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Analysis and Definition of Success Factors for the Development of a Management Framework

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Abstract

The success of a digital transformation is not a foregone conclusion. A digital transformation, as a highly complex process impacting major areas of an organization, requires a systematic approach that goes beyond individual transformation initiatives. This work analyses and integrates existing approaches to managing and coordinating a digital transformation in order to identify relevant success factors of a digital transformation, serving as a basis for the development of a systematic framework for a management model of digital transformation. The analysis reveals ten success-critical focus areas of a digital transformation, which comprise numerous success factors: 'Vision, goals, and strategies', 'Leadership', 'Communication', 'Digital culture and mindset', 'Digital platform', 'Partnership network', 'Capabilities, talents, and skills', 'Organization, coordination, and roles', 'Management methodologies', and 'Governance'. A systematic framework is proposed that serves as a basis for the future development of a management model, addressed to executives and experts who are tasked with launching, driving, and sustaining a digital transformation. It structures the management's tasks and responsibilities, arising in the context of a digital transformation, and follows a holistic perspective, considering relevant steering elements and their interdependencies.

Keywords: Digital transformation, success factors, management models, framework for a man-agement model of digital transformation

Contents

Abbreviations

AI	Artificial intelligence
CDO	Chief Digital Officer
CEO	Chief Executive Officer
CIO	Chief Information Officer
IP	Intellectual property
IPA	Intelligent process automation
RPA	Robotic process automation
SMAC	Social, mobile, analytics, and cloud computing technologies
TMO	Transformation management office

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Introduction

1

1.1 Relevance and Goal of this Work

Digital transformation is an omnipresent topic. Ever-increasing customer demands, ever-growing competition, and the emergence of new digital technologies, such as social networks, big data, cloud computing, advanced analytics, and intelligent process automation are increasing the pressure on companies to stay competitive in a revamped digital economy.[1] This is currently reinforced by the unique challenges posed by the impact of the COVID-19 pandemic on global supply chains and markets, and especially on working conditions. The pandemic is impacting all industries worldwide in a variety of ways, pushing companies to undergo a digital transformation and accelerate existing measures.[2]

In virtually all industries, companies are undertaking numerous initiatives to explore and exploit new technologies, impacting business processes and products, services, business models, and organizational structures.[3] But digital transformation is not about the technology itself, rather it is "about how technology changes the conditions under which business is done, in ways that change the expectations of customers, partners, and employees."[4]

But the success of a digital transformation is not a foregone conclusion. As studies have shown, the failure of a digital transformation is by no means uncommon. Recent surveys revealed that, while directors, CEOs, and senior executives

[1] Cf. Romero et al. (2019, p. 1); Bollard et al. (2017, p. 3).

[2] Cf. Hess and Barthel (2020); Brings and Weber (2020).

[3] Cf. Reis et al. (2018, p. 411); Matt, Hess, and Benlian (2015, p. 339); Hess (2019, pp. 1–2).

[4] Kane (2017).

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consider digital transformation as their number one concern[5], 70% of digital transformation initiatives do not reach their goals.[6]

Another survey by the Boston Consulting Group yields similarly devasting results: 26% of the organizations only reach less than 50% of the set targets and can therefore not achieve a sustainable change. 44% achieve to create value, but still the targets are not met, and therefore only limited long-term change can be sustained. And only 30% of surveyed organizations achieve a successful digital transformation and sustain change.[7]

Undergoing a digital transformation requires fundamental changes, representing a major challenge, especially in large, complex organizations. While technology plays an important role during digital transformations, the human dimension, such as the organization, operating model, processes, and culture, is usually the more decisive factor.[8] Experts estimate that a majority of these change efforts fail because of people's negative reactions and resistance to changes in their work, organizational business processes, and the technology they use.[9]

Thus, as a prerequisite for a successful digital transformation, a guidance on how to structure the management of a digital transformation is required.[10] From a systems-oriented perspective, any management activity must be embedded in diverse contexts and must always be considered interdependently with other activities, elements of the system, and its environment and thus, not as isolated.[11] A digital transformation, as a highly complex process impacting major areas of an organization, requires a systems-oriented and systematic approach that goes beyond individual transformation initiatives and shows how a digital transformation can be specifically managed and facilitated throughout a company.

Much of the existing literature focuses on specific areas and case-based facets of digital transformation.[12] The actual management and coordination of a digital transformation have been widely neglected in many approaches.[13] Although, various approaches have been developed that pursue a holistic perspective on

[5] Cf. Sun (2018).

[6] Cf. Bucy et al. (2016).

[7] Cf. Forth et al. (2020).

[8] Cf. Forth et al. (2020, p.1).

[9] Cf. Markus (2004, p. 2).

[10] Cf. Gimpel et al. (2018, p. 47).

[11] Cf. Rüegg-Stürm and Grand (2019, p. 40).

[12] Cf. Gimpel et al. (2018, p. 33).

[13] Cf. Hess (2019, pp. 3–4).

the management of a digital transformation, the management of a digital transformation remains ambiguous and often incomprehensible for practitioners and organizations.[14] Therefore, this work is dedicated to integrate existing approaches to provide a holistic and yet concrete framework for management models of digital transformation. It is explicitly not about the potential of individual digital technologies, the development of digital products and services, or the implementation of digital transformation in specific areas and of specific objects of a company. Rather this work aims to provide a blueprint for a management model of digital transformation, offering executives and experts, who are tasked with launching, driving, and sustaining a digital transformation, a guidance that allows them to approach the management of a digital transformation systematically and successfully.

This leads to the following research question, which is the guiding principle of this work:

– How can a framework for management models, resulting from the analysis of success factors, be structured to provide companies with guidance for a successful digital transformation?

1.2 Structure of this work

To answer the presented research question, this work is divided into 9 chapters, presented in Figure 1.1.

The chapters 2 and 3 outline the theoretical foundations as the knowledge base for this work. Chapter 2 deals with the fundamentals of digital transformation. After defining and differentiating the term 'digital transformations', its triggers and impacts are explained. Chapter 3 deals with the fundamentals of management models. To provide an understanding of the management function, the organization and its environment are first discussed from a system-oriented perspective. Then the characteristics of a management model are outlined in order to derive the need for a management model of digital transformation.

Chapter 4 presents the underlying systematic approach for defining success factors of a digital transformation. It discusses the analysis of selected literature and the conduction of semi-structured interviews, providing the basis for the definition of success factors. As part of the literature analysis, numerous success

[14] Cf. Gimpel et al. (2018, p. 33).

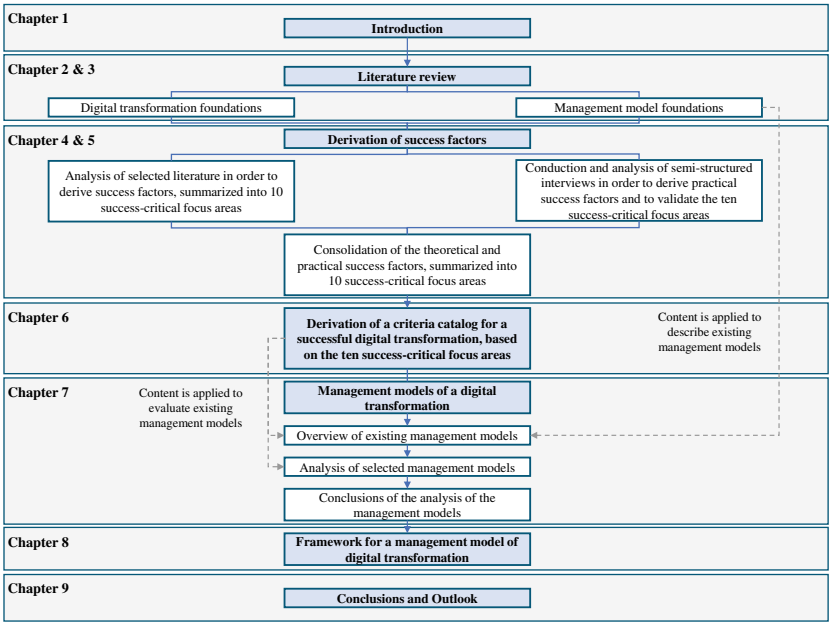

Figure 1.1 Structure of this work. (Source: Own illustration.)

factors are derived that are clustered into ten success-critical focus areas of a digital transformation—'Leadership', 'Vision, goals, strategies', 'Communication', 'Digital culture and mindset', 'Capabilities, talents, skills', 'Methodologies', 'Digital platform', 'Governance', 'Organization, coordination, and roles', and 'Partnership network'. These are validated and expanded as part of the interviews conducted.

Chapter 5 explains the ten success-critical focus areas of a digital transformation in detail. To this end, the underlying concept is first presented for each focus area, and then the corresponding success factors from literature and practice are compiled.

Based on the success-critical focus areas described in chapter 5, chapter 6 presents a criteria catalog for the successful management of a digital transformation.

Subsequently, chapter 7 examines existing approaches to managing a digital transformation. For this purpose, first an overview of existing approaches is provided. Two models are selected that meet the premises of a systems-oriented approach and are best suited to contribute to the implementation of the ten success-critical focus areas of a digital transformation. These two models are then analyzed and evaluated in detail, applying the criteria catalog, outlined in chapter 6. Finally, conclusions from the detailed analysis for a framework for management models of a digital transformation are presented.

In chapter 8, a framework is introduced based on the findings of the previous chapters, aiming to serve as a basis for the development of a detailed management model of digital transformation.

Finally, in chapter 9, this work outlines conclusions and draws an outlook for the future development of a detailed management model of digital transformation.

Digital Transformation Foundations

2

Digital transformation has attracted significant research interest from both academia and practice. There are numerous concepts and facets of digital transformation, some of which are controversial.[1] Thus, the following chapter explains the underlying conceptual understanding of digital transformation within this work. First, the history of digitalization and the emergence of digital transformation are presented. Then, after defining and differentiating the term 'digital transformation', its triggers and impacts are explained.

2.1 History of Digitalization and Emergence of Digital Transformation

Over the past 30 years, there have been several technological phases in which emerging digital technologies have evolved and have changed almost all areas of our work and life. This enormous impact can be evidenced by the figures on the development of computer and information technology: Whereas in 1990 just under 2% of German internet users aged 14 and over had access to the internet, today we are talking about over 90% of all German inhabitants.[2] Worldwide, almost half of all private households already own a computer.[3] Computers and smart devices determine essential parts of our lives: We use faster, more powerful, and cheaper computers in our work and personal lives. New business models

[1] Cf. Pucihar et al. (2017, pp. 427–428).

[2] Cf. Reinhardt (2020, pp. 14–15).

[3] Cf. Reinhardt (2020, pp. 14–15).

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are being developed, fields of operations are being simplified and fundamentally changed, processes are being streamlined, and formerly large paper and file inventories are being eliminated.[4]

In literature, the holistic digitalization and the widespread use of digital technologies are understood as the fourth industrial revolution, beginning in the 2000 s.[5] It describes the change in social and economic structures induced by technological innovation.[6] Based on the already widespread digital technologies of the third industrial revolution like electronics, telecommunications, and computers, the fourth revolution is mainly characterized by the convergence of digital, biological, and physical innovations.[7] Today, especially emerging social, mobile, analytics, and cloud computing technologies, so-called SMAC technologies, combined with ever-increasing processing power, storage capacity, and communication bandwidth are shaping the fourth industrial revolution.[8] As with previous industrial revolutions, this technological wave is expected to transform institutions, industries, and individuals.[9] Users, consumers, and citizens have rising expectations for sophisticated digital services and products, putting pressure on executives in commercial and public organizations and creating significant opportunities for disruptive startups. In the face of this digital revolution, digitalization is considered as an increasingly important strategic priority, requiring organizations to undergo a massive sociotechnical transformation that affects organizational structures, strategies, IT architectures, methods, and business models. Therefore, large-scale initiatives are set up to foster the digital transformation of science, industry, and society.[10]

2.2 Definition and Differentiation to Digitization and Digitalization

After providing an overview of the development of digitalization and the emergence of digital transformation in the previous chapter, this chapter defines and

[4] Cf. Reinhardt (2020, pp. 14–15).

[5] Cf. Castells (2009).

[6] Cf. Reinhardt (2020, 17-21); Legner et al. (2017, pp. 301–302).

[7] Cf. Schwab (2018).

[8] Cf. Reinhardt (2020, 17-21); Legner et al. (2017, pp. 301–302).

[9] Cf. Reinhardt (2020, p. 21).

[10] Cf. Legner et al. (2017, pp. 302–303).

distinguishes the terms of transformation, digital transformation, digitization, and digitalization.

In general, a transformation refers to any complex or fundamental change, impacting the appearance or character of something or someone.[11] Looking more specifically at an organizational level, a transformation refers to "a process of changing micro-economic organizational structures, turning (disruptive) environmental conditions into (constructive) opportunities while minimizing risks."[12] The organizational structures can have an internal or an external perspective. The internal perspective focuses on the adoption of internal capabilities and knowledge structures in order to master new environmental challenges, requiring changes in the corporate strategy, in organizational procedures, and in internal processes. The external perspective focuses on the activities of a company within its market environment.[13] Another definition is provided by Uhl and Gollenia, who refer to business transformation management in general as "the holistic management of extensive, complex changes on which the organization's future success strongly depends".[14] The two approaches are united by the definition of Klasen: "Business transformation is the strategic realignment and organizational transformation of a company or one of its parts to ensure sustainable performance in the market."[15]

Based on the clarification of the general term of transformation, the definition and the specific aspects of a digital transformation are highlighted. In literature, there exists no overarching definition yet. Hence, the following of this chapter intends to provide a definition of digital transformation, incorporating elements of existing definitions.

Uhl and Gollenia understand digital transformation as a "specialized type of business transformation on the pursuit of innovative digital or hybrid business and/or operating models, where the adoption and integration of information, communication and operational technologies play a dominant role in the corporate strategy to create new competitive advantages, namely: digital capabilities, based on digitally-enabled internal and/or external operations (i.e. business processes) in order to create value for customers, employees and other stakeholders."[16] In this

[11] Cf. Cambridge University Press (2014b).

[12] Reinhardt (2020, p. 39).

[13] Cf. Reinhardt (2020, p. 40).

[14] Uhl and Gollenia (2016, p. 4).

[15] Klasen (2019, p. 2).

[16] Uhl and Gollenia (2016).

definition, it becomes clear that a digital transformation is not just about implementing and using emerging technologies and about what companies choose to do with them. It is rather about how technologies can be used strategically to develop new digital or hybrid business and operating models that create competitive advantages in the form of digital capabilities, new values for customers, employees, and other stakeholders. Referring to this, Biesel and Hame address "a fundamental misunderstanding when [enterprises] see digital transformation [only] as the introduction of new IT technologies."[17]

Kane also follows this understanding, emphasizing that digital transformation is "about how technology changes the conditions under which business is done, in ways that change the expectations of customers, partners, and employees."[18] He further adds another aspect of digital transformation, its continuity. Digital transformation is not a process that will ever be completed, and its need will not abate. For Kane a digital transformation is a "continual adaptation to a constantly changing environment"[19]. It requires the capability of organizations, leaders, and employees to adapt to constant and rapid change, including anticipating the environment as well as continuously recognizing and effectively responding to trends.[20]

Reinhardt embraces the idea of adaptability in a company's changing environment and focuses on a company's organizational structures. He describes digital transformation "as a conscious and proactive building of complex structures of an organization, with the goal of being able to anticipate sudden and unexpected changes in the environment through a high degree of internal complexity and to quickly convert resulting decisions into new strategic options."[21]

The prior definitions can be summarized as follows, integrating the general concept of a business transformation:

> Digital transformation is a special kind of business transformation, driven by digital technologies and digital capabilities, enabling companies to effectively compete in an ever-changing digital world through rethought business models, refocused organizational structures, and values as well as optimized processes and methodologies.

[17] Biesel and Hame (2018, p. 2).

[18] Kane (2017).

[19] Kane (2017).

[20] Cf. Kane (2017).

[21] Reinhardt (2020, p. 69).

After clarifying the definition of digital transformation, it is important to differentiate the term digital transformation from the terms digitization and digitalization. Even though they are often used synonymously, they present different concepts.

Digitization is the basis of digitalization and digital transformation.[22] It is understood as the pure conversion of analog data into digital data, like images, texts, or even sounds. By digitizing analog data, it can be duplicated more cost-effectively, distributed worldwide, evaluated by machines, and even processed further by machines.[23]

While digitization refers to a technical process, digitalization refers to sociotechnical impacts and processes of the adoption and usage of digital technologies in broader contexts.[24] Digitalization reflects the increasing penetration of digital technologies in individual, organizational, and social context, causing fundamental changes in the connection of individuals and their behaviors as well as in the organization of companies and their processes.[25]

Digital transformation, in contrast to digitalization, does not pursue the mere goal of introducing digital technologies into enterprises. Rather, it has a more strategic perspective, that pursues change and specific goals, such as increasing productivity, improving customer experience, or rethinking the business model.[26] It is the managed adaption of companies, progressing digitalization.[27] Thus, digitalization is a necessary, but not a sufficient condition for digital transformation.[28]

2.3 Triggers of Digital Transformation

Companies do not undergo a digital transformation coincidentally. There are triggers that actuate companies to undergo a digital transformation and to generate sustainable benefits from it.

As early as the 1970 s, Ansoff pointed out in his explanations of strategic corporate management, that companies are confronted with so-called strategic

[22] Cf. Unruh and Kiron (2017).

[23] Cf. Harwardt (2019, p. 2); Kröhling (2017, p. 24).

[24] Cf. Legner et al. (2017, p. 301).

[25] Cf. Harwardt (2019, p. 3); Unruh and Kiron (2017); Schallmo and Williams (2018, p. 6); Gimpel and Röglinger (2015, p. 5).

[26] Cf. Harwardt (2020, p. 19).

[27] Cf. Gimpel and Röglinger (2015, p. 5).

[28] Cf. Locher (2020, p. 185).

discontinuities, requiring rapid reactions and flexibility from a company. These are deviations from the long-term planning, representing either a risk or an opportunity. Examples for discontinuities are e.g., existential threats by digital competitors, a sudden change in customer demands, or the emergence of new key technologies.[29] And exactly those discontinuities, leading to an increased environmental complexity and increased dynamics of the competitive environment,[30] trigger companies to undergo a digital transformation. Specific triggers of a digital transformation are presented in the following.

In the publication 'Transformation to Succeed: An Empirical Analysis of Digital Transformation in Firms', Stief et al. asked companies about the triggers for their digital transformation. They present six main reasons—competition, customers, initiative of one's own / intrinsic motivation, innovation / technical progress, strategic consideration—for undergoing a digital transformation.[31] These triggers are confirmed by the publication 'Digital Transformation: A roadmap for billion-dollar organizations' by Capgemini and the MIT Sloan Management in which three common pressures to begin a digital transformation are revealed. Companies felt medium or high pressure to transform primarily from the areas of customers, competitors, and employees.[32]

External triggers, such as competitors, customers, and emerging technologies, imply major changes for companies, entailing risks but at the same time promising opportunities for companies. Companies must embrace digital transformation in order to take advantage of these opportunities and not to be left behind.[33]

Competition is the strongest trigger for companies to undergo a digital transformation.[34] Companies are put under pressure by a fast-increasing pace of business: New digital technologies, increasing digitalization, and new market entrants with innovative business are causing existing industry boundaries to be redefined, blurred, and even dissolved.[35] Competition does not happen within single industries anymore. With the emergence of multi-sided business models, outside players enter and disrupt markets as strong competitors, leading to a changing balance of power in the competitive environment as well as rising

[29] Cf. Reinhardt (2020, p. 41–42); Arnold (1981).

[30] Cf. Reinhardt (2020, p. 42).

[31] Cf. Stief, Eidhoff, and Voeth (2016, p. 1837).

[32] Cf. Westerman et al. (2011, p. 9).

[33] Cf. Gimpel and Röglinger (2015, pp. 6–7).

