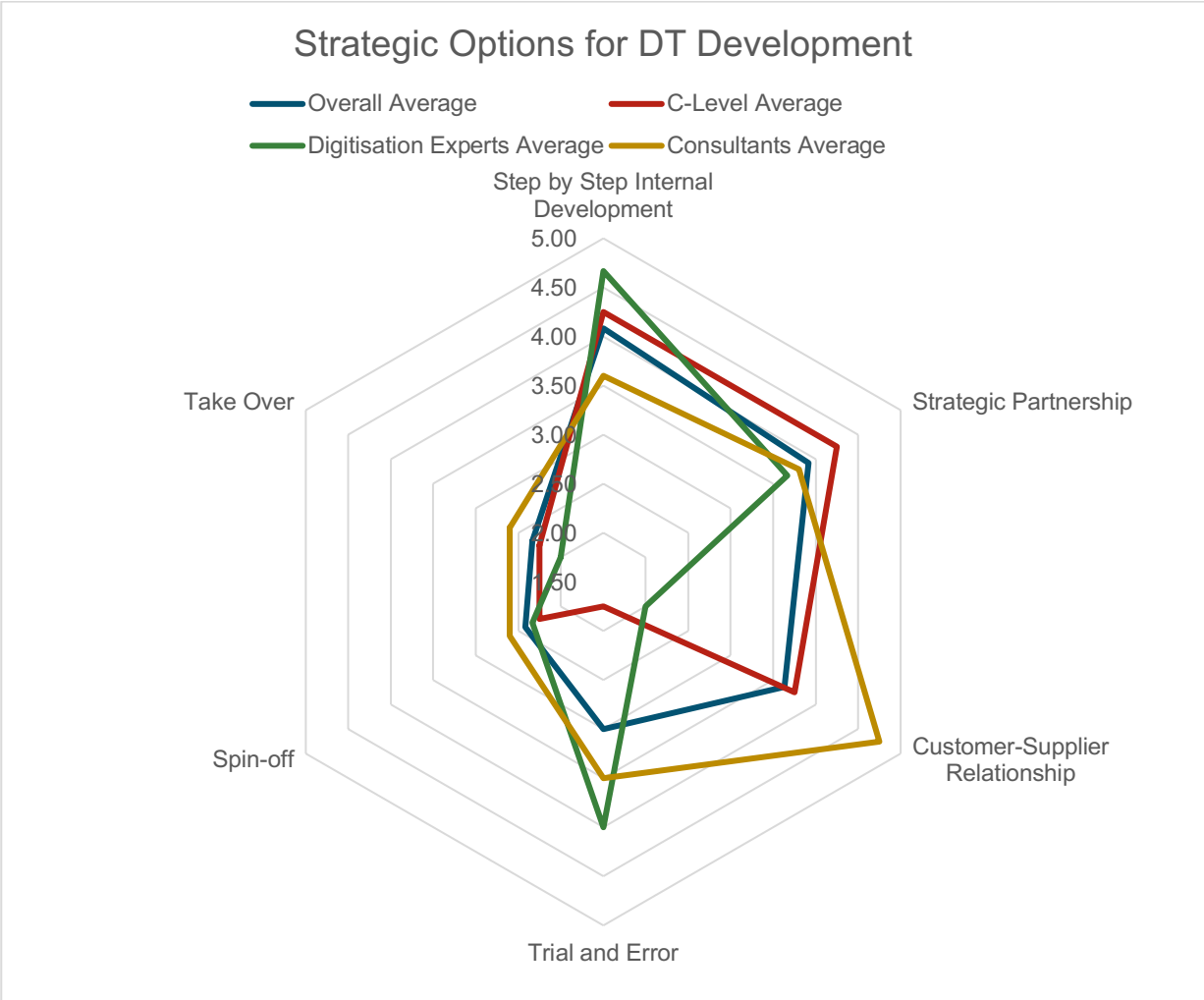


Figure 24: Comparison of digital transformation strategies
Source: Own Illustration

The experts rate step by step internal development as the best strategy for digital transformation followed by strategic partnership. For digital transformation, taking over was seen as the worst strategy listed as it was rated lowest the scale. Furthermore the experts see spin-offs also as inadequate for digital transformation as it has only an average rating slightly higher than take overs. Customer-supplier relationship as well as trial and error reach a mid-level rating but face significant differences of perception between the expert groups.

In detail, the different expert groups are rather uniform with identifying the most adequate strategies and are even more consistent with the two least applicable strategies. Most interestingly, large deviations occur on the perception of building on the customer-supplier relationship and trial and error strategies. Whereas the consultants gave the highest score for customer-supplier relationship and the C-level experts still see it rather reasonable and the digitization experts rate it with the second smallest score in the graph. In contrast, the perception of a trial and error strategy is exactly the opposite. The C-level experts rate this strategy the lowest in comparison to all others, but through the eyes of digitalization experts, it has the second biggest potential to work as a successful strategy.

7.4.7.1. Step by Step Internal Development

This chapter assesses the opinions of the study participants on the applicability of step by step internal development.