[34] Nearly every executive (72 percent) cited competitive pressures forcing change. (Westerman et al. (2011, p. 9).

[35] Cf. Nadkarni and Prügl (2020); Stief et al. (2016, p. 1837); Westerman et al. (2011, p. 9).

cost and time pressure. Companies are forced to rethink their business activities and implement emerging technologies that can help to secure and continuously improve their market position.[36]

In addition, growing and changing customer demands trigger digital transformation.[37] Consumer behavior has changed, customers are becoming more demanding. Traditional marketing techniques and long-established seller-customer relationships may not apply anymore.[38] Companies are forced to transform their customer engagement strategies, to position themselves in a more customer-centric way, and to generate an end-to-end customer experience. For this purpose, the development of new products and services, a fast and always-available customer service, and an omni-channel presence through the purposeful connection between offline and online channels are to be considered.[39]

In addition to the factors already mentioned, innovations and emerging technologies play an important role in the decision-making process for digital transformation.[40] Technological developments are often a trigger for companies to undergo a digital transformation. While the evolution of innovation and technological change is not new, it is the speed of change that is increasing disproportionately as new digital capabilities are rolled out each year. The rapid growth of a variety of new digital technologies, such as internet of things (IoT), big data, cloud computing, and mobile technologies, has continued to drive the pace of change and magnify the impact of digitalization. Cloud and online platforms in particular have revolutionized the process and pace of turning an innovative idea into a business model. Companies need to understand how new digital technologies and innovations can change the business and how competitiveness can be ensured in the future. The need to develop a structured approach to digital transformation in order to exploit the potentials of digital technologies and thus realize and implement digital innovations is obvious.[41]

In addition to external factors, the company's own entrepreneurial initiatives and intrinsic motivation are identified as accelerators for digital transformation. Potential optimization through the integration of new digital technologies often lead to digital transformation initiatives and a broader, enterprise-wide approach.

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[36] Cf. Stief et al. (2016, p. 1837).

[37] Cf. Stief et al. (2016, p. 1837).

[38] Cf. Nadkarni and Prügl (2020); Westerman et al. (2011, p. 9).

[39] Cf. Stief et al. (2016, p. 1837); Forth et al. (2020, pp. 1–4).

[40] Cf. Stief et al. (2016, p. 1838).

[41] Cf. Nadkarni and Prügl (2020); Stief et al. (2016, p. 1838); Gimpel and Röglinger (2015, p. 6).

Complementary, companies are often driven by the idea of being a pioneer or fast adopter in some or all areas of their business. To achieve this, companies have the intrinsic motivation to optimize processes, to reduce costs, and to better utilize resources through digital transformation.[42] Intrinsic motivation can also be triggered by the employees themselves, who are accustomed to a higher level of digitalization. These personal practices are incorporated into the work environment, driving forward the digital transformation of the company.[43]

The last factor identified is strategic considerations on future developments that trigger companies to embrace digital transformation. As part of the strategy development process, companies realize how their way of working and their business model need to change in order to remain competitive in the future.[44] Although the main trigger for digital transformation is often existential challenges and strategic discontinuities, companies are starting to understand that digital transformation as a preemptive action from a position of strength is better than an imposed transformation from a position of distress.[45]

Complementing the above-mentioned triggers, companies are currently facing unique challenges from the impact of the COVID-19 pandemic on regulatory systems, global supply chains and markets and, most importantly, working conditions. It is impacting companies worldwide across all industries in a variety of ways and is triggering companies to undergo a digital transformation and to accelerate existing efforts. While the pandemic certainly curbed most companies and cut existing investment budgets in digital transformation, it has nonetheless become an unstoppable catalyst for digitalization and the associated digital transformation of companies.[46] According to a global survey of executives, conducted by McKinsey and Company, the pandemic has brought years of change in the way companies do business. Companies have accelerated the digitalization of their customer and supply-chain interactions as well as the share of digital or digitally enabled products in their portfolios. Not only the customer-facing elements of organizational operating models were accelerated but also the digitalization of the internal operations.[47] A survey of nearly 800 digital transformation strategy leaders in ten countries by KPMG adds to the impacts already mentioned that the pandemic is putting employees and their needs in the focus as companies

[42] Cf. Stief et al. (2016, p. 1838).

[43] Cf. Westerman et al. (2011, p. 9).

[44] Cf. Stief et al. (2016, p. 1838).

[45] Cf. Marckstadt et al. (2020, p. 9).

[46] Cf. Hess and Barthel (2020); Brings and Weber (2020).

[47] Cf. McKinsey & Company (2020, pp. 2–6).

realize that an exceptional customer experience can only be delivered by people. This requires the adaptation and digitization of existing ways of working. They revealed that 67% of respondents accelerated their digital transformation strategy and 63% increased their digital transformation budget as a result of COVID-19.[48]

2.4 Impacts of Digital Transformation

To successfully manage a digital transformation, companies need to ensure that their organization is familiar with its impacts. Impacts can be defined as the combination of exogenous (external) and endogenous (internal) forces that effect business organizations as a result of the transformation process.[49] Rump and Eilers differ between four levels that are affected by digitalization visualized in figure 2.1—the macro-, meso, micro-, and meta-level.[50] In the following, these layers are applied to describe the impacts of digital transformation.

At the micro level, describing job-related factors of individuals, digital transformation impacts the working environment, working models, the time and location of work as well as the work processes and requirements. Digital communication technologies as part of the digital transformation enable work to be performed independently of time and physical space. Flexible and remote working models are being developed, allowing employees a higher degree of flexibility and mobility. With this, physical contacts and direct interactions are inevitably reduced, impacting the relationship between colleagues and supervisors. Thus, the way of communication, the team cohesion as well as the trust building and the joint handling of challenges are influenced.[51] Nevertheless, according to a German study by the Initative D21 e.V., almost half of the working population is convinced that working flexibly in terms of time and space contributes to an increase in their quality of life, becoming an essential part of a modern working environment.[52] However, these working models are accompanied by the need of employees to learn how to coordinate these new flexibilities, taking into account the company's concerns and their own capabilities at the same time. A high degree of self-management and self-discipline is required.[53] To enable flexible

[48] Cf. KPMG International, (2021, p. 3).

[49] Cf. Reinhardt (2020, p. 43); Morakanyane, Grace, and O'Reilly (2017, p. 436).

[50] Cf. Rump and Eilers (2017b, p. 80).

[51] Cf. Rump and Eilers (2017a, pp. 5–6); Foerster-Metz et al. (2018, p. 9).

[52] Cf. Initiative D21 e. V (2020, p. 50); Initiative D21 e.V (2016, p. 46).

[53] Cf. Rump and Eilers (2017b, p. 81); Foerster-Metz et al. (2018, p. 9).

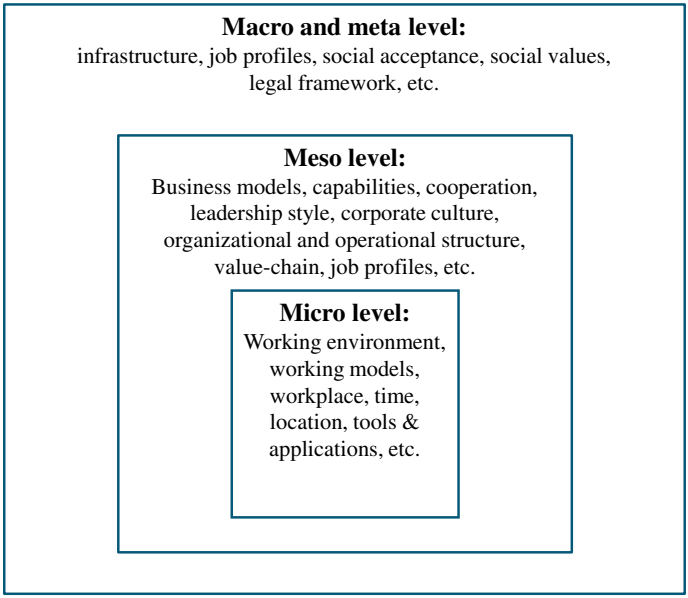

Figure 2.1 Levels of impacts of digital transformation. (Source: *Based on Rump and Eilers (2017, p. 81))*

working models, employers must ensure to provide the infrastructure of devices, access, and frameworks, required for flexible working models.[54]

In the context of digital transformation, the complexity and speed of work are steadily increasing due to constant change, accompanied by growing expectations of employees. Digital skills and the willingness to learn and change are becoming a matter of course, without which employees are not able to deal with the realities of the digital working environment.[55] In a survey conducted 2020 by the Initiative D21 e.V., almost 80 percent of employees are aware of these growing expectations and are convinced that professional success requires lifelong learning in the context of digitalization. However, only a small proportion of respondents are supported by their employer in developing the newly required competencies and in dealing with the changing environment caused by the digital

[54] Cf. Initiative D21 e. V (2020, p. 52).

[55] Cf. Friedrichsen and Wersig (2020, p. 201); Rump and Eilers (2017b, p. 81).

transformation.[56] Employees are therefore trying to meet these requirements by approaching new digital challenges primarily on their own initiative.[57]

Digital transformation does not only impact job-related factors of individuals, but also the operational factors of a corporation listed at the meso-level, like the business model, the corporation with stakeholders, the culture as well as the operational and organizational structure. Thus, digital influences affect many business areas, making it a challenge for all those involved and responsible—from leadership to employees.[58]

As digitalization disrupts established business rules and environments, current business models should be reassessed for their fit for the future digital economy. Companies should be aware of the low entry barriers in many parts of digital economy, making it easier for new competitors to shape and penetrate the market. Thus, the business model must withstand the increasing competitive pressure and the ever-increasing demands of its customers.[59] The impacts on the business models are accompanied by the impacts of the digital transformation on the required capabilities of a company. A company needs to develop the capacity to renew and recreate its strategic resources and capabilities in order to adapt to the needs of a changing environment.[60]

A literature study commissioned by the German Federal Ministry for Economic Affairs and Energy concluded that digitalization facilitates the outsourcing of business processes along value chains and refers to a blurring of traditional corporate boundaries.[61] New forms of cooperation and interchange within a company and a network of companies along the value chain are hence increasingly important in the context of the digital transformation. Accordingly, traditional customer and business relationships are being transformed and strategic alliances are becoming an essential instrument of corporate management.[62]

In addition, digital transformation has a profound impact on a company's existing organizational and operational structure, increasing productivity and efficiency and enabling a higher flexibility.[63] Evolving digital technologies and

[56] Cf. Initiative D21 e. V (2020, p. 55).

[57] Cf. Initiative D21 e.V (2016, p. 49).

[58] Cf. Rump and Eilers (2017b, p. 82); Foerster-Metz et al. (2018, p. 6); Reinhardt (2020, p. 53).

[59] Cf. Gimpel and Röglinger (2015, p. 5).

[60] Cf. Teece et al. (1997); Rump and Eilers (2017b, p. 82).

[61] Cf. Wischmann et al. (2015, p. 7).

[62] Cf. Rump and Eilers (2017b, p. 82), Rump and Eilers (2017a, p. 6).

[63] Cf. Foerster-Metz et al. (2018).

knowledge-based systems are providing new functionalities that result in opportunities, especially for optimizing intra- and inter-company workflows and for increasing the efficiency and effectiveness of business processes.[64]

As digital transformation has profound impacts on wide parts of the business, employees need to be open to new, challenging situations, requiring changes in behavior and actions. To improve and align the way people behave, companies need to transform their culture and their established mindset.[65] To enable the previously described flexible and remote working models, the culture must shift from a focus on presence towards a focus on results.[66] This cultural change is accompanied by a change in leadership, characterized by increasingly flat hierarchies. Therefore, leaders should be more motivators than controllers. Leaders should shape the framework conditions, coordinate, and motivate. A modern leadership culture relies on open and flexible structures, trust in the employees, and on personal responsibility of the employees.[67]

It is obvious that educational content and job profiles must be adapted when working environments, working models, business models, capabilities as well as work contents, organizational and operational structures change sustainably and in the long term. While new job profiles emerge, existing ones disappear or need to be adapted. Activities and tasks along the entire value chain are affected to varying degrees by the digital transformation.[68] On the meso level, companies need to analyze the specific impacts of digital transformation, reassess existing job profiles, adapt and develop new profiles as needed.[69] Teacher training, further education, learning plans, and teaching concepts must be fundamentally revised in order to meet the requirements of the digital age and to counteract the shortage of skilled workers. For this reason, the impact of the digital transformation on training is of particular interest in terms of labor market policy, the national economy, legal and political factors—the macro- and meta-level.[70]

Consequently, digitalization has an impact on both, the micropolitical design of organizations and the normative foundation of society, listed in the macro-

[64] Cf. Reinhardt (2020, p. 54); Foerster-Metz et al. (2018, pp. 5–6); Rump and Eilers (2017a, p. 6).

[65] Cf. Rump and Eilers (2017b, p. 82).

[66] Cf. Schaible et al. (2017, p. 6).

[67] Cf. Initiative D21 e.V (2016, p. 48); Rump and Eilers (2017a, p. 24).

[68] Cf. Rump and Eilers (2017b, p. 82).

[69] Cf. Rump and Eilers (2017a, p. 42).

[70] Cf. Rump and Eilers (2017b, pp. 80–82); Friedrichsen and Wersig (2020, p. 203).

and meta-level. Political actors are called on to create new regulatory and normative frameworks in order to leverage the potentials of digitalization and specific digital transformations for everyone. This includes the development of a robust digital infrastructure as a prerequisite for digital transformation, the dissemination of information regarding the consequences of digital transformation beyond technology and business models as well as the development of legal structures and regulations that are adapted to the changed forms and models of work.[71]

[71] Cf. Rump and Eilers (2017b, pp. 82–83); Reinhardt (2020, pp. 46-49).

Management Models Foundations

3

After describing the underlying conceptual understanding of digital transformation in chapter 2, the theoretical foundations of management models of digital transformation are presented in the following chapter. Together, the two chapters constitute the necessary knowledge base for this work. To provide an understanding of the management function, the organization and its environment are first discussed from a system-oriented perspective. Then the characteristics of a management model are outlined so that the final subsection can answer the question of why a management model of digital transformation is needed.

3.1 Organization and Environment from a System-oriented Perspective

According to the system-oriented perspective, an organization is a complex socio-technical system that creates specific value in relation to a specific environment.[1] Whereby, a "system is a whole formed by at least two interrelated elements, distinguishable from its environment, ordered by rules, and responsible for its purpose."[2]

Complex systems differ from non-complex systems in their high procedural complexity, as its elements can behave in numerous different ways and their relationships can vary significantly over time, both in terms of their existence and their quality. Consequently, the behavior of the individual elements can no longer be described exactly by an analytically determinable, fixed function. Thus, unlike

[1] Cf. Ulrich (1968); Ulrich and Probst (1991); Rüegg-Stürm and Grand (2019, p. 36); Erk and Spoun (2020, p. 35).

[2] Erk (2016, p. 80).

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complicated systems, the behavior of complex systems can neither be completely understood nor unambiguously predicted.[3] As complex systems, organizations exhibit a multitude of different connections between their elements as well as a high degree of behavioral variance and dynamics among them. Thus, the number of possible system states and system behaviors can only be analyzed and predicted probabilistically and therefore only be controlled and managed to a limited extent.[4]

Socio-technical systems are systems that are not only composed of people, but additionally of non-human elements. Like in organizations, human actions and interactions are carried out, supported by technical tools.[5]

Erk and Spoun describe six dimensions that constitute the basis of a system. These dimensions are applied to an organization and its environment in the following:

- *Wholeness:* A system is something composed, connected, or unified into a whole. Thus, it forms a wholeness or unity. In this way, an organization is a system that is composed of its elements to form a whole.[6]
- *Elements:* A system consists of at least two parts, which by their union form a wholeness. These parts are called elements. They are the smallest building blocks of an observed system. These elements can vary depending on the perspective and cognitive interest. From a materially technical perspective, for example, the buildings, sites, infrastructures, and technologies represent the elements of an organization. If you examine an organization from an economic perspective, for example, transfer prices, financial resources and their allocations represent its elements.[7]
- *Boundary and environment:* A system has got a boundary that separates it from the outside and delimits it as a whole. This boundary can be of physical or mental nature, which may vary depending on the observer's perspective. Everything inside the boundary belongs to the system, everything outside the boundary does not belong to it and is considered as part of the 'environment'. Based on the system-oriented perspective, an organization is a system embedded in a dynamic environment. Therefore, entrepreneurial activities should always be considered in a comprehensive context. The thorough identification

[3] Cf. Erk and Spoun (2020, pp. 30–31); Rüegg-Stürm and Grand (2019, p. 37).

[4] Cf. Erk and Spoun (2020, p. 38).

[5] Cf. Erk and Spoun (2020, p. 34).

[6] Cf. Erk and Spoun (2020, p. 14); Rüegg-Stürm and Grand (2019, p. 36).

[7] Cf. Erk and Spoun (2020, pp. 14–15); Rüegg-Stürm and Grand (2019, pp. 36–37).

and understanding of relevant contexts, which can relate both—to the internal world of an organization, such as the historical origins of an organization, teams, or specialist departments, and to the environment of an organization, such as the technology and market dynamics or the behavior of market participants, are essential.[8]

- *Interconnectedness:* The elements of a system have relationships to each other. They are interconnected, influence each other, and may exhibit repercussions. Systems have not only internal connections, but also external connections with their environment. To form a system, the internal interconnectedness between the elements of a system must be more perceptible and stronger than the interconnectedness of the elements with the environment. Based on the system-oriented perspective, the focus is not on the properties of individual elements of the organization, but on their interdependencies and interactions and the resulting effects and repercussions. In this context, Rüegg-Sturm and Grand argue that a "system as a dynamic whole (in a dynamic environment)"[9] is more and is also something different than the sum of its individual elements, causing its complexity.[10]
- *Order and organization:* The elements of a system are based on an order, structuring and organizing them in their wholeness. This order is based on and results from rules that determine the behavior and interactions of the elements. An organization is inherently organized by these structures, which are usually evolving and therefore dynamic.[11]
- *Purpose:* Every system has a purpose—the reason why it was developed. The purpose of a system determines which and how many elements are needed, when and where. In addition, it determines the extent and scope of the interconnectedness of the elements as well as their behavior over time. The order and organization of the system need to be aligned with its purpose. Similarly, an organization follows a purpose, in the form of a vision and goals and the generation of value. The elements of the organization should always be structured and aligned with the organization's purpose.[12]

[8] Cf. Erk and Spoun (2020, pp. 17–18); Rüegg-Stürm and Grand (2019, p. 38).

[9] Rüegg-Stürm and Grand (2019, p. 40).

[10] Cf. Rüegg-Stürm and Grand (2019, p. 40).

[11] Cf. Rüegg-Stürm and Grand (2019, p. 37); Erk and Spoun (2020, pp. 21–23).

[12] Cf. Erk and Spoun (2020, p. 23).

3.2 Management and Management Tasks

Management is understood to be the function of the system 'organization', ensuring the fulfillment of the system's purpose and goals by the people, constituting the system.[13] Thus, all measures taken by management must affect these people and ensure that their actions are aligned with and contribute to the realization of the company's purpose.[14] Accordingly, Eccles and Nohria define management as the "art of getting things done. And to get things done, managers must act themselves and mobilize collective action on the part of others."[15] Ulrich and Probst refer to management as the "management of purpose-driven social systems"[16]. They consider the question of how to successfully design, steer, and develop such a dynamic and complex system towards the fulfillment of purposes and the achievement of goals as the core question of the management.[17]

As described in Section 3.1, organizations are complex systems whose behavior can only be analyzed and predicted probabilistically, and which can therefore only be controlled to a limited extent. According to Erk and Spoun, this is a paradox of management: "Management must work in and with a system without being able to fully control the system. Management can thus be described as the art of mastering something that can only be mastered to a limited extent."[18]

According to Erk and Spoun, management incorporates five tasks, ensuring that an organization fulfills its purpose and goals,[19] shown in figure 3.1.

- *Purpose and goal setting:* Purpose and goal setting incorporate the definition of the purpose of a company and the determination what the system must do in order to achieve this purpose.[20]
- *Organizing:* Organizing is an indirect influence on behavior through the creation of an order, corresponding with the system's purpose and goals. A company as a socio-technical system is an artificial system whose order is not

[13] Cf. Erk and Spoun (2020, p. 77).

[14] Cf. Erk and Spoun (2020, p. 81).

[15] Eccles and Nohria (1992, p. 39).

[16] Ulrich and Probst (1991, p. 240).

[17] Cf. Ulrich and Probst (1991, p. 239).

[18] Erk and Spoun (2020, p. 38).

[19] Cf. Erk and Spoun (2020, pp. 81–87).
The management tasks were defined in German. Although the authors suggest English translations for some tasks, these are slightly modified for ease of understanding within this work. This is to better convey the actual meaning of the management tasks.

[20] Cf. Erk and Spoun (2020, p. 85).

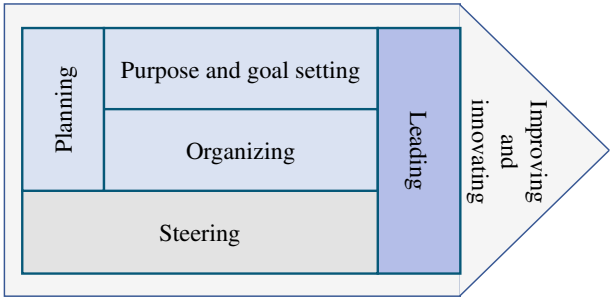

Figure 3.1 Management tasks. (Source: Based on Erk and Spoun (2020, p. 94))

predetermined but must be created and adaptively maintained. This process is called organizing.[21] Together with 'Purpose and goal setting', 'Organizing' constitutes the task of 'Planning'.

- *Leading:* Leadership is understood to be the intentional and direct influencing of the behavior of another individual or a group in order to pursue common goals.[22]
- *Steering:* Steering includes monitoring the system's behavior and taking proactive or reactive measures if the predicted or effective system behavior deviates from the planned behavior. It influences the behavior of the elements of a system only by means of the management tasks 'planning' and 'leading' and ensures that they are not only processed once, when the system is created, but in fact continuously.[23]
- *Improving and innovating:* Improving and innovating highlight that the management of a company does not only consist of reacting and counteracting to actual-target deviations; rather, it also includes effectively developing the company further, innovating and constantly improving it. Management must proactively reflect on existing management tasks in terms of their appropriateness and potential for improvement and adjust them as necessary.[24]

[21] Cf. Erk and Spoun (2020, p. 84).
[22] Cf. Erk and Spoun (2020, p. 83).
[23] Cf. Erk and Spoun (2020, pp. 85–86).
[24] Cf. Erk and Spoun (2020, p. 86).

The described tasks of management are by no means independent of each other and cannot be analytically assigned to different managers. Rather, they are interrelated, and each manager should address them iteratively and completely.[25] Referring to this, Brech describes the management process as "a unity, and its several parts or aspects must be recognized as related items in the one integral process"[26].

3.3 Definition Management Model

A model is a replication of a part of reality (an archetype). A system, as described in chapter 3.1, represents such a part of reality. Models are applied in situations where interrelations are complex and not obvious. They are intended to make reality more understandable and manageable by anticipating possible developments through targeted abstraction and simplification, fostering the strength of imagination. Thus, they create a solid understanding by becoming the subject of explicit common reflection and orientation.[27]

In his model theory[28], Herbert Stachowiak examined characteristics and properties of models. He identified three characteristics by which models can be described:

- *Mapping:* Models are always models of something. They are not identical with their original archetype. They can be the illustration or representation of a natural or artificial original, whereby the original can in turn be a model itself.[29]
- *Reduction:* Models never contain all, but only those features of the archetype that are relevant to the designer. The selection of features to be considered may be intuitive and arbitrary or based on the intentions and operational objectives of the model designer and user.[30]
- *Pragmatism:* Models are not per se unambiguously assigned to their originals. They fulfill their substitution function. Models are created for certain users, that can be humans or an artificial model, like a computer program. They

[25] Cf. Erk and Spoun (2020, p. 94).

[26] Brech (1953, p. 40).

[27] Cf. Fleischmann et al. (2018, pp. 21–23); Rüegg-Stürm and Grand (2019, p. 30).

[28] Cf. Stachowiak (1973).

[29] Cf. Stachowiak (1973, p. 131).

[30] Cf. Stachowiak (1973, p. 132).

> fulfill a function over a specific time interval, and they are created for a specific purpose. Be it to better understand a certain part of reality, or to get a blueprint for the (re)design of reality.[31]

When creating a model, a balance must be reached between a sufficiently accurate representation of the aspects of reality and a manageable level of complexity. These conflicting goals lead to an iterative development process of models. Most models are iteratively developed until they reach the end of their life cycle as they are no longer manageable.[32]

A management model represents an entrepreneurial reality, that increases the collective imagination of those who deal with management challenges. By consciously selecting and simplifying cause-and-effect relationships, the model enables management to identify impact dynamics and opportunities. Thus, management models serve as a means of understanding and reflecting in order to adequately comprehend and responsibly practice the management function and tasks in its complexity.[33]

3.4 The Need for a Management Model of Digital Transformation

In Section 3.1 and 3.2, it becomes evident that, from a systems-oriented perspective, there is a complex relationship between the environment, the organization, and its management. Any activities must therefore be embedded in diverse contexts and always be considered as interdependent with other activities and not as isolated. Thus, management effectiveness does not result from individual actions and individual decisions, but from interdependent interactions that are considered embedded in a specific situation and continuously developed.[34]

Chapter 2 illustrates that digital transformation is a highly complex process, impacting major areas of an organization. Thus, the process of digital transformation should not be carried out in a random, unstructured, and uncoordinated manner. Rather, a systematic approach, that goes beyond individual transformation initiatives and shows how a digital transformation can be specifically managed and facilitated throughout the company, is needed.

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[31] Cf. Stachowiak (1973, pp. 132–133).

[32] Cf. Fleischmann et al. (2018, pp. 19–20).

[33] Cf. Rüegg-Stürm and Grand (2019, pp. 30–31).

[34] Cf. Rüegg-Stürm and Grand (2019, p. 40).

In this context, Hess and Barthel propose two levels of digital transformation, illustrated in figure 3.2.

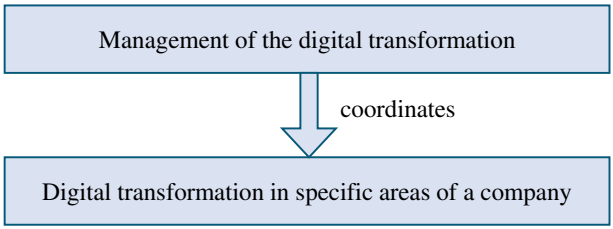

Figure 3.2 Two levels of digital transformation. (Source: Based on *Hess and Barthel (2017, p. 314)*)

The first (upper) level 'management of the digital transformation' represents the creation of structural prerequisites for digital transformation, ensuring that its opportunities and risks are identified, the right priorities are set, and the right projects are prioritized and implemented. In other words, the management level ensures that the conditions are created for an effective and efficient operational level of digital transformation.[35]

The second (lower) level 'digital transformation in specific areas of a company' represents the operational level of digital transformation—the specific changes in business processes, products, or business models to be implemented.[36]

The level of the 'management of the digital transformation' has been widely neglected in many companies. Companies are often content to have recognized the importance of digital transformation and to have addressed and driven it forward in various initiatives. But this is no longer sufficient. A management model is needed that serves as a basic framework and guidance for the successful management of the digital transformation, assisting in dealing with this constant complexity and market dynamics.[37] Thus, this work focuses on the level of the 'management of the digital transformation' and does not evaluate the digital transformation in specific areas and of specific objects of a company.

[35] Cf. Hess and Barthel (2017, pp. 314–315).

[36] Cf. Hess and Barthel (2017, pp. 314–315).

[37] Cf. Hess (2019, pp. 3–4).

Approach for the Derivation of Success Factors

4

Companies around the world consider digital transformation as their number one concern and have started their transformation journey. Nevertheless, most of these companies fail to achieve their set goals. Thus, companies are seeking for guidance on how to successfully exploit digital transformation. Success factors can provide this guidance. After the theoretical foundations of digital transformation and management models have been presented in the preceding chapters, the following chapter explains the underlying systematic approach for defining success factors of a digital transformation. The chapter commences by providing a basic understanding of the term success factor. Subsequently, it is illustrated how the literature was analyzed, how the interview questionnaire was developed, and how the interviews were conducted and evaluated in order to identify relevant success factors for managing a digital transformation. Thus, this chapter forms the basis for deriving and describing the success factors in chapter 5.

4.1 Success Factor Definition

Since the mid-1960 s, a research direction has developed, dealing with the identification of explicit factors, influencing entrepreneurial success. The so-called success factor research aims at identifying the strategic factors that successful companies have in common and that distinguish them from less successful com-

Supplementary Information The online version contains supplementary material available at (https://doi.org/10.1007/978-3-658-36158-7_4).

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https://doi.org/10.1007/978-3-658-36158-7_4

panies.[1] The definition of success factors refers to the idea that a company's success or failure can be traced back to a few central influencing factors with decisive impact.[2] Due to the ever-increasing complexity of decisions, pragmatic decision-making guidance is sought. Success factors can provide this guidance. Hence, the results of success factor research often attract a high level of attention.[3]

Direct and indirect research methods, illustrated in figure 4.1, can be used to identify success factors empirically.

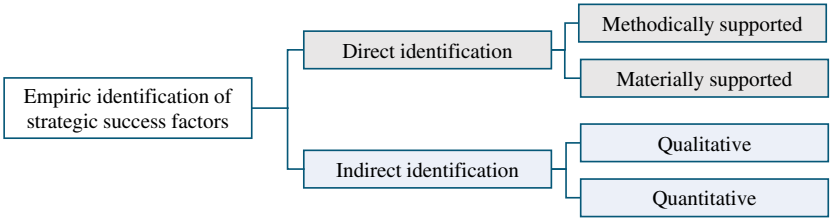

Figure 4.1 Empiric identification of strategic success factors. (Source: Based on Haenecke (2003, p. 15))

The direct research method involves asking directly about the variables that influence success, for example within expert interviews. Experts can be internal experts, such as company employees, or external experts, such as customers, suppliers, or scientists. Furthermore, it can be distinguished whether the direct success factor research is methodically supported or materially supported. In the methodically supported method, creativity techniques, such as brainwriting or brainstorming, or special survey techniques, such as the Delphi method or in-depth psychological interviews, are used. In the materially supported method, checklists or reference frameworks are used, which specify potential success factors that are systematically queried as part of an empirical survey. In addition, a structured questionnaire that is based on hypo-theses about success factors and used in expert interviews can be applied as material support.[4]

The indirect determination of success factors uses statistical methods or mental analysis to investigate, which factors effectively influence success. It aims

[1] Cf. Krechting (2000, p. 75).

[2] Cf. Trommsdorff (1992, pp. 182).

[3] Cf. Krechting (2000, pp. 75–76); Schmalen et al. (2006, pp. 1–2).

[4] Cf. Haenecke (2003, pp. 14–15).

to uncover an empirical relationship between potential success factors as independent variables and success measures as dependent variables. It does not ask directly for the causes of success. The indirect research method can further be categorized into qualitative and quantitative methods.[5]

Qualitative research methods include interviews or the use of case studies, evaluated in a subjective-verbal manner. Hereby, it is typical to identify and describe generalized basic virtues of entrepreneurial activity that distinguish successful companies from less successful ones.[6] In contrast, quantitative methods determine success factors, based on a standardized collection and analysis of quantitative and qualified company data. The contribution of situations, strategies, performance factors, or structures to a company's success are measured.[7]

One of the most well-known publications, using qualitative research methods, is the work of Peters and Waterman (1982).[8] Their work provided important impetus for the success factors research and gained wide popularity.[9] They identified eight attributes characterizing an excellent company, like bias for action, close to the customer, autonomy and entrepreneurship, and productivity through people.[10]

On the other side, one of the most well-known examples of quantitative success factors research is the 'Profit Impact of Market Strategy' (PIMS). A systematic investigation of the relationship between strategic corporate variables and the realization of corporate goals was conducted to identify the key factors that have an impact on a company's success. Specifically, the PIMS examines the correlations between the dependent variables, return on investment and cash flow, on the one hand and the independent influencing factors of the market, competitive position and strategy/tactics, on the other hand based on statistical data from over 450 companies.[11]

To identify success factors for managing a digital transformation, the direct materially supported research method was selected. The following chapter describes the approach and procedure in detail.

[5] Cf. Schmalen et al. (2006, p. 5); Haenecke (2003, p. 15).

[6] Cf. Kube (1991, p. 5); Krechting (2000, p. 76).

[7] Cf. Krechting (2000, p. 76).

[8] Cf. Krechting (2000, p. 76).

[9] Cf. Schmalen et al. (2006, p. 1).

[10] Cf. van Ven et al. (1983, pp. 13–16).

[11] Cf. Schmalen et al. (2006, p. 1); PIMS Assoicates Ltd.; Krechting (2000, p. 77).

4.2 Analysis of Selected Literature

As part of this work, a literature search was conducted to identify relevant academic research articles and publications, serving as a basis for defining success factors for managing a digital transformation. The claim is not to provide a complete and gapless literature review. Rather the focus was on identifying valid and holistic approaches and considerations for digital transformation. Additionally, the important aspects about the interrelations and dependencies of individual subareas of a digital transformation were investigated. A total of ten articles and business and management publications of renowned business schools, consultancies, and scientific literature were identified as a suitable basis. The list of the analyzed articles and publication can be found in Appendix A in the electronic supplementary material.[12]

The approach to the analysis of the selected literature is illustrated in figure 4.2 and is explained in detail in the following.

An in-depth analysis of the articles and publications was carried out to determine recommendations for undergoing a digital transformation and to identify aspects of digital transformation that are particularly critical to success.

In total 150 recommendations for a successful digital transformation could be extracted from the reviewed articles and publications. Based on the recommendations, almost 240 specific success factors were derived. Special attention was paid to a uniform formulation and to the comparability of the derived success factors, enabling the identification of patterns among the extracted recommendations for a successful digital transformation. An excerpt of the extracted recommendations and derived success factors can be found in Appendix B.1 in the electronic supplementary material[13].

As a result, 42 detailed and prioritized clusters could be built, comprising the previously derived success factors. In the next step, the clusters were grouped into the following ten overarching success-critical focus areas of a digital transformation. An excerpt of the derived success factor clusters and success-critical focus can be found in Appendix B.2 in the electronic supplementary material. The focus areas are listed in the following. The order of the nominations is not

[12] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_4).

[13] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_4).

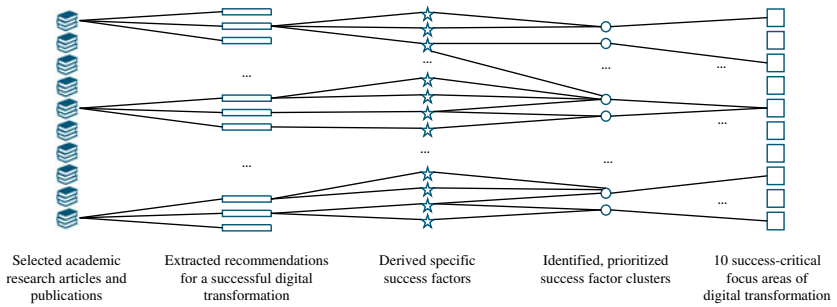

Figure 4.2 Approach to the analysis of the selected literature. (Source: Own illustration.)

intended to convey any conclusions about the importance for the success of a digital transformation:

- Vision, goals, and strategies
- Leadership
- Communication
- Digital culture and mindset
- Capabilities, talents, and skills
- Governance
- Organization, coordination, and roles
- Management methodologies
- Digital platform
- Partnership network

The meaning and specific contents of the success factor clusters and the success-critical focus areas are described in detail in chapter 5.

4.3 Conduction of Semi-structured Interviews

In order to identify practical success factors for managing a digital transformation, interviews were conducted to retrieve experiences and lessons learned. The analysis of the interviews served as a basis for the comparison and verification of the success-critical focus areas and success factor clusters, identified in the selected literature.

Eight one-to-one interviews were conducted, following a semi-structured methodology. The semi-structured interview approach is often referred to as qualitative research interview and aims to explore facts, opinions, and attitudes in order to question and understand not only the 'what' and the 'how', but also the 'why'. Thereby, important background and contextual information can be gathered. Depending on the progress of the interview, the order and use of the key questions may vary between the interviews. Unplanned questions may also be interposed to obtain more in-depth details.[14]

The process of the analysis of the conducted interviews is illustrated in figure 4.3 and explained in detail in the following.

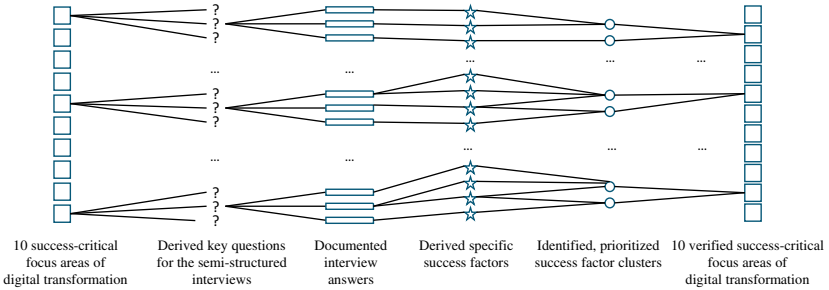

Figure 4.3 Approach to analysis of conducted interview. (Source: Own illustration.)

The key questions are divided into eleven sections and can be found in Appendix C in the electronic supplementary material[15]. The first section of the questionnaire contains general questions, surveying information about the digital transformations accompanied and about the companies, undergoing the digital transformations. The other ten sections are based on the ten success-critical focus areas, identified in chapter 4.2. For each focus area questions about factors, driving the success of a digital transformation, and factors, potentially hindering its success, are asked. The questionnaire is concluded by asking about a possible prioritization of the ten success-critical focus areas. The key questions include a

[14] Cf. Saunders et al. (2016, pp. 390–392).

[15] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_4).

mixture of open, probing, and closed questions, to promote validity and credibility of the interviews.[16] Double-barreled questions, raising several separate issues but providing only one set of possible answers, and leading questions, that may cause forms of bias, were avoided. Moreover, credibility was promoted, and the risk of unconscious response bias was reduced by sending the key questions to the participants before the interview, informing them about the information of interest and providing them with the opportunity to prepare for the interview.[17]

The interviews were conducted and recorded via video chat. To evaluate the interviews, the answers to the individual key questions were documented, based on an edited transcription. This documentation method focuses on delivering the core messages of the given answers, rather than transcribing the interview word by word.[18] The documented experiences were then analyzed and consolidated in order to identify patterns in the given answers. In the next step, specific success factors according to the individual key questions were derived based on the described experiences and identified patterns. Here, particular focus was put on a uniform formulation and on the comparability. As a result, 55 detailed and prioritized clusters could be built, comprising the previously derived success factors. An excerpt of the findings of the conducted interviews can be found in Appendix E.1 in the electronic supplementary material[19].

The interviewees, having coordinating roles within a digital transformation, were selected from the 'SAP BTS CFO Advisory team'. The team leader, two strategic advisors, two program and project managers, as well as one solution architect for accounting and finance, and two business and process consultants were interviewed. This approach ensures a broad and integrated perspective on accompanying and managing digital transformations.

The eight interviewees drew on experiences in a total of 29 companies in which they have accompanied a digital transformation. These companies, headquartered in Germany, operate in a wide range of industries, like higher education and research, automotive, or healthcare, and have between 649 and 340.000 employees, most of them worldwide.[20] The exact distribution of companies by industry, number of employees, and annual turnover is shown in figure 4.4.