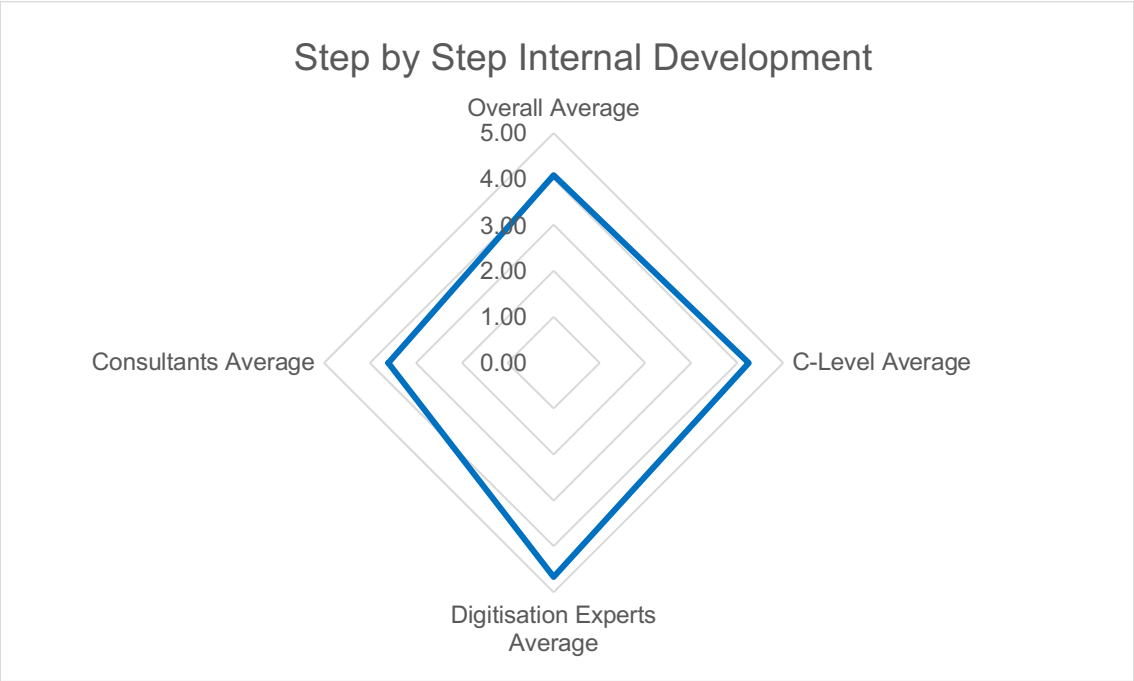


Figure 25: Detailed results of step by step internal development
Source: Own Illustration

As can be seen above, Figure 25 depicts the ratings of the strategy step by step internal development. The results show a generally very high rating for this strategy and the group of digital transformation experts see it even more relevant than the overall average for all groups.

Throughout all groups of analysis, the respondents agree that step by step internal development causes the biggest and most sustainable effects in the development of skills and abilities over a longer period of time. For example, interviewee E5 claims that “step by step development provides a fast and easy starting point, whereof a positive spirit can emerge, midterm goals can be met and a roll outcome in a later stage” (Interview E5 Z129-131).

However, the biggest downside highlighted by the experts is the slow development speed and that too many “old” things are kept in the company. "People take on knowledge very slowly to the one hand and secondly employees don’t have the capacity to take on new tasks” (Interview D2 Z234-235). Furthermore, the internal bias is a downside of step by step development as “… developments out of the daily business and experiences contain the risk to oversee important things as deciders are being used to common decision-making practice in the organization.” (Interview E3 Z264-266)

7.4.7.2. Strategic Partnerships

This section interprets the results provided by the interview partners regarding strategic partnerships and how they relate to digital transformation. The figure below presents the results of the choice based questions on strategic partnerships. A comparison of the groups shows that this strategy type is valued highly by the industry experts, without any large deviations between the groups.

The surveyed C-level experts identified the synergy effects of strategy partnerships as the biggest advantage of this strategy type. Especially when manpower and internal knowledge is scarce, it enables mutual learning and developments. As interviewee C2 highlighted that “technologies and trends develop such a fast pace that the internal knowledge-based cannot grow along the development” (Interview C2 Z213-214).

Furthermore, the experts see it as chance to develop new business models. “As analog companies partner up to develop together new business models and look for synergy effects to profit from each other” (Interview E1 Z261-263)

As for challenges, it is difficult to identify the ideal partner and find the great deal of coordination that is necessary. Moreover, one consultant sees this strategy even as “greenwashing” and not applicable for digital transformation. “Corporations between large corporates who want to work with small digitization startups don’t work because the traditional company never wanted to really transform but appear as dynamic and digital transforming company to the outside. Such measures won’t have a sustainable effect on the digital maturity of companies in the long term” (Interview E4 Z269-277).

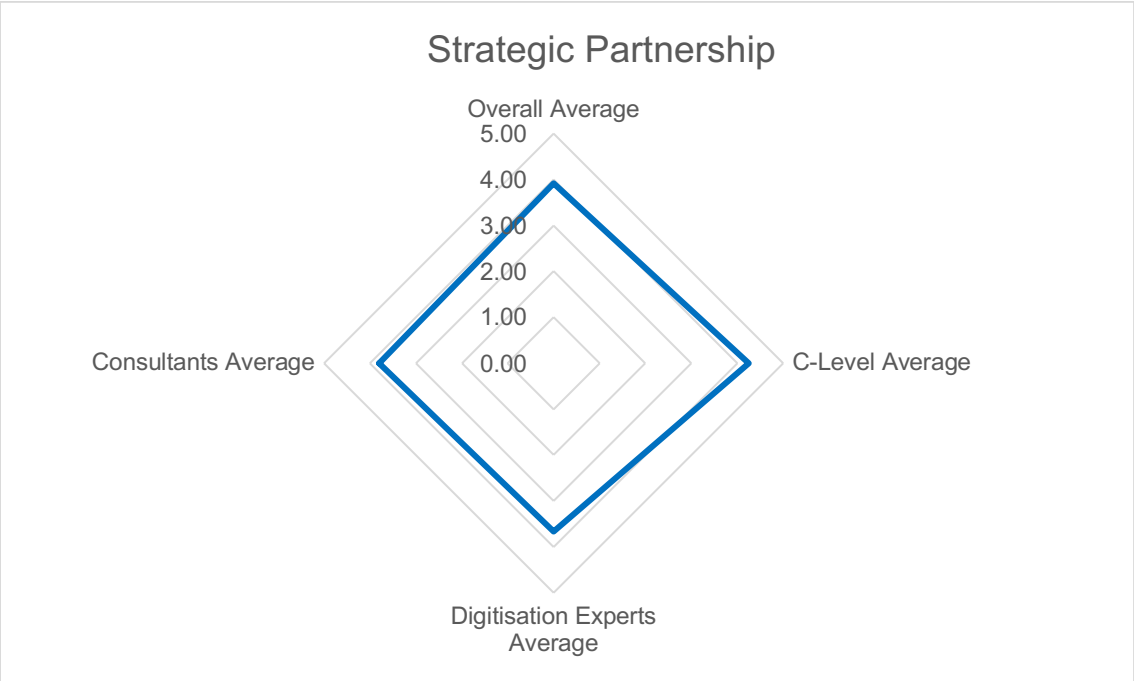


Figure 26: Detailed results of strategic partnership
Source: Own Illustration

7.4.7.3. Customer-Supplier Relationship

The next subchapter looks into the answers given regarding developing the customer-supplier relationship as a strategy for digital transformation.

Figure 27 shows the significant disagreement that exists for a digital transformation built on a customer-supplier approach. Whereas the group of consultants highly appreciate this form of knowledge acquisition and the C-level experts also rate it above the overall average, the group of digitization experts rate it with the second lowest value out of all the options.

The digitalization experts build their arguments for rating the strategy at such a low level on the desire to stay in control of developments. “Customer-supplier relationships in terms of the acquisition of components to assemble in our new products is definitely true, but in terms of

strategy we want to be in control and direct the strategic orientation of the future" Additionally, there are restrictions over long-term sustainability even though cost advantages occur: "Plug-in solutions make sense to include new solutions to the product portfolio and reduce the cost, however such solutions would reach a higher value in strategic partnerships. Furthermore, a customer-supplier relationship in form of payment for solution is ineffective as it is unsustainable". (Interview D3 Z238-244).

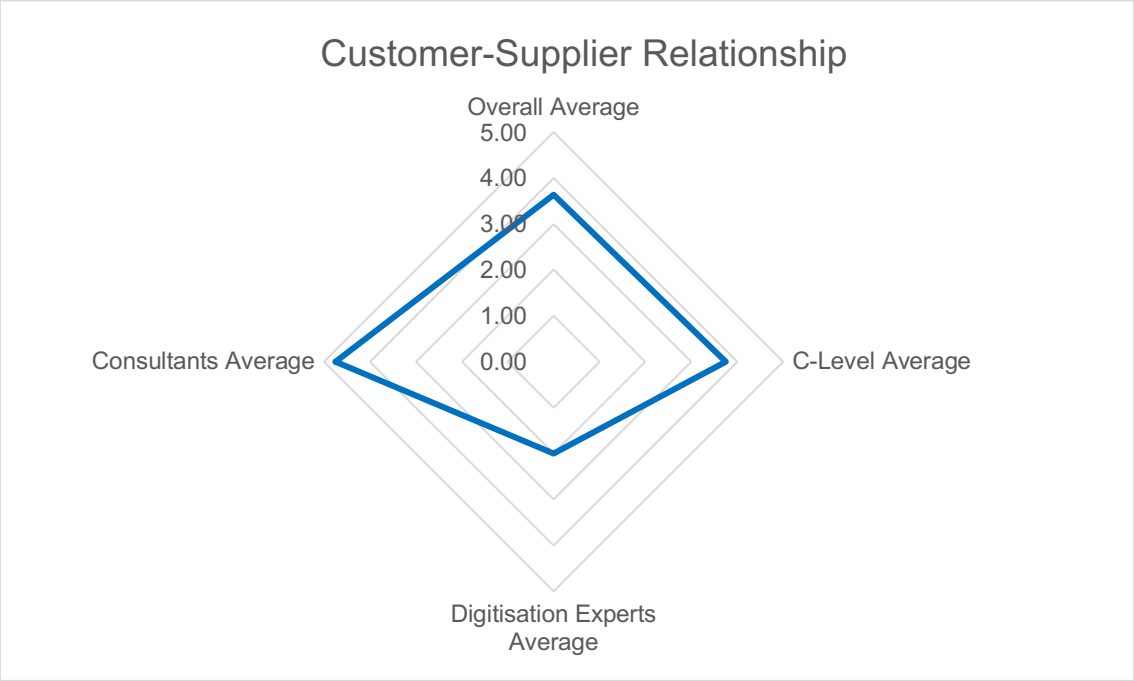


Figure 27: Detailed results of customer-supplier relationship
Source: Own Illustration

The C-level experts see the fast development possibilities and the relatively low costs for introduction as starting point stating that "at the beginning this is a good point to start the journey and cover a broad number of topics. At a later stage however the necessary skills to develop the core competencies further need to be insourced" (Interview C1 Z227-229).

The group of the consultants see this strategy as the most positive as they understand it as a source for acquiring new competencies and learning, but still see the constraint as having no effect on the company itself. "A customer-supplier relationship is for me personally the most adequate as it contains zero risk. A digital solution can be bought and easily implemented and immediately sold on the product level. Nevertheless, on the company level such an approach has only little effect." (Interview E1 Z245-248). Along the same lines, Interviewee E3 adds, "..the customer-supplier relationship helps to bring solutions faster on the way as sustainable strategic partnerships are harder to identify" (Interview E3 Z308-309).

7.4.7.4. Trial and Error

The following section evaluates the answers given on the strategy of trial and error during the interview sessions.

Figure 28 displays the calculated averages from the choice based questions on trial and error. The average results diverge significantly as the C-level experts rate this strategy type lowest overall, whereas the digitization experts rate it the second most relevant strategy in comparison to the others.

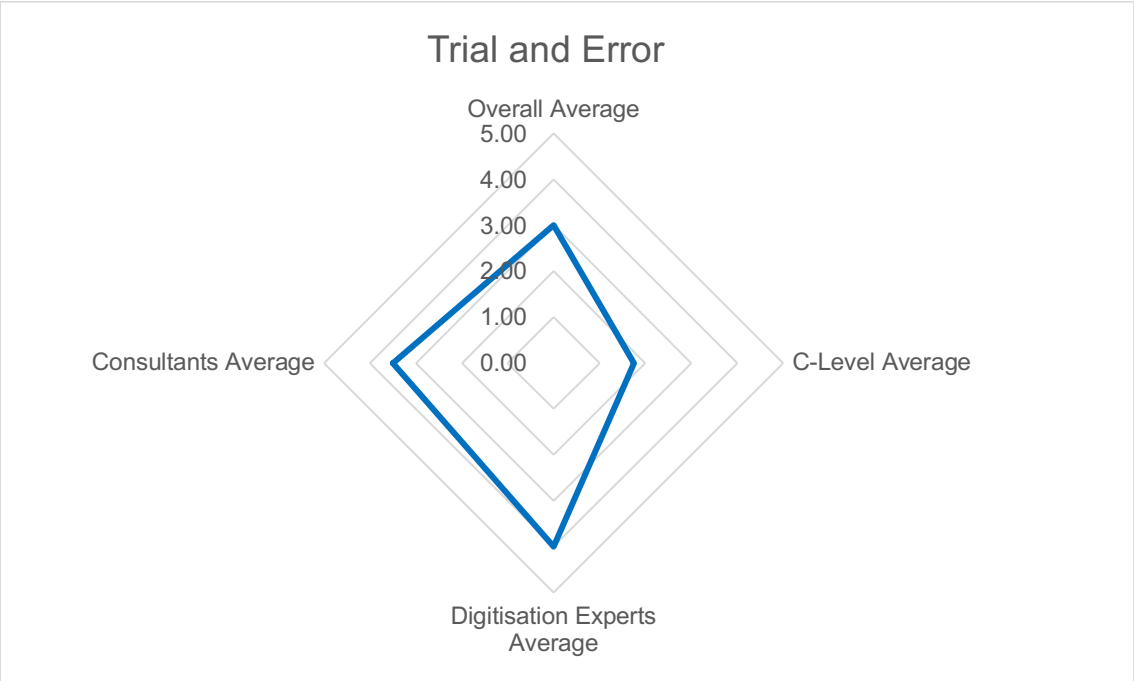


Figure 28: Detailed results of trial and error
Source: Own Illustration

For the group of digital transformation experts, this form of strategy gives the opportunity to acquire new skills by trying out new things and supports the transformation as “the acceptance of failure and the ability to draw conclusions out of it significantly supporting the cultural transition” (Interview D1 Z 343-348). D2 made a similar statement to this but raises concerns that “too many big mistakes would endanger the long-term success (Interview D2 Z396-397).