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[16] Cf. Saunders et al. (2016, p. 408).

[17] Cf. Saunders et al. (2016, p. 401).

[18] Cf. Bhagat (2002, pp. 38–39).

[19] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_4).

[20] Based on the EU-wide classification system in which companies are categorized as small, medium-sized, or large by the German Trade & Invest, all companies are classified as 'Large

Criteria	Absolute frequency	Relative frequency
Industry		
Automotive	2	7%
Chemicals	1	3%
Consumer products	2	7%
Energy	5	17%
Healthcare	3	10%
High tech	2	7%
Higher education and research	1	3%
Manufacturing	3	10%
Professional services	3	10%
Public sector	3	10%
Telecommunication	2	7%
Travel and transport	3	10%
Number of employees 2019 (if available)		
< 1.000	3	10%
1.000 ≤ 3.000	5	17%
3.001 ≤ 15.000	7	24%
15.001 ≤ 100.000	10	34%
> 100.000	5	17%
Annual turnover 2019 (if available)		
> 100 Mio. EUR ≤ 500 Mio. EUR	4	14%
500 Mio. EUR ≤ 1 Mrd. EUR	2	7%
1 Mrd. EUR ≤ 25 Mrd. EUR	15	52%
25 Mrd. EUR ≤ 100 Mrd. EUR	3	10%
> 100 Mrd. EUR	2	7%
Not specified	3	10%

Figure 4.4 Structure of the companies in which a digital transformation was accompanied. (Source: Own illustration.)

The majority of the companies accompanied were pursuing a range of internal and external goals, providing information about the strategic orientation and the scope of digital transformation.

The pursued internal goals include increasing flexibility, exploiting new digital possibilities, enabling future business success, achieving a pioneering role and/or benchmarking position, increasing revenue and value, reducing costs, and increasing efficiency, optimizing systems, digitization level, and transparency, optimizing processes, automation, and standardization, as well as optimizing work environment. The pursued external goals include optimizing customer proposition, optimizing corporate image, generating social impact, optimizing and developing (new) business models, and securing and strengthening market position.

By means of the interviews, practical perspectives from a diverse set of companies are represented, allowing the assumption that the results are generally

Enterprises', except of the three companies whose annual turnover was not specified. (Germany Trade & Invest (2021)).

applicable to companies headquartered in Germany. In addition, no concrete differences were identified between the various industries and company sizes with regard to the success factors to be derived. This further supports the assumption of generalizability.

4.4 Derivation of Success Factors

As described in the preceding subchapters, the analysis of the selected literature led to the derivation of success factors that were grouped into overarching success factor clusters and success-critical focus areas of a digital transformation. These were verified and, if necessary, expanded through the interviews conducted, in which success factors were derived based on practical experience and lessons learned of the interviewees of the 'SAP BTS CFO Advisory' team.

Following the approach of Lauer's success factor model, comprising nine factors that must be considered in change management processes, a model is presented that contains success factors for managing a digital transformation. In his model, Lauer first describes the underlying concept for each success factor and then the influence on the success of change management. Subsequently, he explains in detail how the respective factor should be designed successfully.[21]

This approach is adopted in chapter 5 to present the results of the analysis of the selected literature and the conducted semi-structured interviews. For each focus area, the underlying concept and contribution to the success of a digital transformation are presented. Following this, the identified success factor clusters and the success factors are explained in detail, by discussing the results of the literature analysis and the semi-structured interviews within an individual subchapter.

In chapter 5, each focus area is considered individually. However, they are by no means clearly separable from one another; there are overlaps, underscoring the complexity of a digital transformation. A digital transformation can only be successful by managing the interdependencies and interactions of all focus areas. These interrelations were also confirmed by the interviews conducted. The interviewees agreed that considering the interplay of the focus areas is more important than a concrete ranking of the individual areas according to their importance for the success of a digital transformation. In order to be able to develop a holistic view of the individual areas, an understanding of the importance and meaning of each individual area must be established first.

[21] Cf. Lauer (2021).

Derivation of Success Factors

5

The following chapter presents the ten identified success-critical focus areas of a digital transformation in detail. First, for each focus area, the underlying concept and the respective contribution to the success of digital transformation are presented. Subsequently, the corresponding success factors from literature and practice are compiled. For an overview, the comparison of the citations from literature and interviews can be found in Appendix E in the electronic supplementary material[1].

5.1 Focus Area: Vision, Goals, and Strategies

5.1.1 Concept and Contribution to Success

A vision leads the way in a digital transformation, it inspires those affected and it provides a basic guidance, by drawing a realistic but challenging picture of a company's future.[2] It represents the target state of the digital transformation. The path to achieve the vision does not necessarily have to be clarified and individual steps not yet concrete. Therefore, goals are derived as achievable intermediate

[1] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_5).

[2] Cf. Lauer (2021, p. 107).

Supplementary Information The online version contains supplementary material available at (https://doi.org/10.1007/978-3-658-36158-7_5).

K. Wenzel, *Management Models of Digital Transformation*, BestMasters,
https://doi.org/10.1007/978-3-658-36158-7_5

steps on the path to the vision. Goals are the steppingstones, leading to the vision, while the strategies are the developed plans to achieve the defined goals.

The vision, goals, and strategies provide a clear direction for the transformation and create orientation. The higher educated workforce shifts away from solely carrying out instructions to really feeling the need to understand the reasons and background of tasks. Individual responsibility increases, employees become the managers of their own fields of duty. Herby, a vision, goals, and strategies support employees in understanding the 'bigger picture' of one's own tasks.[3]

The vision, goals, and strategies are not only important for creating orientation but are also decisive for the development of motivation. They help those affected by and involved in the digital transformation to understand that worthwhile goals are being pursued. Knowing this, enables them to commit to the digital transformation and to its causes. It fosters not only the extrinsic motivation to receive a reward, but also the intrinsic motivation and the willingness to be open to the upcoming changes.[4]

5.1.2 Success Factors

In total nine clusters were derived from the analyzed literature and the conducted interviews for the success-critical focus area of vision, goals, and strategies. In the following, each identified success factor cluster is described in detail.

Definition of a transformative vision

In six publications analyzed[5] and four interviews, defining a vision that explains the reasons for digital transformation and creates a sense of urgency was identified as critical to success. The vision should explain what 'digital' means to the company and what benefits, changes, and risks could result from it. A vision should be rather transformative than incremental. It should not only focus on the implementation of new technologies but also consider new ways of operating.[6] It should draw a compelling and optimistic picture of the transformed company of the future. The formulation of the vision and goals ought to start with discussions about opportunities and new ways, opened up by emerging digital technologies,

[3] Cf. Lauer (2021, pp. 109–110).

[4] Cf. Lauer (2021, p. 110).

[5] Cf. Martin (2018, p. 12); Burkacky et al. (2018, pp. 8–9); Marckstadt et al. (2020, p. 20); Reinhardt (2020, pp. 79–86); Westerman et al. (2011, pp. 48–50); Kane et al. (2015, p. 11).

[6] Cf. Westerman et al. (2011, p. 108).

improving customer satisfaction and performance. Thus, it is important that a company stays informed about emerging digital practices, tools, methods, and technologies. One interviewee specifically recommended to start the process of defining a vision and goals with thinking outside the box and following the motto 'if the sky is the limit'. Although the term 'transformation narrative' was not mentioned by all interviewees or authors, a narrative helps underpinning the definition of a transformative vision and goals, by explaining the transformation's background in a way that is understandable to individuals in the organization so that they can understand and interpret implications for their roles and work environment. A narrative is understood as a method in which a specific, intended cause-effect context is communicated with the help of storytelling. The goal of a narrative in the context of digital transformation is that the organization identifies with the digital goals and has a positive attitude towards the upcoming changes.[7]

Alignment with the corporate vision, goals, strategies, culture, and mindset
In four publications analyzed[8] and in four interviews the alignment and the integration of the digital transformation vision, goals and strategies with the overall corporate goals was identified as success-critical. They need to be linked to the overall business strategy to gain a sustainable competitive advantage. Thus, the questions what the organization's goals are and why it needs digital transformation to achieve them should always be asked together. One interviewee highlighted the importance of the alignment of the digital transformation vision, goals, and strategies with the corporate culture, as they always need to be distinctive and individual to a company.

Definition of clear, tangible, and traceable transformation goals
The definition of clear, tangible, and traceable transformation goals and targets is one success factor for managing a digital transformation, identified in three publications analyzed[9] and three interviews. It is not sufficient to define and communicate a transformative and fascinating vision. The vision needs to be backed by a set of strategic imperatives and goals, tied to specific business outcomes. The goals should be concrete, measurable, and tangible. A study by McKinsey & Company revealed that one of the elements with the greatest influence on success are clear goals for organization's key performance indicators.[10] Moreover, it is

[7] Cf. Reinhardt (2020, p. 76).
[8] Cf. Bürkner et al. (2016, p. 14); Forth et al. (2020, p. 6); Bouée (2015); Mohr (2020, p. 144).
[9] Cf. Martin (2018, pp. 9–10); Forth et al. (2020, p. 6); Mohr (2020, pp. 136–145).
[10] Cf. Martin (2018, p. 10).

important that the goals are clearly formulated, so that the goals and their impact can be understood by a large number of individuals with different functions, educational and hierarchical levels.[11]

Definition of clear, tangible, and traceable transformation strategy and timeline
Not only clear, tangible, and traceable goals are decisive for the success of a digital transformation, but so are tangible and traceable strategies and timelines, as identified in five publications analyzed[12] and in seven interviews. A distinctive digital strategy should consider and incorporate the new ways value can be created with digital technologies—in the online and offline world—and should be connected with the broader vision and goals of the digital transformation. A clear and structured strategy is needed to shift from individual transformation initiatives to the bigger picture of a digital transformation in order to be able to benefit as early as possible from a company-wide approach. From the strategy a clear roadmap should be derived, including traceable phases and milestones. Both, the strategy and the timeline should consider possible interdependencies between different areas and initiatives of the digital transformation.[13]

Organizational breakdown and operationalization of the vision, goals, and strategies
The digital transformation vision, goals, and strategies should be broken down and translated into an actionable business roadmap, addressing use cases, technology, people, and organizational capabilities. These roadmaps should include specific milestones, time frames, as well as financial and operational metrics.[14] Specific actions and measures need to be defined and trickled down to responsible roles or people, in order to ensure accountability. It is critical to success that departments, teams, and individuals can derive their expected contribution to find the best possible implementation within the given framework of the vision, goals, and strategies.[15] The importance of the organizational breakdown

[11] Cf. Martin (2018, p. 10); Forth et al. (2020, p. 6); Mohr (2020, p. 136); Burkacky et al. (2018, p. 2); Westerman et al. (2011, pp. 50–52); Mohr (2020, pp. 136–141); G. C. Kane et al. (2015, p. 14).

[12] Cf. Bürkner et al. (2016, p. 14); Burkacky et al. (2018, pp. 2–3); Westerman et al. (2011, pp. 50–52); Mohr (2020, pp. 136–141); G. C. Kane et al. (2015, pp. 7–14).

[13] Cf. Bürkner et al. (2016, p. 14).

[14] Cf. Bürkner et al. (2016, p. 55).

[15] Cf. Lauer (2021, p. 113); Burkacky et al. (2018, p. 3); Marckstadt et al. (2020, pp. 19–21); Westerman et al. (2011, pp. 52–54).

and operationalization of the vision, goals, and strategies was identified in three publications analyzed[16] and five of the interviews.

Reassessment and adaption of the digital transformation goals and strategies
The importance of the 'Reassessment and adoption of the digital transformation goals and strategies' for a digital transformation's success was identified within one publication[17] and four interviews. As one key capability of digital transformation is the ability to adapt and to stay flexible, it is essential that the scope and priority of the defined goals and strategic indicatives are regularly reassessed, incorporating lessons learned and changes in internal and external factors.[18] Especially in highly dynamic market environments there needs to be a shift from a stable and fixed definition to a dynamic definition of the vision, goals, and strategies, ensuring that the conditions under which the vision, goals and strategies were formulated are still valid.

Engagement and commitment of leadership
Five interviewees highlighted the importance of the commitment of the leadership to the defined digital transformation vision, goals, and strategies. It is decisive that the leadership is committed and supports their realization to drive forward the success of digital transformation. To underpin this commitment, it is important, that the visions and goals are set and communicated by the board and are then carried down through the cascades.

Motivational power of the vision and goals
Three interviewees highlighted the importance of the motivational power of the formulated vision and goals. It needs to be ensured that the vision and goals have the power to address, engage, and motivate employees and to help them to keep in mind the big picture of the digital transformation. It is particularly crucial, that a desirable target state and benefits for the majority of those affected by and involved in the digital transformation are addressed. In this context, the vision and goals need to be fascinating, but still realistic and reachable. They should include motives like performance, power, and social connection and should allay employees' fear of digital transformation.[19]

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[16] Cf. Burkacky et al. (2018, p. 3); Marckstadt et al. (2020, pp. 19–21); Westerman et al. (2011, pp. 52–55).

[17] Cf. Marckstadt et al. (2020, p. 21).

[18] Cf. Marckstadt et al. (2020, p. 21).

[19] Cf. Lauer (2021, pp. 110–111).

Development and adaption of the business model
In the analyzed literature[20] the development and adaption of the current business model in the course of digital transformation are considered as success-critical. A dual perspective is recommended, in which a company continues to operate its current business but at the same time explores and possibly exploits new opportunities, opened up by digitalization, to be integrated into the business model. Herby, it is important to focus on the customer, its needs and demands. A study conducted by Deloitte and the University of St. Gallen revealed that one in two business model transformations is successful if it's triggered by customer needs.[21]

5.2 Focus Area: Leadership

5.2.1 Concept and Contribution to Success

Leaders who successfully initiate and manage a digital transformation represent the first success-critical focus area. A person who successfully fulfills his or her role, initiating and leading a digital transformation, ensures that, in the course of the transformation, willingness to change is built, orientation is provided, motivation is generated and maintained, and that the transformation process itself is managed efficiently.

In the late 1970 s, J.M. Burns introduced two concepts of leadership in his descriptive research on political leaders. He differentiated between 'transforming leadership' and 'transactional leadership'.[22]

The transforming approach fosters a person's "level of consciousness about the importance and value of desired outcomes and the methods of reaching those outcomes"[23]. It is based on the leader's personality, traits, and ability to lead by example. A transforming leader works towards the benefits of the organization, by ensuring efficiency, and by focusing on motivation, inspiration, and communication. A transforming leader must be visionary and authentic, must act as a coach rather than a commander, must not pursue solely selfish motives but rather must strive for success and the sake of the course. His or her personality

[20] Cf. Bürkner et al. (2016, p. 126); Marckstadt et al. (2020, pp. 15–17); Reinhardt (2020, pp. 93–94); Mohr (2020, p. 145).
[21] Cf. Marckstadt et al. (2020, p. 15).
[22] Cf. Burns (1978).
[23] Burns (1978, p. 141).

is characterized by a high degree of purposefulness, willpower, and emotional intelligence.[24]

In contrast, the transactional leader's actions are based on the exchanges between leaders and followers, focusing on the accomplishment of performance objectives, required tasks, and the efficient management of existing processes.[25] Transactional leadership provides the necessary coordination and order of different areas, ensuring efficiency—"that things are done right"[26]. For this, methods originated from the classical and more functional management are used, like rigid goal setting, planning, decision making, and control.

The right mix of these two leadership styles is essential for the success of a digital transformation. To initiate a transformation, a high degree of transforming leadership is necessary, increasing the willingness to change of the ones affected and engaged. When in the course of the process, the transforming leadership manages to motivate and inspire the ones affected and involved, and the willingness to change increases, the organization needs to start building up necessary capabilities. At this time, the need for transactional leadership increases. Although, it is not always possible that the abilities of transactional and transforming leadership are united within one person, a company must ensure that the right mix of leadership is in place.[27]

The specific C-role in which the leadership of the digital transformation manifests will not be discussed in this paper, rather, the focus will be on important leadership attributes, knowledge, and behaviors. Nevertheless, a brief overview of current developments in the distribution of roles will be provided below.

The Chief Information Officer (CIO) as the head of the IT organization has become increasingly important as information technologies have become more prevalent in companies. When IT-based innovations go beyond changes to internal processes, a Chief Digital Officer (CDO) is being implemented frequently. Therefore, in many companies, the role of the Chief Digital Officer (CDO) as the driver of the company's digital transformation is evolving. The CDO is tasked with orchestrating the digital transformation of a company. He supports the Chief Executive Officer (CEO), who is the primary responsible role, in formulating and implementing a dedicated digital transformation strategy. While the CIO plays the role of a strategic IT specialist in the organization, the CDO is the transformation specialist of the overall organization. They should coordinate their activities to

[24] Cf. Lauer (2021, pp. 83–85); McCleskey (2014, pp. 120–121).

[25] Cf. McCleskey (2014, p. 122); Lauer (2021, p. 85).

[26] Lauer (2021, p. 85).

[27] Cf. Lauer (2021, pp. 85–89).

efficiently achieve the goals of digital transformation and thus support the lead CEO.[28]

5.2.2 Success Factors

In total six clusters were derived from the analyzed literature and the conducted interviews that comprise specific success factors about the leadership of a digital transformation. In the following, each identified success factor cluster is described in detail.

Engagement and commitment
Strong leadership is crucial in the context of digital transformation. The digital agenda needs to be driven by the executive management, with commitment, visible engagement, and accountability. This success factor was identified in six publications[29], while it could not be directly identified in any of the interviews. Kane et al. discovered in their research that more than half of surveyed digitally maturing organizations say that their digital agenda is led by a single person or group, including someone at the C-suite or vice president level.[30] Not only the commitment and engagement of top executives are essential for a successful digital transformation, but also the commitment and engagement of the relevant middle management. The middle management must be involved in the planning and execution, ensuring their commitment to the vision, goals, and strategies of the digital transformation. Otherwise, middle managers are at risk to become a source of resistance, not pursuing the 'big picture' of the transformation and defending functional siloes and power bases. If the middle management can be properly engaged in the digital transformation, beneficial multiplier effects that have a positive impact on the organization's willingness to change can be generated.[31]

[28] Cf. Singh et al. (2017).

[29] Cf. Marckstadt et al. (2020, p. 18); Martin (2018, pp. 12–13); Bürkner et al. (2016, pp. 125–126); Forth et al. (2020, p. 13); Reinhardt (2020, pp. 79–80); G. C. Kane et al. (2015).

[30] Cf. Kane et al. (2015, p. 12).

[31] Cf. Marckstadt et al. (2020, p. 18); Martin (2018, pp. 12–13); Bürkner et al. (2016, pp. 125–126); Forth et al. (2020, p. 13); Reinhardt (2020, pp. 79–80); G. C. Kane et al. (2015).

Digital savviness

In a research conducted by the MIT Sloan Management Review, it was revealed that companies with digitally savvy boards outperform their competitors on key metrics such as revenue growth, return on assets, and market cap growth.[32] In another research by Kane et al., it was discovered that in digitally maturing organizations, employees have confidence in leadership's ability and experience to lead the digital strategy, as well as in leadership's understanding of relevant digital trends and emerging technologies.[33] Being a digitally savvy leader is about asking early how trends and emerging technologies can be leveraged to delight customers and to be more efficient. It involves following test-and-learn approaches to strategic planning and experimenting to scale digital transformation success.[34] Thus, having digital skills enables leaders to identify and understand emerging trends and developments, in order to determine how these trends can generate new value or pose a threat to the business. Leaders are enabled to make more informed decisions in an uncertain environment.[35] Likewise, previous experience in a technology leadership role are beneficial, while in-depth technical skills such as programming or data science are not necessary. These digital skills go beyond traditional leadership skills and were identified in five of the interviews and three publications analyzed.[36]

Empowerment, encouragement, and engagement of employees

The ability of leaders to empower, encourage, engage, and purposefully interact with employees is considered as an essential success factor which was identified in five of the publications analyzed[37] and in all of the interviews. Certain aspects were included, which are described in the following:

- The leader does not instruct, but rather holds a kind of mirror in front of his employees, by giving constructive criticism—positive and negative.
- The leader deals with successes and failures and promotes open communication.
- The leader values his employees and trusts in their abilities.

[32] Cf. Weill et al. (2019).

[33] Cf. Kane et al. (2015, p. 12).

[34] Cf. Weill et al. (2019).

[35] Cf. Kane et al. (2019).

[36] Cf. Martin (2018, p. 12); Bürkner et al. (2016, p. 126); Kane et al. (2015, p. 12).

[37] Cf. Martin (2018, pp. 12–13); Lauer (2021, pp. 93–95); Bürkner et al. (2016, p. 15); Forth et al. (2020, p. 17); Bouée (2015); Reinhardt (2020, p. 89).

- The leader paves the way for his employees to achieve set goals and supports them in mastering challenges in a self-organized manner.
- The leader encourages his employees to challenge old ways of working and thinking and promotes openness towards change.
- The leader engages employees early in the process and underpins how employees' contributions help to fulfill the purpose and goals of the digital transformation.

Development and enablement

Companies need to ensure that the development of digital leadership is promoted, otherwise there is a risk that any shortcoming will become a critical bottleneck in the course of the digital transformation. This success factor was identified in four of the publications analyzed[38] and in five of the interviews.

Companies must manage the balancing act between creating leadership momentum and maintaining leadership continuity.[39] To do this, companies can hire a new leader with an unbiased position to challenge and comprehensively change the status quo. Hereby, companies should consciously look for young digitalization talents with entrepreneurial experience and integrate them into their leadership teams. Also, incumbent leaders can create dynamic change by continuously embracing new ideas and impulses.[40]

In order to better prepare incumbent executives for the challenges of digital transformation, targeted capability building fosters a change in their behavior and the development of their digital knowledge base. The leadership should be provided with training and development opportunities and resources to develop digital skills and know-how.[41] To further develop leaders' attitudes and self-leadership, awareness and self-reflection as fundamental competencies should be developed and fostered. Also, they should be encouraged to self-directed learning, taking online and face-to-face courses, reading research reports and case studies, attending technology conferences, and exchanging experiences with digital native colleagues to learn from. In general, each leader is an "expert of his own personality"[42]. Thus, they should articulate in which area further development is really

[38] Cf. Marckstadt et al. (2020, p. 18); Marckstadt et al. (2020, p. 18); G. C. Kane et al. (2015, p. 14); Mohr (2020, p. 143).

[39] Cf. Marckstadt et al. (2020, p. 18);

[40] Cf. Marckstadt et al. (2020, p. 18);

[41] Cf.Marckstadt et al. (2020, p. 18); Kane et al. (2015, p. 14); Mohr (2020, p. 143).

[42] Au (2020, p. 109).

needed.[43] In addition, two interviewees recommended to measure and monitor the development achievements of the leadership and to integrate them into their target definition.

Willingness and ability to deal with change and new perspectives
Part of successful leadership is that when employees are expected to constantly develop, to be open to new things and changes, leaders do the same and lead by example. The leadership's willingness and ability to deal with change and new perspectives were identified as a success factor in four publications analyzed[44] and in six of the interviews. Leaders must never regard the learning processes as completed, previous assumptions must be constantly reconsidered, and the knowledge base must inevitably be expanded. An important leadership expectation in the context of digital transformation is thereby to listen and to learn from the environment—listening to new ideas, listening to talents, and listening to people who can support the success of the digital transformation. Thus, leadership must be open to new ways and methods of thinking and working, and it must be willing and able to abandon old routines and habits.[45]

Definition and communication of transformation's vision, goals, and strategies
The definition and communication of transformation's vision, goals, and strategies was identified within three publications analyzed[46] and five interviews. Leaders must be able to define and communicate a feasible but challenging vision, reachable goals, and purpose-driven strategies. Herby, two prerequisites are of particularly high importance. To successfully establish a vision, goals, and strategies, a leader must be able to convey a sense of purpose to the company and its employees. This purpose helps the workforce to understand what one should do, why and how, fostering self-motivation. This is becoming even more important as the need to not only execute tasks but to understand the background of the tasks grows with increasing qualification. Moreover, a leader must be able to communicate the vision, goals, and strategies convincingly. This is not only about the ability to speak in front of large crowds of people, but to convey one's message and purpose with a lasting impression to those who are affected by and

[43] Cf. Weill et al. (2019).

[44] Cf. Forth et al. (2020, p. 17); Marckstadt et al. (2020, p. 18); Mohr (2020, pp. 145–146); Kane et al. (2015, p. 13).

[45] Cf. Kane et al. (2015, p. 13); Forth et al. (2020, p. 9); Mohr (2020, pp. 145–146); Marckstadt et al. (2020, p. 17); Au (2020, pp. 108–109).

[46] Cf. Westerman et al. (2011, pp. 52–55); Marckstadt et al. (2020, p. 18); Bouée (2015).

engaged in the digital transformation. In order to do so, a leader must be able to communicate in a target group-oriented manner. Moreover, it is necessary to integrate the vision, goals, and strategies into one's own actions, to consistently place them above the own interests and to lead by example.[47]

5.3 Focus Area: Communication

5.3.1 Concept and Contribution to Success

Communication is one of the decisive success-critical focus areas of managing a digital transformation. It fosters transparency, motivation, networking, and conflict resolution and is related to almost all other focus areas.[48] The contribution of communication to the success of a digital transformation strongly depends on whether it is understood and interpreted correctly. Its misinterpretation can lead to major conflicts and transformation obstacles.

In the following, communication is described, using four pairs of opposites.[49]

Communication is either formal or informal. Formal communication often follows a specific structure or channels like meetings with a defined agenda or written communication via email. In contrast, informal communication includes everything outside a formal framework and protocol like private conversations between employees. Informal communication is especially important for the transfer and distribution of knowledge and information within a company. The topics of informal communication can reveal internal resistance towards digital transformation and can be used as a basis to inform and communicate effectively.[50]

The second pair of opposites is symmetric and asymmetric communication. An open-ended interactive communication is referred to as symmetrical, the content of the communication is influenced and determined by both communication parties, like two members of a company talking to each other.[51] In contrast, asymmetric communication is a communication with various stakeholders, whereby the active role of the addressees is limited to reactions or responses to the initiated communication. This communication is initiated by the company to spread

[47] Cf. Lauer (2021, pp. 92–93).

[48] Cf. Lauer (2021, p. 119).

[49] Cf. Lauer (2021, p. 120).

[50] Cf. Lauer (2021, p. 120).

[51] Cf. Osburg (2015, p. 742); Morsing and Schultz (2006, p. 328).

information, when the board for example sends an email to stakeholders, reporting news about the digital transformation.[52] Asymmetric communication should always be complemented with symmetric communication to reduce the risk of people feeling that they are being confronted with a fait accompli and to avoid misunderstandings due to a lack of opportunity to ask questions.[53]

Moreover, communication is either personal, like a face-to-face dialog or medial, like a radio podcast. Especially, personal communication plays a major role in the context of digital transformation, delivering the emotional component of communication.[54] While asymmetric communication is often, but not necessarily medial, symmetric communication can be both—personal and medial. Lauer calls the difference between these two types of communication a continuum which is being increasingly closed by modern communication technologies.[55]

The last pair of opposites is digital and analog. In this context, digital communication does not refer to the modern communication technology, but to the spoken or written word itself. Analog communication refers to gestures, facial expressions, and intonation. These analog parts of communication constitute emotional components that strongly influence if communication is understood correctly.[56]

Lauer considers communication as a catalyst for change management. As communication alone is no guarantee of success, yet a transformation can neither be initiated nor implemented without it. He describes four tasks that communication fulfils as a catalyst of change.[57] These can be applied in an adapted format to the contribution to a successful digital transformation as followed:

– Communication fosters informational transparency. With the help of communication those involved and affected by digital transformation can be sufficiently informed, ensuring that digital transformation takes place as smoothly and efficiently as possible.[58] A study by Capgemini Consulting and the MIT Sloan Management revealed that successful communication not only creates

[52] Cf. Lauer (2021, pp. 120–121); Osburg (2015, p. 742); Morsing and Schultz (2006, pp. 326–327).

[53] Cf. Lauer (2021, p. 121).

[54] Cf. Lauer (2021, p. 121).

[55] Cf. Lauer (2021, p. 121).

[56] Cf. Lauer (2021, p. 121).

[57] Cf. Lauer (2021, p. 122).

[58] Cf. Lauer (2021, p. 122).

awareness, but also increases the level of transparency and trust with open dialog.[59]
- Communication supports identifying and reducing organizational resistance that is not directly apparent. It fosters avoiding psychological defensive reactions against unknown influences or loss of freedom, by communicating what is particularly important to those affected and by addressing their interests, needs, and concerns.[60] Thus, communication contributes to encouraging and motivating employees for digital transformation and to allaying their fear of upcoming changes.
- Communication reinforces successful processes of digital transformation, by promoting employee engagement and creating positive feedback. Communication is not only relevant to initiate a digital transformation, but also to increase motivation and to avoid skepticism during the course of the transformation. Moreover, communication fosters the individual engagement of employees in the transformation process, ensuring that ongoing transformation processes are stimulated.[61]
- Communication promotes social inclusion and integration. Communication is a basis for a successful collaboration, helping to overcome social aversions and to find ways of working together.[62]

5.3.2 Identified Success Factors

In total twelve clusters were derived from the analyzed literature and the conducted interviews that comprise specific success factors, fostering the use of communication as a catalyst for digital transformation. In the following, each identified success factor cluster is described in detail.

Communication of the transformation's vision, goals, and strategies
Especially in the initial phase of a digital transformation, it is essential to communicate the background of the digital transformation, the reason for the special urgency, the defined vision, goals, and strategies and why these are the right ones.

[59] Cf. Westerman et al. (2011, p. 52).
[60] Cf. Lauer (2021, p. 45, p. 122, p. 135); Westerman et al. (2011, p. 52).
[61] Cf. Lauer (2021, p. 122); Mohr (2020, p. 145); Westerman et al. (2011, p. 52).
[62] Cf. Lauer (2021, p. 49, p. 122).

The importance of this success factor is confirmed by six publications[63] and eight interviews. According to a publication by McKinsey & Company, organizations following this success factor are more than three times likelier to succeed in digital transformation.[64] In this context, often the definition and communication of a transformation narrative, as described in section 5.1.2, are mentioned.[65] Specifically, a study by Deloitte and the University of St. Gallen considers the narrative to be a very successful method for uniting the organization behind digital transformation and for mitigating the decline in engagement that is likely to begin 12–18 months after the beginning of the transformation.[66] In this context, Kane et al. highlight that storytelling is a popular means of gaining employee buy-in and organizational traction for digital transformation.[67]

Communication of transformation's timeline and progress

Communicating the timeline of the digital transformation and the upcoming next steps, as well as communicating the transformations' progress and success, are especially important to maintain the motivation for the digital transformation. The relevance of this success factor was confirmed by four publications[68] and the responses of four interviewees. Above all, it is important to communicate regularly and as early as possible. Especially transformation successes should be communicated as quickly as possible, emphasizing to the ones involved and affected that their efforts are paying-off.[69] In this context, key performance indicators (KPI) can be very helpful to report positive changes and results.[70]

Communication of roles, responsibilities, and impacts on individuals

It is particularly important to communicate roles and responsibilities in the context of digital transformation. The impact of the digital transformation on the individual and the expected contribution in terms of time and capacity should be

[63] Cf. Martin (2018, pp. 9–12); Marckstadt et al. (2020, p. 20); Reinhardt (2020, pp. 79–80); Westerman et al. (2011, p. 48); Mohr (2020, p. 145); Kane et al. (2015, p. 11).

[64] Cf. Martin (2018, p. 10).

[65] For example: Cf. Reinhardt (2020, p. 76).

[66] Cf.; Marckstadt et al. (2020, p. 20).

[67] Cf. Kane et al. (2015, p. 144).

[68] Cf. Martin (2018, pp. 9–10); Burkacky et al. (2018, p. 5); Reinhardt (2020, pp. 79–90); Mohr (2020, p. 141).

[69] Cf. Lauer (2021, p. 124).

[70] Cf. Reinhardt (2020, pp. 79–90).

clearly announced. Although this success factor was only referenced in the interviews, an extraordinary importance can be assigned to it, as it was highlighted by seven interviewees. This success factor contributes to easing employees' fears of the transformation and motivating them to engage in the digital transformation.

Implementation of opportunities to ask questions and to provide feedback
The lack of opportunities to ask questions can cause misunderstandings, leading to resistance toward the digital transformation.[71] This risk is outlined by five of the interviewees and one publication[72]. For a successful communication, opportunities for employees to ask questions and to express feedback should be established. Westerman et al. suggest shifting away from a one-way model of communication to implementing opportunities for employees to engage in real dialogs. Specifically, they suggest wikis, discussion forums, blogs as easy tools to implement these opportunities.[73]

Communication of positive and possibly negative aspects of digital transformation and necessary changes
Four of the interviewees and one publication[74] emphasized that not only successes and positive aspects of digital transformation should be communicated, but also possible obstacles and risks of the upcoming changes. Most employees are aware that the digital transformation involve risks and requires high efforts. Therefore, it is important to avoid a lack of information and to communicate openly and honestly about failures and unexpected events. This contributes to the authenticity of the communication and to the trust in the leadership of the digital transformation.[75]

Implementation of communication, supported by leadership
Communication should be supported and conducted by the leadership, to signal the importance of the digital transformation as well as to show appreciation and respect to those affected. Even if it is not possible for leadership to have personal, face-to-face conversations with all affected employees, digital communication technologies enable enterprise-wide, large-scale communication, such as

[71] Cf. Lauer (2021, p. 121).
[72] Cf. Westerman et al. (2011, p. 52).
[73] Cf. Westerman et al. (2011, p. 52).
[74] Cf. Mohr (2020, p. 145).
[75] Cf. Mohr (2020, p. 145).

broadcasts or live-stream meetings in which leadership is actively participating.[76] Referring to this, so called 'show and tell sessions' and 'all-hands meetings' in which top level leadership is involved and available to answer questions as well as to receive feedback are recommended by four interviewees. Lauer recommends a cascading communication. Here, the most important topics are sent asymmetrically from the top level to all employees, and then the middle management conducts a symmetric and personal dialog with their respective teams to discuss further details and questions.[77]

Implementation of target group-oriented communication

Communication should always be adapted to the needs, interests, and the language style of the target group. Lauer and four of the eight interviewees are convinced, that it is essential to adapt the communicated content and the chosen communication channels to the target group, ensuring that the intended message is understood.Thus, no technical jargon or terms or buzzwords should be used that might not be understood by the target group. Rather the communicated content should be kept simple and compact.[78]

Implementation of personal communication

Personal communication, as described in section 5.3.1, plays an important role in a digital transformation. It does not only create an atmosphere of trust, it does also prevent misunderstandings. In personal communication, questions can be asked and answered spontaneously, and the analog parts of communication like gestures and facial expressions lead to a better understanding of the communicated content. Likewise, taking the time to talk to somebody in person demonstrates appreciation.[79] Four interviewees recommend supplementing written communication via email with personal face-to-face communications. One interviewee suggested establishing change agent networks in which individuals representing parts of the company act as multipliers. As multipliers, they communicate important content and news about digital transformation to their business unit via personal communication.

[76] Cf. Westerman et al. (2011, p. 52); Lauer (2021, p. 123).

[77] Cf. Lauer (2021, p. 124).

[78] Cf. Lauer (2021, p. 123).

[79] Cf. Lauer (2021, p. 123).

Communication planning
Another success factor cluster is advanced planning, ensuring a minimum level of communication. This plan can of course be supplemented by spontaneous communication during the course of digital transformation. McKinsey & Company, Lauer, and two interviewees therefore suggest developing a communication plan, determining the key messages and communication channels to each stakeholder along the digital transformation journey.[80]

Communication with stakeholders of the transformation
Stakeholders are all those having a positive or negative interest in a company's digital transformation. They can either be internal or external. Internal stakeholders are the management levels and functional areas, as well as the employees. External stakeholders can be customers, suppliers, but also politicians or trade unions. Although communication primarily focuses on internal stakeholders, external stakeholders should not be neglected.[81] Therefore, communicating frequently with external stakeholders and aligning them throughout the transformation process is one important success factor, that was identified in one publication[82] and one interview. In general, a stakeholder analysis should be carried out to identify relevant stakeholder groups, to assess their power and influence, to estimate their extent of support or resistance, and to define communicative measures.[83] Specifically, one interviewee suggests organizing regular coordination meetings at the board level with external stakeholders to align goals and strategies of the digital transformation.

Communication between employees
Two interviewees pointed out the importance of informal communication between employees across divisions and hierarchies. As described in section 5.3.1, informal communication is especially important to reveal employees' interests, fears, needs, and possible resistances. It also contributes to the transfer and distribution of knowledge. Thus, fostering information communication is an important success factor of digital transformation, enabling employees to share their positive experiences with digital transformation and creating positive multiplier effects.[84]

[80] Cf. Lauer (2021, pp. 132–133); Marckstadt et al. (2020, p. 20).
[81] Cf. Lauer (2021, pp. 132–133).
[82] Cf. Marckstadt et al. (2020, p. 20).
[83] Cf. Lauer (2021, pp. 132–133).
[84] Cf. Lauer (2021, p. 120).

5.4 Focus Area: Digital Culture and Mindset

5.4.1 Concept and Contribution to Success

A company's culture and mindset reflect its personality. They represent a company's unique DNA, having the power to become a competitive advantage. During a digital transformation this competitive advantage can determine its success. In the best case, the corporate culture and mindset act as catalysts for the transformation and drive the transformation process forward. However frequently, the opposite is the case—the corporate culture and mindset represent a pitfall in the digital transformation and hinder its success.[85]

The Cambridge Directory defines corporate culture as "the beliefs and ideas that a company has and the way in which they affect how it does business and how its employees behave"[86].

A more visual description of culture is offered by Edgar H. Schein's 'three-layer cultural model'[87], shown in figure 5.1. It illustrates culture with its visible and invisible elements as an iceberg. At the top of the iceberg are the artifacts—visible elements that allow a first conclusion about the underlying culture. The artifacts are diverse formal cultural manifestos such as the communicated corporate philosophy or the 'look and feel' of the offices. For understanding and interpreting the culture, not only the visible artifacts should be considered but also the underlaying assumptions.[88]

The second layer is no longer directly visible and consists of collective values (norms and philosophies) which are considered ideal by the members of the organization and thus influence their actions. The values are an essential characteristic of culture: culture is a shared understanding of what is valued as important and desirable by several individuals within the company.[89]

Usually there is an overlap with the basic assumptions, which are the third cultural layer. They can hardly be guessed by persons outside the organization. They are deep-seated assumptions that have become self-evident over time and strongly influence the actions, perceptions, and thinking of members of the organization. They form the context in which artifacts must be interpreted. Basic assumptions

[85] Cf. Hess (2019, p. 172).
[86] Cambridge University Press (2014a).
[87] Schein and Schein (2018).
[88] Cf. Hess (2019, p. 173).
[89] Cf. Hess (2019, p. 173–174).