In comparison all respondents of the consultant group also understand this strategy as ideal basis for learnings: “In the beginning the starting point is one department or project, if everything is running successfully the project is expanded. If the project is not running successfully, the rest of the company is at least not threatened” (Interview E4 Z398-402). As soon as the project is running successfully, E2 emphasizes “…that the roll put and upscaling process of the project is realized fairly easy” (Interview E2 Z223-224).

A contradicting opinion is raised by the C-level experts when it comes to the strategy of trial and error. In general, the respondents see mistakes as dangerous for the long-term success of the company. “We cannot afford any mistakes. The industry regulation and the market paradigms force us into a zero-mistake policy. A trial and error strategy might be acceptable in a thinktank but not in our industry” (Interview C4 Z196-198).

Additionally, interview partner C3 claims that trial and error leads to projects which are not thoroughly planned and the execution leads to results which are disappointing to the entire company. “Especially in an IT environment the potential damage is so big that an 80% solution is realized, as we had the experience with one of the past projects. In order to avoid such bad projects, we need to put more energy into project planning and need to develop a clearer vision of what we want to achieve in the future” (Interview C3 345-355).

7.4.7.5. Spin-off

Spin-offs are the focus for this section and the strategy is looked at in more detail as to if the interviewees deemed it a suitable strategy for digital transformation.

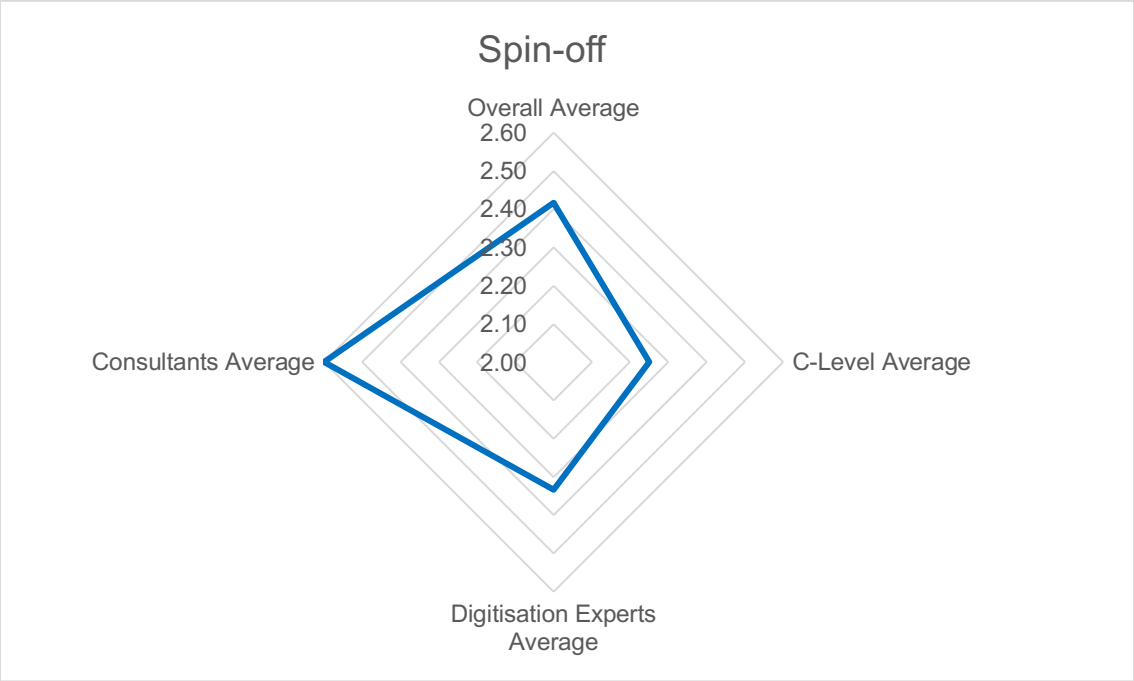


Figure 29: Detailed results of spin-off
Source: Own Illustration

Figure 29 above highlights the answers given by the experts. As a general conclusion, it can be said that the strategy spin-off is generally rated on a low level. Also, the comparison of the different expert groups shows a uniform, but a very low picture with only very little deviations.

A primary group of respondents sees spin-offs as a good source for experiments and tests. However, the interviewees claim that it has no long-term effect on the corporate culture of the mother company as for example interviewee E4 claims, “When introducing a spin-off, the challenge is to find the balance between development without any restrictions and enough closeness to the parent company, as in our industry relationship and trust plays a very important role” (Interview D1 Z332-338).

A second group sees even fewer advantages to introducing a spin-off as a strategy for digital transformation as the high degree of individuality has no positive effects in terms of digital transformation to the parent company. Expert E2 sees it even more negatively and states that “spin-offs bind skilled high preforming employees who should better be integrated and retrained into the company” (Interview E2 Z211-212).

Another group of respondents placed significance emphasis on that a spin-off does not fit the corporate strategy and is therefore not an option. At the same time, two of the experts saw a positive side on spin-offs as these small and agile companies have the ability to grow faster and test business models with different scalability.

7.4.7.6. Takeover

This subchapter analyses the last option of the choice based question on strategy for digital transformation.

Figure 30 below puts the results given by the industry experts into relation with each other based on group type and overall average. The comparison shows a very low level of fit as the right strategy for digital transformation. Furthermore, all of the survey expert groups jointly agree on this low value.

The main argument for rating the takeover strategy on such a low level is the high complexity of M&A activities itself. This was the most common comment made from members of the consultant group. Interviewee E4 claimed that “A takeover is complex and difficult. The integration of culture, technology and processes bind so many resources, that there are no capacities left to focus on digital transformation projects” (Interview E4 259-262). Additionally, in this regard interview partner E3 raises the example, “As digital transformation is a continuous process, no radical measures are necessary, especially not in the form of an acquisition, as large companies won’t buy companies for process digitization as no value occurs to the company as a whole” (Interview E3 228-231).