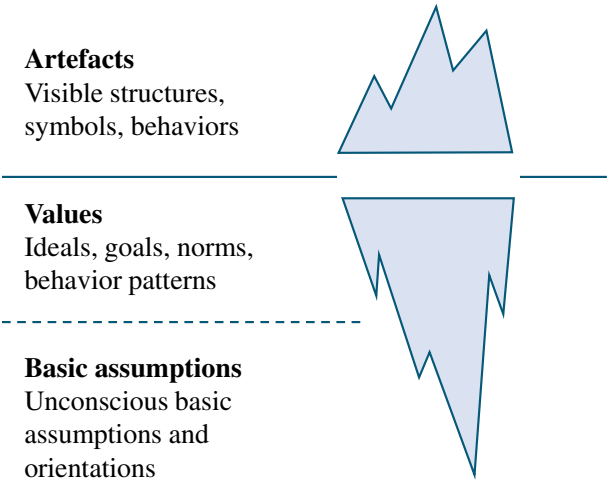

Figure 5.1 Three-layer cultural model. (Source: Based on Schein and Schein (2018))

are developed over time and arise from values that have proven themselves as successful.[90]

During a digital transformation, an organization should develop a digital culture, changing the way individual employees work, behave, and interact with others inside and outside the organization. A digital culture is understood as a "set of values and characteristics behaviors, at personal an organizational level, driving new digitally-enabled ways of thinking, working and interacting with the customer, among employees and business units, and with new digital tools."[91] Having a digital culture supporting change is a prerequisite of digital transformation and an important source of competitiveness.[92]

Mindset is considered as a self-conception, describing the underlying beliefs people have about learning, intelligence, and creativity. It therefore influences people's behaviors, motivations, and interpersonal processes.[93] Mindset is closely

[90] Cf. Hess (2019, p. 173–174).
[91] Romero et al. (2019, p. 5).
[92] Cf. Buvat et al. (2017, pp. 2–3).
[93] Cf. Mindset Works (2017).

linked to the corporate culture and is part of the third cultural layer—the basic assumptions.[94]

In the research paper 'Mindset: The New Psychology of Success', Carol Dweck describes the consequences of thinking that intelligence or personality are considered to be developable or to be fixed. Different systems are depicted regarding the relevance of personnel abilities, potential influence on people's behavior and their prospects of success. It is differentiated between a fixed and a growth mindset.[95]

On the one hand a fixed mindset assumes that characters, intelligences, and creative abilities are static and can't be changed in any meaningful way. People with a fixed mindset avoid failures in order to give the impression of being intelligent and competent at all costs. The success of others is considered as a threat. People with a growth mindset on the other hand assume that character, intelligence, and creative ability aren't static, but rather can be developed. A growth mindset encourages challenges, values criticism, and considers failure as an opportunity to learn and to widen existing abilities. The success of others is considered as a lesson and inspiration.[96]

Employees' mindsets usually become obvious in new difficult situations—in a situation of change. In the course of transformation, there will be lots of new situations, unknown to employees, requiring a change in behavior. An employee with a fixed mindset will perceive the new situation as a threat and will be distressed and anxious. Consequently, the employee is unable to learn and to make rational decisions. In contrast, an employee with a growth mindset will consider the new situation as a challenge, that should be mastered. These challenges enable an employee to learn and to get better.[97] Thus, successfully instilling a growth mindset helps organizations across industries to gain sustainable agility, innovation, commitment, and engagement.[98]

5.4.2 Success Factors

The success factor clusters of digital culture and mindsets are closely intertwined. The clusters describe elements and aspects of a culture and mindset contributing

[94] Cf. Engler (2018, p. 70).

[95] Cf. Dweck (2016).

[96] Cf. Dweck (2016).

[97] Cf. Dweck (2016); Derler and Baer (2019).

[98] Cf. Dweck (2016); Derler and Baer (2019).

to the success of a digital transformation. The clusters are not clearly separable and contain overlapping characteristics.

Culture and mindset, encouraging change and innovation
To respond to an increasingly uncertain environment with constantly emerging digital technologies and to the development of new products, processes and business models, companies need to enable innovation, anticipating market developments and disruptions. A culture, encouraging innovation, fosters employees to challenge old working routines and habits and to experiment with new ideas, technologies, and trends. It gives employees the space and support to experiment with ideas independently and develop them into innovations, thus driving forward the digital transformation of companies. This includes the promotion of a trial-and-error mindset that not only tolerates mistakes but also considers them as necessary, emphasizing the correlation with a culture, encouraging risk and failure. A culture and mindset, encouraging change and innovation are considered highly success-critical for a digital transformation, as it was identified in seven publications analyzed[99] and seven interviews.

Culture and mindset, encouraging risk and failure
Three publications[100] and four interviewees highlight that failures should be considered as learnings and prerequisites for success. Employees are encouraged to take risks and to question the status quo. They are taught that they are allowed to attempt something new, supposedly risky, and that they are allowed to accept possible setbacks in the process, which contribute to the learning process.

Culture and mindset, encouraging collaboration and trust
Change, new ideas, and innovation are fostered through the collaborative efforts among people of different backgrounds. Thus, employees should be encouraged to collaborate and to communicate with colleagues from different areas and different hierarchical levels. Therein, the culture should foster a sense of community, collaboration, and trust within the organization and avoid the envy of others' success and resentment towards colleagues. Employees need to have confidence in their leaders' abilities, in the safety and reliability of their organization, while at the same time leaders need to trust their employees and their ability to master

[99] Cf. Martin (2018, p. 12); Bürkner et al. (2016, p. 126); Forth et al. (2020, p. 17) Burkacky et al. (2018, pp. 8–9); Reinhardt (2020, p. 138); Mohr (2020, pp. 145–146); Kane et al. (2015, p. 9).
[100] Cf. Bürkner et al. (2016, p. 126); Mohr (2020, pp. 145–146); Kane et al. (2015, pp. 9–10).

digital challenges in a self-organized way. The culture and mindset, encouraging collaboration and trust was identified within three publications analyzed[101] and four of the conducted interviews.

Culture and mindset, encouraging decision making processes and diverse opinions
Three interviewees highlight that culture and mindset should convey that, while the status quo should be questioned and challenged, decisions made recently should not be constantly questioned, but should be supported and implemented by all decision makers. The culture and mindset foster the reconciliation of complex and contradictory opinions and promote compromises.

Culture and mindset, encouraging learning and development
One interviewee considers the willingness to learn and to absorb new knowledge as an essential part of culture and mindset in the context of digital transformation. The understanding should be shared that character, intelligence, and creative ability aren't static, but rather can be developed.

Role-modelling culture and mindset
The leadership is committed and sets the example of how to live the targeted culture and mindset. It ensures that the change towards a transformation-enabling culture and mindset is not just written down, but that it is actually lived and embedded throughout the organization. In addition to managers as role models, employees can also trigger positive multiplier effects. Therefore, employees who act innovatively and digitally, both at work and in their lives outside work should be rewarded publicly. This success factor cluster was identified in two publications analyzed[102] and two interviews.

5.5 Focus Area: Capabilities, Talents, and Skills

5.5.1 Concept and Contribution to Success

An organization's ability to act is fundamentally determined by its capabilities, talents, and skills. They enable companies to secure a lasting position of market

[101] Cf. Kane et al. (2015, pp. 9–10); Burkacky et al. (2018, pp. 8–9); Reinhardt (2020, p. 89).
[102] Cf. Bürkner et al. (2016, p. 126); Burkacky et al. (2018, pp. 8–9).

leadership, especially if they are difficult to imitate.[103] In contrast, a lack of capabilities, talents, and skills often impedes business progress and leads to massive problems, endangering a company's existence in times of constantly changing markets.[104]

A business capability defines what a company does. It does not describe where, why, or how something is done—only what is done. It describes the ability, capacity, and expertise what a company does to achieve a specific purpose or result.[105] A company's business capabilities can be narrow or broad, based on assets or processes. They may relate to business activities or to general management activities. In order to be successful, a company needs to identify and assess objectively its capabilities and translate them into a relevant value for the customer. Companies should be able to build new capabilities to respond to the ever-changing demands of the business world.[106]

The resource-based view of a firm[107] is a theory which states that capabilities are the primary sources of competitive advantage for a company. Therefore, they should play a major role in the corporate strategy development. The theory distinguishes between resources and capabilities. Resources are the productive assets owned by the firm, like financial resources, physical assets, brand reputation, technological patens, or employee skills and know-how. Capabilities are what the firm can do with its resources.[108]

A newer capability approach focuses on the requirement that capabilities should provide a sustainable competitive advantage. Thus, that they should be durable and persist over time. This durability is challenged by the ever-changing demands of the business world. The capabilities which are required to meet these challenges are called dynamic capabilities. They can be defined as the capacity of an organization to renew and recreate its strategic resources and capabilities in order to adapt to the needs of a changing environment.[109] A company with dynamic capabilities has for example the capacity to adjust quickly its products to changing customer demands, to enter into new markets, and to develop and

[103] Cf. Barney (1991).
[104] Cf. Hess (2019, p. 194).
[105] Cf. Ulrich (2011, p. 1).
[106] Cf. Pidun (2019, pp. 33–34).
[107] Cf. Barney (1991).
[108] Cf. Barney (1991); Pidun (2019, p. 35).
[109] Cf. Teece et al. (1997).

implement new business models.[110] Thus, dynamic capabilities are needed for a successful digital transformation.

The ability for managerial improvisation as necessary ability to react rapidly and creatively to unexpected events in the face of uncertainty is described in a publication of the MIS Quarterly.[111] The publication presents two digital capabilities that organizations can exploit to foster managerial improvisation and deploy them depending on the nature of the unexpected event—a flexible IT infrastructure (software, hardware, and network) and well-developed information management. In addition to digital capabilities, the authors also identify organizational structures and culture as critical factors, influencing managerial improvisation.[112]

Organizations with a flexible IT infrastructure focus on investing in and managing technologies that are scalable, adaptable, interoperable, and modular, facilitating the development of an information management capability.[113]

When an information management capability is well developed, it enables an organization to "leverage its IT, including tools, and manage the information lifecycle through processes that collect, process, store, create, produce, distribute, and discard "good" information (i.e., information that is timely, accurate, relevant and secure)"[114]. This allows managers to easily share and leverage information.

Contrary to the popular belief, a Harvard Business Review publication pursues the thesis that digital transformation is less about technology and more about people. It argues that almost any technology can be purchased, but successfully adapting to a digital future will require people who are able to implement and use this technology[115]- a conviction that is widespread.[116] The publication recommends companies to focus on retraining and upskilling talents to be better adapt to change.[117] In addition, it is necessary to recruit and hire new talents.[118]

Retraining and upskilling prepare talents for the additional and changed requirements, arising from digital transformation, and enables them to gain new

[110] Cf. Pidun (2019, p. 38).

[111] Cf. Levallet and Chan (2018).

[112] Cf. Levallet and Chan (2018, pp. 1–3).

[113] Cf. Levallet and Chan (2018, p. 3); Kim et al. (2011).

[114] Levallet and Chan (2018, p. 3).

[115] Cf. Frankiewicz and Chamorro-Premuzic (2020, pp. 2–3).

[116] For example: Cf. Kane et al. (2015); Bouée (2015); Tabrizi et al. (2019).

[117] Cf. Frankiewicz and Chamorro-Premuzic (2020, p. 3).

[118] Cf. Martin (2018, S. 6–7); Reinhardt (2020, p. 89).

knowledge and improve individual skills as well as to change behaviors and attitudes.[119] Acquiring new knowledge means acquiring more information about a particular subject, like for example the standards of corporate strategy. Knowledge is a passively structured set of stored data and is a precondition for the acquisition of skills or the change of behaviors and attitudes.[120] For acquiring new skills, the acquisition of new passive knowledge is not sufficient, rather it demands the acquisition of new proficiencies and abilities. Skills can be manual or mental—a manual skill is for example the ability of an operation in production, and in contrast, a mental skill is for example the ability to program a web page.[121] Changing behavior refers to changing values, norms, or attitudes, like for example leadership behavior, work behavior, or behavior towards peers or customers.[122]

A study conducted by McKinsey & Company revealed that companies with winning transformations have a better funded and more robust approach to talent than others do. Investments in digital talent make the transformation success more than three times likelier.[123] The following three reasons, among others, are responsible for this:

- The acquisition and change of values and attitudes among individuals are an important starting point for cultural change in the context of digital transformation, having a positive impact on the general willingness to change and to actively shape the transformation. By changing values and attitudes, the willingness to change and actively shape the transformation is increased and possible resistance is avoided.[124]
- As described in chapter 2.4, changing working environments, working models, and business models in the course of the digital transformation generally require jobs and job profiles to be adapted. This results in a high demand for further qualifications to reduce gaps in qualification.[125]
- In addition, targeted personnel development is considered as an incentive and motivation for employees. So, if a digital transformation entails opportunities

[119] Cf. Lauer (2021, p. 173).
[120] Cf. Lauer (2021, p. 173).
[121] Cf. Lauer (2021, p. 173).
[122] Cf. Lauer (2021, p. 173).
[123] Cf. Martin (2018, pp. 6–7).
[124] Cf. Lauer (2021, p. 175).
[125] Cf. Lauer (2021, p. 175).

for further training, this can have a positive influence on the willingness to change and to actively shape the transformation.[126]

5.5.2 Success Factors

In total four clusters were derived from the analyzed literature and the conducted interviews that comprise specific success factors, fostering capabilities, talents, and skills. In the following, each identified success factor cluster is described in detail.

Development and enablement of digital talents and skills

As described above, retraining and upskilling prepare talents for the additional and changed requirements, arising from digital transformation.[127] Consistent with this finding, the 'Development and enablement of digital talents and skills' was identified as a success factor in seven publications analyzed[128] and in six interviews. For a successful digital transformation, companies need to build and develop the intended knowledge, skills, and behaviors at all organizational levels, regardless of hierarchy, department, location, or range of responsibilities.[129]

Employees need to be provided with the resources they need to develop the required knowledge, skills, and behaviors. Development measures should always be tailored to the person to be trained and to be derived from the goals of the digital transformation. Therefore, it needs to be analyzed which requirements in the respective position will be particularly important in the future and where qualification deficits exist. Personalized training opportunities increase cost efficiency and contribute to employee self-fulfillment. They should consist of a mix of on-the-job measures, taking place parallel to the actual work, and off-the-job measures, taking place outside the actual workplace.[130]

One possibility for on-the-job development is job rotation. These are planned changes of activity within the company that take place either across several

[126] Cf. Lauer (2021, p. 175).

[127] Cf. Lauer (2021, p. 173).

[128] Cf. Martin (2018, pp. 6–7); Bürkner et al. (2016, pp. 125–126); Forth et al. (2020, pp. 15–16); Burkacky et al. (2018, pp. 6–7); Reinhardt (2020, pp. 89–94); Mohr (2020, p. 146); Kane et al. (2015, p. 14).

[129] Cf. Reinhardt (2020, p. 89).

[130] Cf. Lauer (2021, pp. 177–180).

functional areas or within one functional area. Job rotations aim at broadening the horizon of knowledge and experience. Another possibility for on-the-job development is coaching and monitoring. Here, employees are accompanied by experienced employees in their daily work, to receive multidimensional training in terms of knowledge, skills, and behavior.[131]

Seminars, trainings, or e-learning are examples of Off-the-job training. Seminars and trainings are classic forms of personnel development, where a high amount of knowledge and skills is conveyed in a structured way in a short period of time. E-learning is a computer-supported, self-directed form of learning, opening up a high degree of time flexibility, but requiring a high degree of self-discipline from the participant.[132]

Recruitment and hiring of digital talents and skills

According to the study by Westerman et al., companies find it necessary to acquire talents from outside the organization besides retraining and upskilling the existing workforce to meet the requirements of digital transformation.[133] This thesis is confirmed by five additional publications analyzed.[134]

Recruiting and selecting digital talents is different from recruiting traditional employees. Digital employees value their work environment, the products, and projects they are building, the vision and value proposition a potential employer is pursuing more than a competitive pay.[135] Thus, the recruiting and selection strategies to acquire new digital talents needs to be redesigned. As digital employees use online tools and communities to search their job, the recruiting processes need to include social media and online networking platforms that might be specific to this recruiting group.[136] In the selection process a personal touch should be maintained to show personal appreciation.[137] Moreover, recruiters need to acquire new capabilities to speak the language of the targeted group and to be able to speak with the candidates about topics that are relevant to them.[138] Developing own sourcing platforms, like for example hosting online competitions has proven

[131] Cf. Lauer (2021, pp. 179–180).

[132] Cf. Lauer (2021, p. 180).

[133] Cf. Westerman et al. (2011, p. 51).

[134] Cf. Martin (2018, pp. 6–7); Bürkner et al. (2016, pp. 125–126); Burkacky et al. (2018, pp. 6–7); Reinhardt (2020, p. 89); Mohr (2020, p. 146).

[135] Cf. Bhens et al. (2016, p. 6); Strack et al. (2017, S. 8).

[136] Cf. Strack et al. (2017, pp. 8–9).

[137] Cf. Strack et al. (2017, p. 11).

[138] Cf. Bhens et al. (2016, pp. 7–8).

successful.[139] A study conducted by McKinsey & Company revealed that digital transformation success is at least twice as likely at organizations that run innovative recruiting campaigns or host technology conferences or 'hackathons'.[140] Another option for recruiting new talents is acquiring a startup that has certain needed capabilities, the so called 'aqui-hire' approach.[141]

Digital savviness and desired knowledge, skills, and behaviors of employees
As already discussed, digital transformation is more about people than technology. Thus, the most important digital skills are soft skills rather than hard skills. No one can say for sure what the most important hard skills of the future will be. However, it is certain that the hard skills currently in demand are only temporary and may soon become obsolete. Of course, having a certain level of technological understanding, processual and specialist knowledge is highly relevant. However, it is more important to be able to quickly acquire new knowledge and skills. Therefore, companies should invest specifically in talents that are adaptable, curious, flexible, eager to learn, and interested in the skills, trends, and technologies that are in demand.[142]

In seven interviews, the willingness and ability to change and to engage with new and complex perspectives and tasks were described as particularly critical to success. Likewise, seven interviews emphasized that employees should have very high communication skills, enabling them to work with different characters, build a network, and promote the exchange of information and knowledge across projects.

Identification and development of capabilities
Sustainable digital transformation depends significantly on the identification and development of capabilities, as identified in eight publications analyzed[143]. A systematic approach, ensuring that leaders devote sufficient resources and attention, in which necessary capabilities are identified, prioritized, developed, and scaled up, is critical to the success of a digital transformation.[144]

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[139] Cf. Bhens et al. (2016, p. 8).

[140] Cf. Martin (2018, p. 8).

[141] Cf. Strack et al. (2017, p. 9); Bhens et al. (2016, p. 9).

[142] Cf. Frankiewicz and Chamorro-Premuzic (2020, p. 4).

[143] Cf. Bürkner et al. (2016, p. 14); Burkacky et al. (2018, pp. 6–7); Bouée (2015); Marckstadt et al. (2020, p. 16); Reinhardt (2020, 93-94) Westerman et al. (2011, pp. 48–50); Mohr (2020, p. 145); Kane et al. (2015, p. 8).

[144] Cf. Bürkner et al. (2016, pp. 87–100).

When identifying capabilities, the approach of organizational ambidexterity has proven to be successful. Following this, companies adopt a dual perspective—in the sense of exploration, new capabilities need to be identified and developed in order to pursue new ways of generating value and working, and in the sense of exploitation, existing capabilities need to be further refined and expanded.[145]

A systematic approach for the implementation and sustainable development of capabilities needs to be developed, by identifying the gaps between the current and target capabilities and by determining specific measures to support employees in developing these capabilities.[146] As described in the cluster 'Development and enablement of digital talent and skills', there are different opportunities for retraining and upskilling.

To sustainably scale up capabilities, companies need to ensure that they are embedded in the company's DNA. To do this, it must actively change both the hard elements of the organization, such as IT systems, and the softer elements, such as skills, behavior, performance evaluations, incentives, and corporate culture.[147]

5.6 Focus Area: Governance

5.6.1 Concept and Contribution to Success

Corporate governance principles and standards refer to the legal and factual regulatory framework for managing and monitoring a company. It encompasses the roles, competencies, and mechanisms, defining the interactions of corporate bodies. Corporate governance aims to the achievement of strategic goals and the sustainable management of resources, considering the risks specific to the company.[148]

In a digital transformation, it is often challenging to steer a company's efforts in one common direction. Large and complex companies in particular face the problem that, despite an engaging vision, not all executives are moving in the same direction. Some executives will embrace the committed direction, while other executives will try to ignore it. Moreover, some departments may not be flexible enough or motivated to embrace the digital transformation, while other

[145] Cf. Reinhardt (2020, pp. 93–94); Mohr (2020, p. 145); Marckstadt et al. (2020, p. 16).
[146] Cf. Bürkner et al. (2016, pp. 103–104).
[147] Cf. Bürkner et al. (2016, p. 107).
[148] Cf. Baurschmid (2005, p. 451).

departments approach the transformation and take a risk before thinking through the regulatory, security, and organizational risks. Hereby, governance plays a fundamental role in providing the steering wheel and guard rails to guide a company's digital activities in the committed direction of the digital transformation.[149] Governance supports the management of risks associated with a digital transformation, driving forward its success as well as enabling the development of new digital capabilities.[150]

Governance is highly interrelated with the other success-critical focus areas, as it includes questions like clear roles (discussed in section 5.7.2), strategic alignment of initiatives (discussed in section 5.7.2), communication (discussed in section 5.3.2), and leadership (discussed in section 5.2.2).