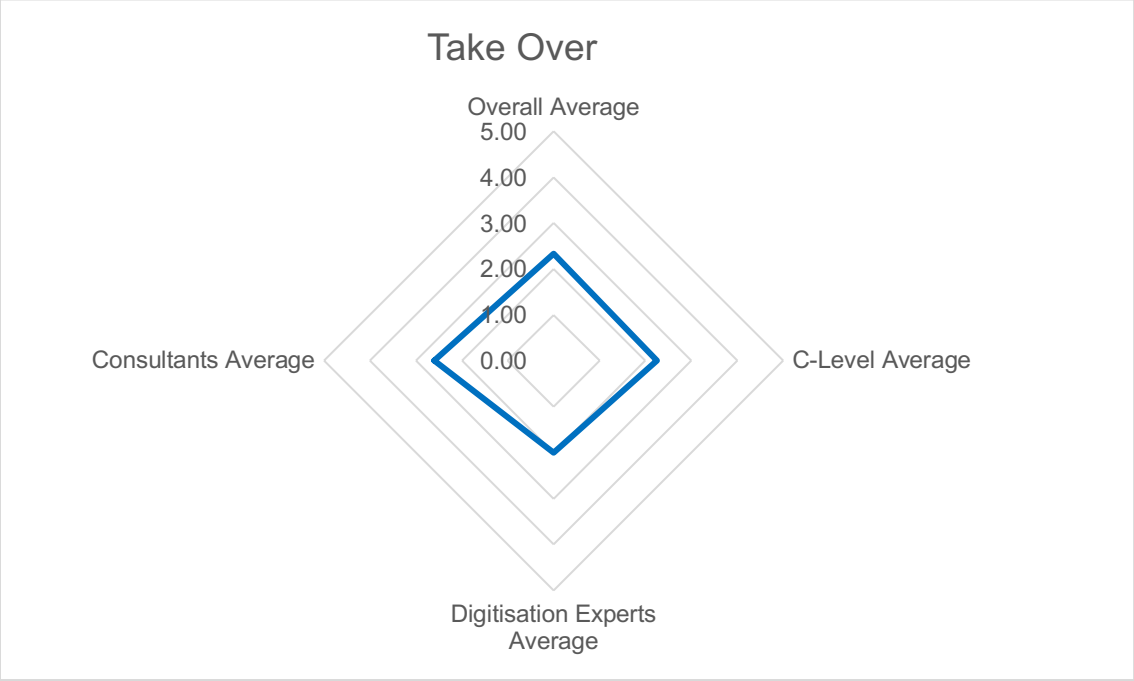


Figure 30: Detailed results of takeover
Source: Own Illustration

The second group, which consists of C-level experts and digitization experts, raises concerns against the suggested strategy as they see no positive effects on the corporate culture by mergers and acquisitions. Interviewee C1 finds a reasonable explanation for the arguments: “Finite working solutions or companies, which are integrated into companies will remain a closed entity to the buying company. The integration of the new entity into existing structure is very difficult, as a separation of the department would lead to a loss of knowledge. Therefore, this strategy is more like ‘greenwashing’, as it does not really support the digitization process as a whole.” (Interview C1 197-202). In addition to the cultural challenges, interview partner C3 sees also cost as issue, as acquisitions are too expensive measured on the benefit gained out of it.

As the only expert who noted also a small degree of positive effect of takeovers, interviewee C2 sees this strategy as it as a source of knowledge and states that “… in digital transformation it is impossible to develop everything inhouse” (Interview C2 Z204).

7.4.8. Change Management

The following chapter assesses the insights provided on change management in the context of digital transformation. The applicability of existing change management tools is assessed and the needs for change management needs in a digital future are evaluated.

Concerning the applicability of traditional change management tools as presented in the theory part of this thesis, one quarter of the experts interviewed argued in favor of these models and see them also relevant for the future. “As digital transformation is also a change process, traditional tools will definitely help. However, it is important to adapt to the increased intensity of digital transformation” (Interview E3 Z326-330). Additionally, interviewee E4 sees that “..the methods of training, for example training on the job and so on, will remain mostly unchanged, but the content will look different in the future” (Interview E4 Z443-446).

In contradiction to these arguments, two quarters of the experts clearly argue in favor of the need for new change models as existing models cannot cope with the increased pace of development in digital environments. As interview partner C2 sees that companies struggle with agile project management tools there is the need for adaptation, because traditional models cannot cope with the required agility. A second argument for new change models highlights this group the infinity of the digital transformation as “traditional change programs have typically a clearly defined goal. The challenge is that the digital transformation has no clear goal yet” (Interview D1 Z374-375).
In order to meet this challenge of continuous management, one of the experts adds that change efforts need to keep the momentum and stay moving to successfully change. Figure 31 presents the number of occurrences of the inductively generated codes on change management by the interviewees. Multiple responses on one code by the same interviewee were only counted once, but no limits to the number of different codes were given.

The most attention was for the code mindset of employees followed by ongoing management and communication, whereas resistance to change gained the least attention. Arguments that emphasize the relevance of time, emotion management and corporate culture were mentioned just as often. Issues concerning generations were mentioned by four experts.

The interviewed experts view the importance of the mindset of employees as so important as it builds the basis for the cultural transformation. They see the employees as a relevant dimension for success. Without a sufficient degree of willingness, the transformation is impossible. Despite the overall positive attitude required for a positive development, interviewee D1 claims that “it requires at least 10% of radically thinking and willing employees to realize the transformation efforts” (Interview D1 Z275-277). As a specific solution to create such a digital mindset, interview

partner D3 states that “employees get the chance to work outside of daily business and with more freedom on innovative projects….We hope to motivate and mobilize employees to develop new ways of thought. This program is not limited to people who are in touch with technology every day” (Interview D3 Z260-268).