5.6.2 Success Factors

The importance of governance for the success of a digital transformation was identified in six interviews and in nine publications[151]. Due to the high diversity of the statements, no clear success factor clusters could be identified. However, the following success factors could be derived:[152]

- Governance needs to be aligned with the corporate vision and goals and complement the culture and mindset. In this way, governance should contribute to the flexibility of a company, by providing the steering wheel and guard rails, guiding a company in the targeted direction.[153] Moreover, governance needs to ensure that, even in critical situations, the organization continues to pursue the goals and strategy of digital transformation. The conservative element of an organization is often underestimated, so that governance needs to ensure that a transformation does not fail due to the organization's inertia.
- Governance establishes guidelines for collaboration and communication with internal and external parties. Therein, governance prevents potential security, regulatory, and integration challenges that may arise when employees

[149] Cf. Westerman et al. (2014, p. 133).

[150] Cf. Westerman et al. (2014, pp. 139–140).

[151] Cf. Burkacky et al. (2018, pp. 5–9); Marckstadt et al. (2020, pp. 16–17); Westerman et al. (2011, pp. 52–55); Mohr (2020, pp. 141–144); Reinhardt (2020, p. 86); Bouée (2015); Forth et al. (2020, p. 17); Bürkner et al. (2016, p. 15); Martin (2018, pp. 9–10).

[152] Where no source is defined, the explanations are based on the interviews.

[153] Cf. Westerman et al. (2014, pp. 133).

find their own ways to collaborate outside the company's official sanctioned approaches.[154]

- Governance assists when conflicts arise that are caused by opposing and contradictory goals. To find solutions, governance principles should help to balance these conflicts and find compromises.
- Governance anchors a decision-making body into the organization and defines guidelines and regulatory for decision-making processes. Companies need to adapt their decision-making processes to become more agile, and to find appropriate strategic responses to the new imperatives of digital transformation, like the use of digital technologies, structural and contextual changes, and changes in value creation.[155] Therein, the definition of relevant groups that need to be involved in decisions across the organization is success-critical. Moreover, turning insights from data into decision-relevant actions becomes an important competitive advantage to implement data-driven decisions.[156] According to a publication by McKinsey & Company, the increase in data-based decision making can more than double the likelihood of a digital transformation's success.[157]
- Governance determines responsibilities, and how the organization is empowered to contribute to the digital transformation. A digital transformation requires the serious investment of money and other resources. Generally, companies have fewer resources available than the need for financing the digital transformation. Therefore, it is crucial to define processes and methods that govern the release of investments and resources to digital transformation initiatives, advancing the vision and implementing new ideas.[158] Budgeting usually follows three main objectives: Motivating and rewarding performance by setting goals; coordinating resources by predicting financial results; exercising control by setting cost limits and allocating costs.[159] However, increased uncertainty and volatility make it difficult to achieve these objectives. Because the conditions under which targets were set are often no longer valid, comparing actual results to budgets no longer provides a reliable indication of

[154] Cf. Westerman et al. (2014, pp. 140).

[155] Cf. Jöhnk (2020, p. 6).

[156] Cf. Martin (2018, p. 10); Bouée (2015); Reinhardt (2020, p. 86); Ahmed et al. (2021, pp. 716–717); Bonnet and Westerman (2020).

[157] Cf. Martin (2018, p. 10).

[158] Cf. Burkacky et al. (2018, pp. 5–8); Mohr (2020, p. 144); Westerman et al. (2011, pp. 52–54).

[159] Cf. Stange and Roos, (2020, p. 1).

manager performance. Detailed planning over long time horizons is also becoming increasingly difficult. In addition, leadership needs to be able to quickly react to changing circumstances. Managing by rigid budget constraints is becoming less and less useful.[160] This was further highlighted in the interviews: It is critical to the success of a digital transformation to refrain from traditional and rigid budgeting methods.
- Governance should be valid companywide and must be supported across the organization as well as exemplified by the leadership.
- Governance should not be considered as a static set of guidelines. It should rather be adapted during the course of digital transformation as digital capabilities grow and the competitive situation changes.

5.7 Focus Area: Organization, Coordination, and Roles

5.7.1 Concept and Contribution to Success

Achieving and sustaining digital transformation require new alignments and adjustments in the design of organizations. Companies are facing the challenge of developing a structured and coordinated digital transformation approach based on several unaligned digital initiatives.[161] In order for the transformation to be deeply anchored in the organization, companies need to review their organizational structures for their suitability for a digital transformation and adapt them if necessary.[162] Traditional bureaucratic organizational models, characterized by silos and hierarchical levels, are often still focused on the efficient provision and incremental development of their existing products. Thus, they are too rigid to enable the flexibility required to respond to the constantly changing market and customer requirements and the resulting need to constantly develop new products, business models, and the underlying processes and structures.[163] As a consequence, a more modular orientation of the organization is required, in which

[160] Cf. Stange and Roos, (2020, pp. 1–4).

[161] Cf. Westerman et al. (2011, pp. 53–55).

[162] Cf. Bürkner et al. (2016, pp. 53–54).

[163] Cf. Hess (2019, p. 162); Bürkner et al. (2016, pp. 53–54); Marckstadt et al. (2020, p. 19); Bouée (2015).

hierarchical levels are reduced, decision-making is decentralized, and decentralized units are enabled to contribute to the digital transformation.[164] A systematic and structured approach, that integrates digital transformation into the corporate organization, coordinates individual transformation initiatives, and defines clear roles and responsibilities, is therefore essential.[165]

Ebers (2017) describes two contrasting approaches for embedding innovation activities into the organization that can be applied to embedding digital transformation into the organization—the 'autonomous model' and the 'integrated model' (shown in figure 5.2).[166]

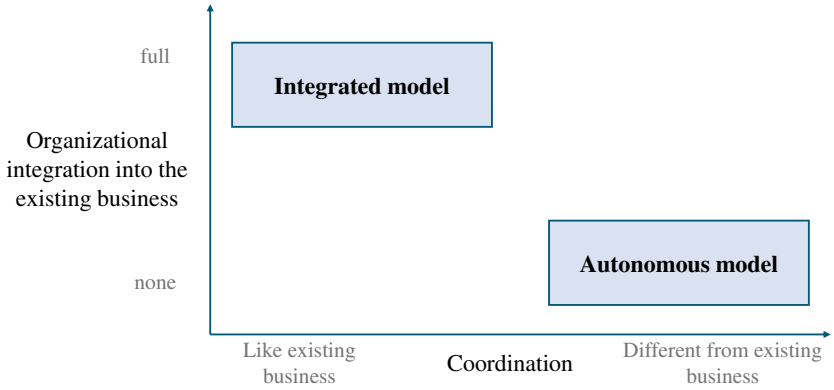

Figure 5.2 Organizational models for digital transformation. (Source: Based on Ebers (2017, p. 86))

– The *autonomous model* consciously separates innovative digital transformation activities into a dedicated unit in order to reduce internal competition with the existing business. It primarily promotes the ability to adapt flexibly and quickly to changing environmental conditions. In the autonomous model, exploitation and exploration in the sense of ambidexterity[167] are structurally separated. The autonomous unit enables faster recognition and exploitation of innovations, while the existing business units are tasked with the exploitation.

[164] Cf. Bürkner et al. (2016, pp. 53–54); Marckstadt et al. (2020, p. 19); Bouée (2015).

[165] Cf. Martin (2018, p. 12);

[166] Cf. Ebers (2017); Hess (2019, p. 166).

[167] On page 55 a detailed description of the concept of ambidexterity can be found.

The autonomous unit is not measured against the same targets as the existing business; it does not have to prioritize short term projects that are already profitable at the outset over innovations that generate value in the long term. In addition, conflicts regarding resource allocations are prevented, making it easier for employees to take initiative on their own and to drive the digital transformation forward.[168]

– According to the *integrated model* for embedding digital transformation, the organizational units, which are responsible for the existing business in the sense of exploration, are also expected to simultaneously generate and implement new business in the sense of exploration. Innovation is incorporated into the existing structure of the company as an additional business activity. Potentials and innovations generated from the integrated model are usually realizable and marketable. Since these tend to be more oriented towards existing needs and not primarily towards the goal of a high degree of technological novelty, they tend to lead to incremental improvements (exploitation) rather than to actually disruptive innovations in the sense of exploration.[169]

5.7.2 Success Factors

In total six clusters were derived from the analyzed literature and the conducted interviews for the success-critical focus area of 'Organization, coordination, and roles'. In the following, each identified success factor cluster is described in detail.

Coordination and integration of the digital transformation and its initiatives into the organization

The coordination of the digital transformation and digital initiatives was identified as critical to success within the literature[170] and the interviews. A systematic and structured approach, that is flexible enough to accommodate different types of initiatives while providing sufficient guidance to achieve strategic alignment and efficiency, is required.[171] The development of the coordination approach should

[168] Cf. Hess (2019, pp. 166–167); Ebers (2017, pp. 99–100).

[169] Cf. Ebers (2017, pp. 85–88); Hess (2019, pp. 167–168).

[170] Cf. Martin (2018, p. 12); Bürkner et al. (2016, p. 15); Bürkner et al. (2016, pp. 125–126); Burkacky et al. (2018, 3–9); Bouée (2015); Marckstadt et al. (2020, pp. 16–21); Reinhardt (2020, pp. 79–94); Westerman et al. (2011, p. 55).

[171] Cf. Obwegeser et al. (2020).

be accompanied by the definition and implementation of decision-making processes, evaluation models for the transformation initiatives, and guidelines for designing an initiative, that are embedded in the governance.

Through the interviews conducted, the integrated and the autonomous organizational model of digital transformation were confirmed. In this context two interviewees consider it especially critical to success that companies adopt an integrating and coordinating approach for digital transformation initiatives that is aligned with the complexity of the targeted transformation, their willingness and ability to change, as well as the culture and mindset.

In the study by Westerman et al., the two approaches are further specified in four models for the organization and coordination of a digital transformation, differing in their degree of coordination and sharing: the 'silo'[172], 'digital hub'[173], 'central coordination'[174], and 'global'[175] approach. In the research, no model is identified that clearly outperforms the others. Rather, it is generally considered as success-critical that companies implement an effective digital coordination of their digital transformation initiatives.

In addition, it was identified as critical to success that a central transformation body is established, such as a 'Digital Transformation Management Office' (TMO), which is mandated by the executive board to steer the transformation. The TMO coordinates the digital transformation, synchronizes, and prioritizes its initiatives across the company, by implementing strategic decisions, efficiently monitoring its progress, as well as by engaging and aligning with stakeholders.[176] Digital transformation initiatives can be prioritized based on their value contribution to achieving the digital transformation goals and on their feasibility.[177]

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[172] In this model, each business unit can set its own strategy and budget for digital initiatives. Digital activities are developed and managed in the individual business units, without coordination at the corporate level.

[173] A central unit defines a uniform digital strategy, whereby local business units can derive their own strategies. Individual local business units develop and manage the operation of digital initiatives but must leverage solutions and resources from the central business unit when available.

[174] A unified digital strategy is defined at the corporate level. Local business units develop and manage digital initiatives which are funded and coordinated at the corporate level.

[175] A unified digital strategy is defined by a dedicated business unit. Local business units develop and manage digital initiatives but must leverage solutions and resources from the central business unit when available. Local business units' digital strategies and budgets are coordinated across the enterprise.

[176] Cf. Martin (2018, p. 12); Marckstadt et al. (2020, p. 19).

[177] Cf. Obwegeser et al. (2020).

In addition to the overarching coordination of the digital transformation and the transformation initiatives, the alignment and collaboration between the individual initiatives were identified as critical to success in five interviews. The interviewees considered cross-initiative communication and the exchange of information to be particularly relevant, ensuring that a common direction is being pursued and that the goals of digital transformation are being jointly driven forward. For this purpose, there should be a regular exchange about transformation progress, obstacles and successes, as well as changes in external and internal circumstances, that could have an impact on the transformation process. A digital platform to support the exchange of information, on which all transformation initiatives can transparently document their progress and results, has proven to be particularly helpful.

(Re-)Definition of roles and responsibilities

Reinhardt describes the definition of new role identities and new role assignments as a prerequisite for establishing an organization aligned with the requirements of ambidexterity.[178] The clear definition of roles supports accountability and avoids ambiguity about responsibilities and the pursued direction of the digital transformation.[179] It creates the necessary sense of responsibility and accountability.[180]

It was identified as essential for the success of a digital transformation that roles and responsibilities are revised and, if necessary, redefined.[181] The interviews highlighted that conflicts can be avoided by defining and planning roles and responsibilities in detail as part of a digital transformation. Six general roles were identified that are relevant for the success of a digital transformation, whereby one role can be filled by several people, depending on effort and capacity.

– *Overarching managing roles:* The role of the overarching transformation manager always considers the long-term perspective of digital transformation and aligns it with the overarching goals of the company. In case of arising conflicts

[178] Cf. Reinhardt (2020, pp. 93–95).

[179] Cf. Bürkner et al. (2016, p. 54).

[180] According to Bürkner et al., Forth et al., Burkacky et al., holding people accountable within the digital transformation is important. (Cf. Bürkner et al. (2016, pp. 125–126); Forth et al. (2020, p. 13); Burkacky et al. (2018, pp. 8–9)) Marckstadt et al. (2020, p. 9) point out the importance of a sense of responsibility.

[181] Cf. Martin (2018, p. 12); Marckstadt et al. (2020, p. 21).

or diverging opinions, it makes sure that the goals of the digital transformation are being pursued. As a sponsor, this role makes investment, capacity, and prioritization decisions.

- *Managing and coordinating roles:* For each digital transformation initiative, a pacemaker is needed to drive the success of the specific initiatives and to actively manage goal deviations. The role fosters communication and collaboration across transformation-initiatives and coordinates interdependencies with other topics. Moreover, it is leading its team, by distributing responsibilities and tasks as well as by empowering and enabling it for self-organization.
- *Business roles:* Business-oriented roles have specific process knowledge. They support a digital transformation initiative with their knowledge of the goals and requirements of a specific business area in the development of a business- and customer-oriented solution. The role can assess whether a developed solution can add value to the specific area.
- *Technical roles:* The technical roles have a thorough understanding of current and emerging technologies, systems, and their implementation options. They can translate the requirements of the digital transformation initiative into requirements for IT and can therefore assess the technical feasibility of an initiative.
- *Integrator roles:* Integrator roles are employees who translate and integrate new digital transformation technologies, methods, and processes into existing ways of working. While doing so, they consider dependencies and interfaces across multiple transformation initiatives.
- *Change supportive roles:* This role ensures that the emerging requirements in the context of digital transformation are translated into targeted mindsets, skills, employee behavior, and organizational structures so that these can serve as the basis for the upcoming change. It accompanies the organization on its transformation path.
- *Ambassador roles:* Ambassadors spread their knowledge and positive experiences of digital transformation within the organization and among their colleagues and create positive multiplier effects. In this way, they help to motivate and overcome transformation barriers and resistances.

5.8 Focus Area: Management Methodologies

5.8.1 Concept and Contribution to Success

As described in chapter 3.4, this work focuses on managing the digital transformation. This requires the application of specific methodologies that enable the success of a digital transformation. A methodology describes the general strategy to solve a problem, functioning as a guideline to allow the practitioner to make choices within a certain set of rules.[182]

For the management of a digital transformation, it should be determined on a company-specific basis which methodologies can be exploited to promote the success of the transformation. Herby, it is important to align the methodologies with the goals of the transformation as well as working procedures, the prevailing corporate culture and mindset.

The success-critical focus area 'Management methodologies' is to be understood as a framework containing possible applicable methodologies that can be used to fulfill the tasks associated with managing the digital transformation. This framework must be specifically 'filled' when it is applied in a company. The following subchapter explains exemplary methodologies that were identified as particularly helpful in the analysis of the selected literature and in the interviews.

5.8.2 Success Factors

Implementation of methodologies to identify, test, and integrate new ideas, ways of working, and technologies

It was revealed success-critical that companies are able to adapt existing processes, ways of working and technologies to the requirements of a revamped digital economy and are able to integrate new ones into the existing working environment. Therein, methodologies that provide a concrete framework for identifying, testing, and integrating new ideas, ways of working, and technologies into the existing working environment were identified as a success factor in five publications analyzed[183] and two interviews.

It is recommended to equally develop and implement methodologies for exploration and exploitation of existing ways of working, according to the concept of

[182] Cf. The Open University (2015).

[183] Cf. Martin (2018, p. 12); Marckstadt et al. (2020, pp. 17–27); Reinhardt (2020, pp. 85–94); Westerman et al. (2011, pp. 48–50); Mohr (2020, pp. 136–146).

ambidexterity, explained in section 5.5.2. Thus, on the one hand, methodologies for discovering new possibilities, and building new capabilities, challenging existing ways of working and finding synergies between existing and new routines, should be implemented. On the other hand, methodologies should be implemented that optimize the existing business in the sense of exploitation.[184] Herby, it is important to develop and pursue a methodical approach that starts from existing conditions and processes in the company as well as from future customer requirements and uncovers new potentials that can be exploited with modern technologies.[185] In addition, methodologies should foster actions that enable noticeable improvements relatively easily and with little effort. Quick wins should be identified, implemented, and then communicated as early as possible.[186] One possibility is the implementation of pilot projects.

Implementation of pilot projects

In two of the publications analyzed[187] and in two interviews, the implementation of pilot projects was identified as a success factor. Pilot projects are used to check whether the framework defined for an idea and the estimate of technical feasibility are realistic. Small cross-functional teams create a prototype of something new, e.g., a product, a service, or a planned process improvement. The prototype created is tested live as soon as possible, in order to gather feedback, and subsequently iterated based on lessons learned.[188] Closely linked to the implementation of pilot projects is a culture and mindset, encouraging change and innovation as well as risk and failure, discussed in section 5.4.2. Pilot projects promote the mindset that something new needs to be tested quickly in order to fail or succeed quickly. On the one hand, failing fast leads to learning and further development of the team. On the other hand, quickly achieved successes can be used for communication of success, representing another success factor, discussed in section 5.3.2.

[184] Cf. Reinhardt (2020, p. 93).

[185] Cf. Mohr (2020, p. 136).

[186] Cf. Mohr (2020, p. 141); Burkacky et al. (2018, p. 5).

[187] Cf. Bürkner et al. (2016, p. 14); Burkacky et al.(2018, p. 5).

[188] Cf. Burkacky et al. (2018, pp. 4–6); Bürkner et al. (2016, p. 116); Forth et al. (2020, p. 6); Westerman et al. (2011, p. 55).

Implementation of methodologies to monitor the transformation's success and progress

Monitoring the progress of a digital transformation is another success-critical factor which, according to a study by Forth et al., is only implemented successfully at two out of five companies.[189] It was identified in six publications analyzed[190] and seven interviews. The progress should be tracked regularly at both the overall transformation and the initiative level. This includes establishing a clear mandate with responsibilities for monitoring the progress and for holding people accountable for their delivery performance.[191] A set of transparent, detailed, and critical metrics needs to be defined that is linked to the strategic intent and business outcomes, with an understanding of underlying operational drivers. These metrics should not only include financial or operational key performance indicators (KPIs), but should also include cultural topics, employee satisfaction, organizational measures, or capability-related metrics, like the percentage of digitally trained staff or digital-talent turnover.[192] Setting clear targets for the organization's key metrics can double the likelihood of digital transformation's success, according to a study, published by McKinsey & Company.[193]

In addition to the already described aspects, further success factors regarding the monitoring a digital transformation were identified in the interviews.