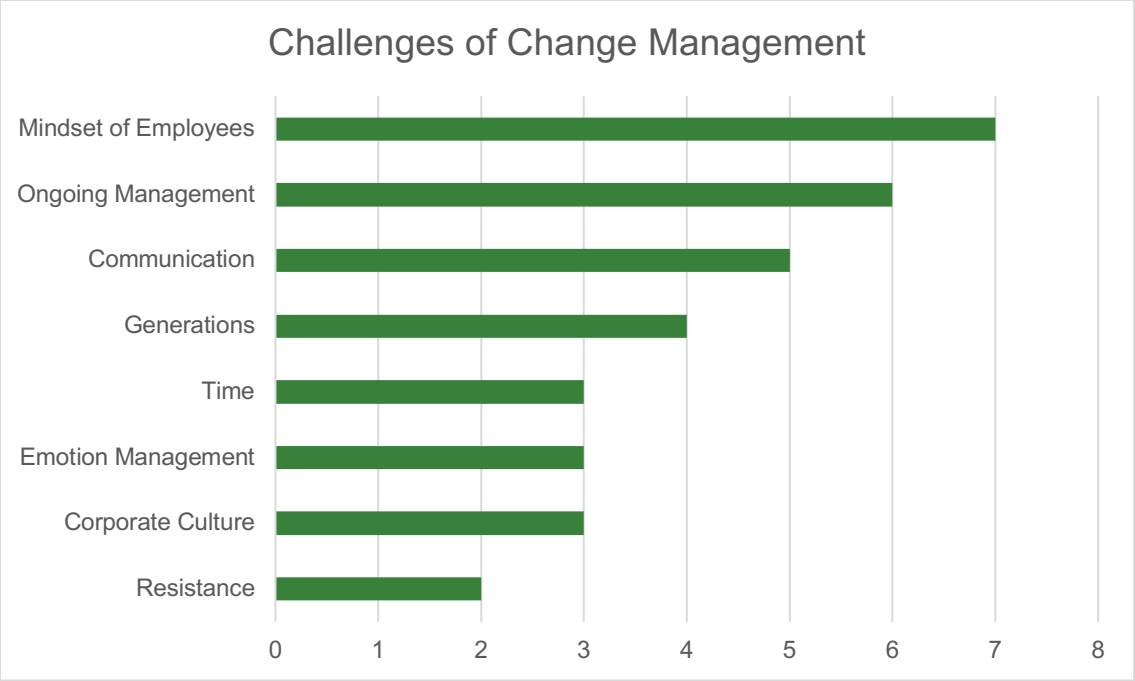


Figure 31: Challenges of digital change management
Source: Own Illustration

As the second most important dimension, the continuous management of change gained significant attention. This dimension gained the most attention from the group of consultants. All three respondents of this group highlight the importance of ongoing management and that digital change is the new normal and has to occur on a day to day basis involving every individual. Whereas other respondents highlight the need for adequate planning and learning.

Regarding the need for communication, all interview partners see that communication is a prerequisite for successful transformation and interviewee D1 states that “From the change management point of view commitment and transparency is required. Furthermore, spreading the word in face to face meetings and digitization events of different size help to promote the topic” (Interview D1 Z398-401).

Digitization brings up significant challenges for change management also on the generational level as suggested by the experts. The arguments which were raised show that change management needs to deviate between digital natives and older employees with less digital experience.

Whereas digital natives do not wait to get training on new technologies, as they acquire new skills for example by YouTube tutorials. At the same time, employees who have less experience with digital tools need more support to acquire new skills and manage the transformation.

Even though three of the experts see the time and speed factor as relevant for the future of digital change management, all three arguments go in different directions. In light of the transformation stages of Lewin (1947), the expert C2 states that there is no time left to unfreeze as the development speed is so high. Interviewee C1 however claims that the fast development speeds force change management into continuous development. Contradicting to this opinion is the perception of interview partner E2 who argues in favor of a step by step approach and to invest sufficient time for development.

Experts who mentioned the effects of emotions in the digital transformation highlight uniformly that the factor human has an important role and that adequate management of emotions has to be in place. “In digital transformation change management, the human factor needs more attention, because there was no change with such a high degree of uncertainty in the last decades” (Interview D2 Z450-453). To overcome this challenge, it is suggested by interview partner E3 that “… the intensively occurring change curve (ass. 7 Stage Model) needs to be managed with a sufficient budget and enough time to enable a transition” (Interview E3 Z123-126).

In the context of the development of corporate culture, the answers suggest that a change in corporate culture is very hard to achieve and takes a significant amount of time. In the context of digital transformation and the acquisition of new knowledge, the development of a culture of failure is important in order to detect failure earlier.

The final code developed in context of change management combines statements on resistance. The two respondents from the consultant group highlight anxiety of job loss and a mentality of “we did it always like this” as a source of resistance.

7.5. Discussion of Results

This subchapter aims to interpret the previously elaborated findings of the empirical study and discusses the findings in light of digital transformation. Furthermore, this section provides the answers to the proposed research questions and enhances the existing literature.

In general, the answers from the interviews show that a significant degree of uncertainty exists, and a common understanding of digital transformation is still missing among all groups of industry experts, as every participant had their own individual interpretation. Nevertheless, the answers claim that the digital transformation has intense influence onto future business success and is seen clearly as “die factor” for the future. The degree of transformative pressure is highly dependent on the degree of digital maturity of the industry. However, digitization efforts are driven by market and technological developments, through the eyes of the interviewed experts. As the most suitable strategy to execute digital transformation projects, internal step by step development gained on average the most attention, as it develops the required skill and knowledge base as well as the corporate culture. For a successful realization, the agendas of digitization need the attention and commitment of the CEO and/or CDO and a centralized entity to spread the digital mindset throughout the company and run transformation efforts with sufficient resources and sustainability. Nevertheless, the key results of the expert interviews are that digital transformation is not a metamorphosis from an old-school player in the industry to a dynamic digital company. Much more it is an infinite process which requires full commitment of all fields throughout the whole company, continuous development of the workforce and ongoing internal learning.

7.5.1. The Intensity of digital transformation and its pressure sources

The answers of the industry experts confirm the provocative title of this thesis, as digital is seen as the new normal and effects will occur throughout the whole company. For companies of the whole economy this means that proactive measures and learning have to be started as soon as possible in order to avoid the loss of corporate advantage due to missing integrability into future value chains and market paradigms. Furthermore, the digital transformation will not happen overnight, many more little development steps are required as the company and the workforce needs to be prepared and trained for the new paradigms as digital transformation is not a closed process which is finished at some point. Much more it is a continuous process of measures that improve the digital maturity of a company.

The results of the choice based questions confirm the perceptions of the theory only to some degree. Nevertheless, market pressure is the key driver for digital transformation. The expert groups rated it on average the highest, as well as the literature results of Christensen and Brower

(1996), Paap and Katz (2016) and Ramdorai and Herstatt (2015) suggest. The findings from Adner (2002) claim that technological transformation pressure emerges out of changed customer needs and values. This statement would rate customer expectation as the second most important driver. Controversially, the industry experts rate technology as the second biggest driver of digital transformation over customer expectations. Furthermore, the detailed intergroup comparison unveils a significant disagreement between the expert groups as all three groups rated different pressure forms as the most important. This demonstrates that no common agreement on the paradigms of digital transformation has been reached so far and the perception of important factors is highly specific to the education and job background of deciders. In this regard can disagreement occur as hindering factor for successful digital transformation as involved deciders might build rationality on different pillars, which leads to disagreement and bad decisions.

7.5.2. Relevant Paradigms of digital transformation

The comparison of the theoretical findings to those of the empirical study shows significant disagreement. Theory is concerned about organizational factors, such as finding the right technology and the introduction of digital transformation efforts in a holistic way. The industry experts focus much more on a solution oriented approach. In regard of managerial considerations, the researchers Kreutzer et al. (2018, p. 47) and Westerman et al. (2015, p. 100) emphasize the importance to have a corporate vision in place in order to guide the way. In contrast, the interviewed experts identify the workforce, structured decisions and corporate culture as the most challenging factors. Due to the high complexity of digital transformation, digital talents are urgently needed but very scarce. The answers of the experts show that a big share of success in digital transformation is built on the ability of the workforce. In line with the theoretical findings of Buchanan (2016, p. 7), the experts claim that employers have to invest in new employees who have the potential to either be a technology expert or have the potential to tap the full scope of digital transformation. At the same time, the limited availability of skilled people requires investing and developing existing workers in order to ensure that they are able to run and develop digital products. The great amount of attention towards structured decisions might be connectable to the already mentioned uncertainty that exists in this context. Fast developing and unforeseeable technologies make it difficult to select the right solution. As suggested by the experts, the solution is not based on finding the ideal technology, but much more building on a thoroughly planned transformation strategy that takes considerations of all influencing fields into account.

The holistic evaluation of the statements on challenges of digital transformation prove the high degree of complexity and diversity of digital transformation. The dimensions presented in Chapter 6.4.4 influence the company at different touchpoints such as workforce, decision making,

resources and influences from the outside. This broad set of influences underlines the far-reaching scope and the necessity of not only focusing on one issue. In this regard, companies need to integrate digital transformation in the DNA of the organization and incorporate it into all important planning activities.

Piloting a company through digital transformation is a challenge of its own which requires intense coordination. The interviewed experts see the C-level, and in detail the CEO, in charge of doing so due to the decision making competence. The findings of the literature also allocates this task to a position on the management board, for example Horlacher and Hess (2015, p. 5126) clearly argue in favour of introducing a CDO to take over coordinative tasks and to profit from a certain degree of freedom and focus only on digital transformation. Whether introducing a CDO or not is therefore dependent on the digital intensity and the structure of the company. If an organization is very immature and is at the starting point of the digital transformation journey it is sufficient that the CEO is in charge and oversees the projects. At this point the digital projects can profit from dynamism in decision making due to the closeness to the CEO. However, as soon as digital transformation gets a notable amount of attention in the organization, the introduction of a CDO is suggested in order to tap the full complexity and the far-reaching scope as discussed previously. Nevertheless, no matter if a CDO is introduced to the management board or the CEO takes over the responsibilities of digital transformation, the empirical results indicate that a CDO/CEO cannot transform a company alone. To successfully navigate this challenge promoters on all levels of the company and strong digital department have to spread the word. Only when a number of employees are committed to change successful transformation will occur.

In terms of the organizational structure, the overall results see, especially in the beginning, the centralized model as the most favorable organizational from as it combines all transformation efforts in one entity which can be organized closely to employees with decision making competence. Furthermore, it ensures that no two-pronged developments are driven forward. At a later stage and at a reasonable level of digital maturity, the reduction of coordination needs is expected. For the organizational structure this means that competences might be handed down to SBUs or the whole organization is organized along products and cross-functional teams which enables high agility to adapt to customer needs.

In order to manage a successful transformation, an adequate strategy for realization and knowledge collection is required. The results of the interviews show that incremental step by step development is the most applicable form of the suggested strategies. The core advantage of the strategy is the sustainable and oversee able pace of development. Staying in control of the transformation efforts without being dependent on partners or suppliers is seen as important by

the experts. Furthermore, it can also be seen as a form of risk aversion, as the failure of small transformation steps has less potential to harm the company. Nevertheless, supportive incremental steps, internal learning and knowledge acquisition of the whole workforce helps to develop the corporate culture continuously. The apparent lack of correlation between the C-level experts and the digitization experts on the trial and error strategy show the different perspectives of interviewees. Whereas the digitization experts see the strategy type as source for new knowledge, easy learning and employee development, the C-level experts state that this learning form is not adequate for transforming the company. The underlying reason for this might be that C-level experts have to ensure the long-term survival of the company and have to run a profitable business. Furthermore, they need to justify failure to the owners. At the same time, it is the job of digital transformation experts to drive technological development and learning within the company. All in all, this shows again the need for a balanced focus on providing enough agility to enable digital development and detailed planning in order to work towards a common goal.

The results of the interviews show that also change management has to take the next development step to meet the requirements of digital transformation. Even though traditional models such as the seven stages of emotions (Hayes, 2014) are still applicable in its essence, change management models need further development. Where for traditional change models the process ends at a certain state, digital change is a continuous cycle of improvements and internal learnings. The derived categories from the interviews suggest that the essential dimensions in digital change are the mindset of the workforce, ongoing management and communication in order to reduce anxiety and uncertainty.

8. Conclusion

As a conclusion the evaluated results, from the literature analysis as well as the empirical findings show the far-reaching scope of digital transformation and the underlying complexity.

The primary goal of this thesis was to gain insights into the paradigms of digital transformation and understand the intensity, speed and sources of transformation pressure as well as the influencing factors for a successful digital transformation by answering the proposed research questions in form of a hypothesis. The relevant information was collected in a two stage research process. A thorough literature review built the basis to draw conclusions. The 12 semi-structured interviews with CEO's, digital transformation experts and consultants, were used to enhance the existing literature and gain indepth industry insights.

Research Question 1:
Where does digital transformation pressure emerge from and is digital transformation a "Die Factor"?

Research Question 2:
How do companies digitally transform to maintain the competitive advantage from disruptive innovations and changing markets?

The answers to the first research question are elaborated predominantly in Chapter 6.6. The results prove the title "Digitally Transform or Die!", as companies have to take actions in order to do not lose competitive advantage due to the high development speed. In terms of development, intensity digital transformation develops in incremental steps and not overnight. Furthermore, the market was identified as the biggest source of pressure in digital transformation. The disagreement between the interviewed experts on the greatest pressure sources highlights the complexity of digital transformation and the strong influence of personal perception which leads to great need for coordinated efforts.

The second research question was answered in detail in chapter 6.7. The conclusion out of the discussion is that even though digital transformation is built on technology, it is not about identifying the perfect technological solution. Digital transformation is built on a thorough transformation strategy that takes all relevant parts of a company into account and works especially on the internal development of the digital DNA of the company. Furthermore, digital responsibilities need to be allocated either to the CEO, who profits from agility in decision making,

or to a CDO, who is able to focus on digital efforts and coordinates them throughout the company. In order to successfully complete the transformation, promoters across all company levels need to support the transformation process by spreading the word to create a positive attitude towards digital transformation. Moreover, companies digitally transform by having a centralized digital transformation department which is organized closely to the management board. In regard to the ideal strategy, the analysis claims that companies want to be in control of their digital transformation efforts and rated therefore step by step incremental development as the most suitable transformation strategy. As core advantages, the limited risk of failure, the manageability and the development of the corporate culture are identified. Finally, also change management has to be adopted to the paradigms of digital transformation. In order to achieve sustainable results in digital transformation, change efforts have the aim to develop the corporate culture on a continuous basis by comprehensive communication to reduce uncertainty and anxiety as well as the ongoing management of the workforce.

All in all, can be concluded that digital transformation contains a certain degree of uncertainty on all organization levels. Nevertheless, it is clear that digital transformation has a significant influence on the long-term success of the company. Furthermore, the transition from analog to digital does not occur all in once, but in incremental steps. The most relevant factors for a successful transformation are therefore a balance between thorough planning and agility in decision making. Additionally, open communication and intensive efforts into the development of the workforce have to be taken.

8.1. Limitations of the Thesis and Future Research fields

Even though extensive planning was invested to develop a research methodology which is capable of covering the broad field of digital transformation, the thesis contains limitations. This chapter outlines these limitations and provides suggestions to overcome them.

The limitations arise most commonly from the research design. As the research methodology aims to draw a holistic picture of digital transformation, the research participants were not specifically from one industrial sector. For more specific and detailed insights into one industry the research field would profit from a specific industry research. Furthermore, the number of interviews conducted was relatively little to gain reliable results from the choice based questions. In order to overcome this limitation, a quantitative analysis on sources of transformative pressure and digital transformation strategies would deliver extra benefits. Even though the chapter on change

management found important factors for the change management in the context digital transformation, direct managerial implications were not developed. Additionally, the thesis did not describe the selection of technology process and the underlying challenges in detail.

In order to improve the knowledge base further, the limitations bring up two suggestions for further and even more detailed research. As mentioned in the theory section, the selection of technology is not assessed in this thesis. Nevertheless, the findings of this paper highlight the relevance of having the right technology in place. Therefore, future research should investigate the process of technology selection in companies and the underlying processes and influencing factors. Also, change management holds significant room for further research. For future research, the main interest should be but on how companies transform from a traditional change management process to corporate culture that enables continuous adoption in light of agile organization development.

9. Appendix

9.1. Bibliography

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9.2. Interview Guideline

	Questions	
Warm-Up	How would you define „digital transformation”?	
Transform or Die!	Digitally Transform or Die? How critical for the future success is digital transformation? No DT = no future success? Where does digital transformation pressure emerge from?	
	Please rate	I don’t agree I fully agree
	Customer expectation	① ② ③ ④ ⑤
	Supply Chain	① ② ③ ④ ⑤
	Technological development	① ② ③ ④ ⑤
	Market pressure	① ② ③ ④ ⑤
	Cost pressure	① ② ③ ④ ⑤
	Corporate vision	① ② ③ ④ ⑤
	Process improvement	① ② ③ ④ ⑤
Digital Strategy	Which special challenges of strategic decision making do you identify in regard of digital transformation for your company	
	Which measures and activities do you execute to realize digital transformation	
Responsibilities	Who is in charge of realizing digital transformation in your company? (person mainly responsible, C-Level..., department, ...)	

Organizational structure	Which of the suggested organizational structures is the most adequate for digital transformation Why?	
	Please rate	I don't agree I fully agree
	Decentralized digitization department	① ② ③ ④ ⑤
	Centralized digitization department	① ② ③ ④ ⑤
Strategy & Knowhow	How well are the proposed strategy types applicable to implement digital transformation Why?	
	Please rate	I don't agree I fully agree
	Take over	① ② ③ ④ ⑤
	Strategic partnership	① ② ③ ④ ⑤
	Step by step internal development	① ② ③ ④ ⑤
	Spin-off	① ② ③ ④ ⑤
	Trial-and-Error	① ② ③ ④ ⑤
	Customer - Supplier Relationship	① ② ③ ④ ⑤
Digital change-management	Requires digital transformation new approaches in terms of change management If yes, which ones?	
End	Do you want to add something in regard of digital transformation?	

	Fragen	
Warm-Up-Frage	Wie würden Sie „Digitale Transformation“ aus Ihrer Expertise definierten?	
Transform or Die!	Digitally Transform or Die? Wie erfolgskritisch betrachten Sie DT für die Zukunft? Ohne DT = kein zukünftiger Erfolg? Woher kommt der Druck sich mit der „Digitalen Transformation“ zu beschäftigen?	
	Bitte bewerten Sie	Stimme nicht zu Stimme zu
	Kundenerwartung	① ② ③ ④ ⑤
	Supply Chain	① ② ③ ④ ⑤
	Technologische Entwicklung	① ② ③ ④ ⑤
	Marktdruck	① ② ③ ④ ⑤
	Kostendruck	① ② ③ ④ ⑤
	Unternehmensvision	① ② ③ ④ ⑤
	Prozessverbesserung	① ② ③ ④ ⑤
Digitale Strategie	Welche besonderen Herausforderungen der Strategie-entwicklung, im Kontext der „Digitalen Transformation“ kommen auf Ihr Unternehmen zu?	
	Welche Maßnahmen und Aktivitäten setzen Sie, um DT aktiv umzusetzen	
Verantwortlichkeiten	Wie sind die Verantwortlichkeiten in Ihrem Unternehmen zur DT verteilt. (Hauptverantwortlicher, C-Level..., Abteilungen, ...)	
Organisations-Struktur	Welche Organisationsstruktur fördert in dieser Hinsicht die Digital Transformation am besten Warum?	

	Bitte bewerten Sie	Stimme nicht zu Stimme zu
	Dezentralisierte Digitalisierungsabteilung	① ② ③ ④ ⑤
	Zentralisierte Digitalisierungsabteilung	① ② ③ ④ ⑤
Strategie & Knowhow	Wie anwendbar sind die unten angeführten Strategietypen Ihrer Ansicht nach, um DT erfolgreich zu implementieren. Warum?	
	Bitte bewerten Sie	Stimme nicht zu Stimme zu
	Unternehmensübernahme	① ② ③ ④ ⑤
	Strategische Partnerschaft	① ② ③ ④ ⑤
	Schritt-für-Schritt interne Entwicklung	① ② ③ ④ ⑤
	Spin-off	① ② ③ ④ ⑤
	Trial-and-Error	① ② ③ ④ ⑤
	Kunde-Lieferanten Beziehung	① ② ③ ④ ⑤
Digitales Change-Management	Benötigt die digitale Transformation neue Ansätze im Change-Management? Wenn, ja welche?	
Ende	Gibt es zum Thema Digitale Transformation noch etwas hinzuzufügen?	