- The defined strategies and roadmaps of the digital transformation should serve as basis for monitoring the progress of the digital transformation.
- When selecting metrics, it should be ensured that severe simplifications are avoided, as important relationships and dependencies could otherwise be neglected.
- The defined processes and methods for monitoring and reviewing the progress of the digital transformation should foster flexibility and allow rapid responsiveness in a dynamic environment.
- The progress of the digital transformation should not only be reviewed, but also made available as transparent information.

[189] Cf. Forth et al. (2020, p. 21).

[190] Cf. Martin (2018, pp. 9–10); Forth et al. (2020, pp. 6–20); Burkacky et al. (2018, p. 3); Marckstadt et al. (2020, p. 19); Reinhardt (2020, pp. 79–80); Westerman et al. (2011, p. 52–55).

[191] Cf.Marckstadt et al. (2020, p. 19).

[192] Cf. Forth et al. (2020, pp. 21–22); Burkacky et al. (2018, p. 3).

[193] Cf. Martin (2018).

- One interviewee recommended the implementation of a trend radar to classify technologies and trends according to their relevance and maturity in time horizons in which they should be considered. This should then be used as a basis for monitoring the progress of the digital transformation.
- In the accompanied transformations, it has proven particularly successful to formulate user stories, representing specific tasks and requirements, whose processing status is tracked in order to monitor the progress of the digital transformation.

Implementation of change management

In three publications analyzed[194] and in six interviews, the importance of change management for a digital transformation was highlighted. Change management is a complex task that aims at bringing together constructively the most diverse interests within a digital transformation. It includes for example to prepare the employees for the upcoming changes, to inform and accompany them during the change process, to ensure that the outcomes of digital transformation are accepted within the organization, to engage and empower employees, as well as to adapt new leadership styles.[195] Thus, the 'Implementation of change management' is highly interrelated with other focus areas, like 'Leadership', 'Capabilities, talents, and skills', as well as 'Culture and mindset'.

As described in chapter 2, digital transformation is technology-driven. With the help of IT, new approaches are to be developed that include value-adding profitable approaches but also potential risks. Hereby, technology is considered to be a catalyst for business change. This approach can be referred to as 'technochange', including both, IT and organizational change.[196] However, it differs from IT projects and classic organizational change programs. IT change focuses on improving technical performance, while technochange involves great potential impacts on 'the users' that can be people, processes, and organizational performance. Organizational change management activities support a successful technochange, but they are not sufficient, as they do not address the unique aspect of IT-driven organizational change.[197] Markus (2004) suggests an integrating solution of technical and organizational approaches as critical to success for technochanges, characterized by the following three aspects:

[194] Cf. Bürkner et al. (2016, p. 15); Marckstadt et al. (2020, p. 18); Reinhardt (2020, p. 207).
[195] Cf. Lauer (2021, pp. 3–8).
[196] Cf. Markus (2004, pp. 4–5).
[197] Cf. Markus (2004, pp. 5–6).

- *Completeness:* Organizations need to implement complementary organizational changes to transform IT into a complete technochange solution. Otherwise, there is a risk that the technology will not be adopted and used, or the technology will be used in a way that reproduces old patterns of work, or the technology will be used as expected but the desired benefits will not be delivered. Complementary changes include for example changes in business processes, new job designs, new skills training, restructuring departments, management changes, or new performance measurements.[198]
- *Implementability:* The technochange solution is designed to be adopted and used. Technochange often fails because it conflicts with existing organizational structures, cultures, or practices, causing resistance to change. To prevent resistance, organizations need to understand where resistance comes from and need to define measures to overcome it. The three main reasons for resistance against technochange are task or business process misfit, cultural misfit, and incentive misfit.[199]
- *Appropriation of benefits:* The efforts put into technochange must turn potential benefits into measurable organizational results. Therefore, changes must be made in measures and rewards as part of a complete technochange solution.[200]

Implementation of methodologies to empower and engage the organization

Involving the affected organization and employees in the digital transformation proved to be a crucial success factor in the analysis of the literature[201] and the interviews conducted. Engaging employees in the transformation process increases their motivation and reduces resistance to imminent change.[202] Moreover, engaging the affected organization has a positive impact on the substantive results of a transformation. As the combination and transfer of knowledge of different employees can lead to better results.[203]

By engaging and actively involving the business units and employees in the digital transformation, they are not only confronted with passive knowledge and presented with a fait accompli; rather, they play an active role in the development process and thus contribute their input and feedback. As a result, changes can be

[198] Cf. Markus (2004, pp. 13–14).

[199] Cf. Markus (2004, pp. 14–16).

[200] Cf. Markus (2004, p. 16).

[201] Cf. Martin (2018, p. 12); Bouée (2015); Westerman et al. (2011, pp. 50–52); Mohr (2020, pp. 142–143).

[202] Cf. Lauer (2021, p. 145).

[203] Cf. Lauer (2021, pp. 146–147).

implemented faster and more efficiently. Thus, internally driven developments and changes reach their goal more efficiently and effectively.[204]

The engagement of the affected business units and employees was confirmed within five publications analyzed[205] and six interviews. Transformation initiatives should actively involve the business units to receive their feedback and input to jointly develop business and customer-oriented solutions. In addition, employees should be provided with the opportunity to experiment with new ideas and technologies, to drive change in their working environment, and to participate in decision-making and strategy development processes.[206] Two interviewees highlighted the importance of the implementation of interdisciplinary teams for digital transformation initiatives. Employees from the business units affected by the digital transformation initiative and other units, such as IT, are working together to combine their knowledge and to drive success together.

The chief digital officer of the German Ergo Group has stated in this context "I think the end goal is that everybody in the company is a CDO. As soon as everybody is acknowledging the value of digital transformation, embracing it, and making it happen, I'm not needed anymore."[207]

Implementation of agile (project) management methodologies

Project management is defined as the professional, structured, and planned organization of project preparation, project implementation, and project monitoring. The management of a digital transformation and project management are inextricably linked areas because digital transformation is usually organized in the form of projects or initiatives.[208] This connection was confirmed by seven interviews. These interviewees specifically pointed out the importance of implementing agile project management methods for a successful digital transformation.

In the context of digital transformation, more and more companies are striving to become agile and to use agile (project) methods. Agile project management originates from software development. It is the 'lightweight' reaction to the process- and document-heavy traditional methods and their difficulties in dealing with rapidly changing requirements.[209] The goal of companies applying agile

[204] Cf. Lauer (2021, pp. 146–147).

[205] Cf. Martin (2018, p. 12); Bouée (2015); Reinhardt (2020, pp. 79–80); Westerman et al. (2011, pp. 50–52); Mohr (2020, pp. 142–143).

[206] Cf. Martin (2018, p. 12); Burkacky et al. (2018, pp. 8–9); Bouée (2015); Reinhardt (2020, p. 79); Mohr (2020, pp. 142–143).

[207] Obwegeser et al. (2020).

[208] Cf. Lauer (2021, p. 186).

[209] Cf. Hess (2019, p. 109).

methods is to increase agility and improve organizational ability to identify opportunities and risks and to exploit them rapidly, flexibly, and effectively.[210] Agile methods are implemented to provide innovative, digital products, and services faster, in a more customer-centric and adaptive manner. Among the best-known methods are 'Scrum'[211] and 'Kanban'[212]. Agile methods share a mindset that represents essential values such as openness to change, transparent communication, the will to learn continuously, self-organization, and taking responsibility for products and processes.[213] These values are also particularly important for a corporate culture in the context of digital transformation, as described in section 5.4.2. Thus, the agile methods drive a targeted change to the organization and ways of working.[214]

The interviewees follow this conviction and regard it as critical to success that agile (project) management methods are applied. The iterative approach with retrospective and planning meetings, in which current progress, next steps and lessons learned are be discussed, is considered particularly valuable by the interviewees. Classic management methods are considered too rigid and not flexible enough to be able to react appropriately to the constantly changing environmental conditions.

However, it was highlighted that agile methods are not necessarily effective and efficient in every transformation for every area and activity. For example, the application of agile methods is typically not profitable for routine tasks with clear targets, tangible results, and workflows. The iterative and trial-and-error approach does not fit to the clearly defined specifications and the corresponding formalized processes.[215] Therefore, it is recommended to specifically evaluate

[210] Cf. Denning (2018); Fuchs et al. (2019, p. 197).

[211] Scrum is a framework for agile product development and project management. Despite its origins in software development, it is increasingly being applied to non-software projects. It is a framework based on the definition of roles, artifacts, and events as well as the interaction of these three elements. It is an incremental, iterative approach that runs in short development loops. Therein, Scrum is not a rigid process specification, but provides the framework and rules in which the concrete working methods can be defined by the users of Scrum themselves. (Cf. Schwaber and Sutherland (2020))

[212] Kanban is about transparently displaying the current workflow, the 'work in progress' and the existing difficulties or bottlenecks. For this, Kanban boards, sticky notes, or also digital boards are used. On the boards, the work is organized and regulated in the columns 'to do', 'doing', and 'done'. One task is represented on one card that moves from left to right on the board. In the upstream backlog (= unsorted topic memory), the tasks are collected, broken down, and formulated into individual cards. (Cf. Schnell and Schnell (2019, p. 80))

[213] Cf. Fuchs et al. (2019, p. 197).

[214] Cf. Fuchs et al. (2019, p. 197).

[215] Cf. Fuchs et al. (2019, 201).

when agile methods are to be implemented. For this purpose, Fuchs et al. propose a combination of the 'Stacey Matrix'[216] and the 'Cynefin Framework'[217] as a tool for evaluation. The tool, illustrated in figure 5.3, assess whether the use of agile methods is beneficial based on two dimensions—the goal (what is to be achieved) and the path (how is the goal to be achieved). In complex situations, in which tasks and activities with unclear objectives are present, agile methods are recommended, requiring innovative solutions, and an experimental and adaptive approach.

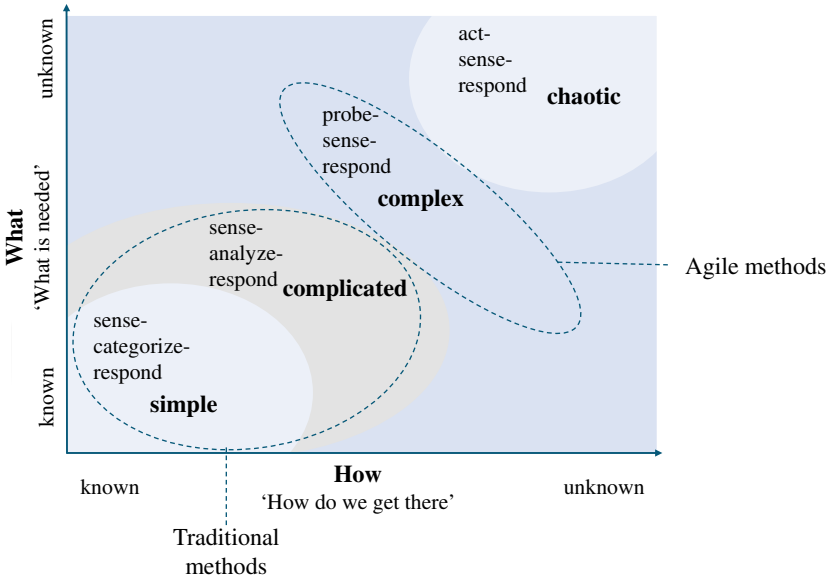

Figure 5.3 Tool for the evaluation of agile methods. (Source: Fuchs et al. (2019, p. 204); Stacey (2012); Snowden and Boone (2007))

[216] The Stacey matrix can be applied to analyze and classify problems. It distinguishes between simple, complicated, complex, and chaotic problems (Cf. Stacey (2012)).

[217] The Cynefin Framework distinguishes between five decision-making contexts (obvious, complicated, complex, chaotic, disordered) and suggests appropriate solution strategies to the problem contexts (Cf. Snowden and Boone (2007)).

5.9 Focus Area: Digital Platform

5.9.1 Concept and Contribution to Success

The foundation of a company's digital transformation builds its digital platform, consisting of the technologies, applications, and data, enabling a company's business processes. According to Bonnet and Westermann a digital platform consists of the following three interrelated but distinct elements:

- *A core platform* builds the foundation for operational and transactional systems like back-office systems, or systems of record, enabling a company's key processes. It is a company's technology backbone.[218]
- *An agile externally facing platform* powers a company's websites, apps, and processes, connecting it with customers and partners. This platform works with the core platform, performing key transactions and building the basis for conducting customer experiments and delivering personalized experiences.[219]
- *A data platform* enables a company to perform intense analytics, build and test algorithms, without interfering a company's operational systems.[220]

Digital platforms themselves no longer represent a direct competitive advantage, rather they are the foundation of a company's business activities. In 2019, Accenture surveyed more than 6,600 business and IT executives for its report 'The Post Digital Era Is upon Us'[221]. Nearly 80% of the respondents indicated that SMAC technologies have already become part of the technology foundation of their organization.[222] Critical to the success of a digital transformation is how companies build upon the SMAC foundations and how new generations of technologies and innovations are deployed, how they are used to transform processes and ways of working, as well as how they are used to generate new value for customers.[223]

[218] Cf. Bonnet and Westerman (2020).
[219] Cf. Bonnet and Westerman (2020).
[220] Cf. Bonnet and Westerman (2020).
[221] Cf. Accenture (2019).
[222] Cf. Accenture (2019).
[223] Cf. Kane et al. (2015, p. 5); Accenture (2019, p. 11).

The technologies, applications, and data of the digital platform should be determined once the goals of the company and its transformation have been specified. They should be properly selected to provide the foundation of the digital transformation and the necessary changes. Thus, the desired future of the company should determine the digital platform to be used and not vice versa.[224]

5.9.2 Success Factors

Establishing a digital platform

Companies are recommended to invest in a digital platform that is designed around business priorities and aligned with the overall business goals.[225] A research, conducted by the Boston Consulting Group recommends that the design of the platform integrates products and process simplification and optimization, as well as organizational changes. Moreover, the implementation should be carried out based on best practices for modularity, flexibility, and scalability. Companies need to ensure that their digital platform supports integration with external ecosystems, that modern tools and platforms are integrated, and that the benefits of commercial off-the-shelf solutions are always balanced against personalized solutions.[226]

The digital platform should not only enable business processes, but also ensure data availability and data quality for data-based decision making and the derivation of actionable insights from relevant customer data.[227] According to Martin, adopting the digital platform to make information more accessible across the organization more than doubles the likelihood of a successful transformation.[228] This success factor was only specifically identified in two of the publications analyzed.[229] One explanation for this could be that the literature analyzed follows the conviction that digital technologies and applications create a basis for digital transformation but are not a guarantee of success.[230]

[224] Cf. Tabrizi et al. (2019).

[225] Cf. Forth et al. (2020, pp. 23–24).

[226] Cf. Forth et al. (2020, pp. 23–24).

[227] Cf. Marckstadt et al. (2020, p. 15); Forth et al. (2020, p. 15); Martin (2018, p. 10).

[228] Cf. Martin (2018, p. 10).

[229] Cf. Forth et al. (2020, pp. 20–23); Martin (2018, p. 12).

[230] Cf. For example Bouée (2015).

Implementation of technologies, supporting the management of the digital transformation

In six interviews and in one publication[231], the implementation of technologies, supporting the management of a digital transformation was identified as a success factor. This includes technologies that enable the coordination, monitoring, and control of the entire transformation as well as individual initiatives, such as traditional project management tools, collaboration platforms, or agile planning tools. The focus of these technologies is the enhancement of the collaboration of people and teams, not their replacement.[232]

Implementation of technologies, supporting the development of targeted capabilities

The 'Implementation of technologies, supporting the development of targeted capabilities' was identified as success-critical in two publications analyzed[233] and five interviews. This includes technologies that contribute to a company's flexibility and responsiveness, automate business processes and make them more intelligent, as well as technologies, enabling the analysis of customer data for actionable customer insights.[234] Two exemplary technologies in this context are advanced analytics and intelligent process automation:

- *Advanced analytics:* Using tools to discover deep insights, make predictions, or generate recommendations by autonomous or semi-autonomous processing of data or content to provide intelligence, to improve decision making, and to enhance processes. Advanced analytics include sophisticated techniques and tools that typically go beyond those of traditional business intelligence, like data/ text mining, forecasting, simulation, and neural networks.[235]
- *Intelligent process automation (IPA):* Using a set of technologies that combines fundamental process redesign with robotic process automation (RPA) and artificial intelligence (AI) to remove repetitive, replicable, and routine tasks. IPA can increase efficiency, improve employee performance, reduce operational risks, and improve response times and customer experience. IPA can not only replace human labor in processes that involve aggregating data from multiple systems or taking information from a written document and capturing it as standardized data input, but it can also perform higher-level

[231] Cf. Bürkner et al. (2016, p. 19).

[232] Cf. Project Management Institute, Inc. (PMI) (2018); Bürkner et al. (2016, p. 15).

[233] Cf. Martin (2018, p. 12); Marckstadt et al. (2020, p. 15).

[234] Cf. Marckstadt et al. (2020, p. 15).

[235] Cf. Bollard et al. (2017, p. 3); Gartner, Inc.

> tasks. These cover intelligent workflows where the status of end-to-end processes can be tracked in real time, subtask handoffs can be managed, and data can be made available, or machine learning, to autonomously recognize patterns and relationships based on data and make predictions, or cognitive agents which combine machine learning and natural language processing to develop a virtual workforce that can perform even sophisticated tasks,[236]

Moreover, Martin considers the implementation of digital self-serve technologies for employees and business partners to be critical to success. According to his study, these make digital transformation' success twice as likely.[237]

Implementation of technologies, enabling communication and collaboration
In section 5.3 the extraordinary role of communication for the success of a digital transformation is described. With the fast-evolving communication technologies, the boundaries between personal and medial communication are becoming increasingly blurred.[238] Video chats enable an almost personal exchange regardless of the physical space of the conversation partners. Employees from around the world can meet and work together via video chat and share relevant information.[239] Five interviewees referenced this, highlighting that implementing technologies, enabling communication and collaboration regardless of physical space, is critical to success.

5.10 Focus Area: Partnership Network

5.10.1 Concept and Contribution to Success

To accelerate a digital transformation, building an ecosystem of partners with facilitating assets is one decisive success factor.[240] A digitally connected ecosystem is a coordinated network of enterprises, devices, and customers, creating value for all of the participants.[241] Digital transformation requires companies to collaborate in new ways with players outside their own organization. The offered

[236] Cf. Bollard et al. (2017, pp. 3–4); Berruti et al. (2017, p. 2).
[237] Cf. Martin (2018, p. 10).
[238] Cf. Lauer (2021, p. 121).
[239] Cf. Rump and Eilers (2017a, pp. 5–6); Foerster-Metz et al. (2018, p. 9).
[240] Cf. Fenwick (2019); Schroeck et al. (2020); Westerman et al. (2011, p. 49).
[241] Cf. Weill and Woerner (2015).

products, services, and value propositions of a company will increasingly depend on its ability to attract the right partners and to become part of a digitally connected ecosystem.[242] New partnership networks enable a company to combine different expertise and deliver new operating models.[243] Herby, it is important to actively seek new opportunities to work in a partnership with other organizations.[244] To attract partners, it is essential to provide differentiated value, in the form of e.g. a trusted brand, compelling offerings, or a superlative customer experience.[245] To connect with new partners, an open platform is recommended, that allows to share capabilities quickly and to scale the partnership.[246]

A publication from Deloitte suggests four partner archetypes, shown in figure 5.4 that characterizes partners by the type and way they add value and

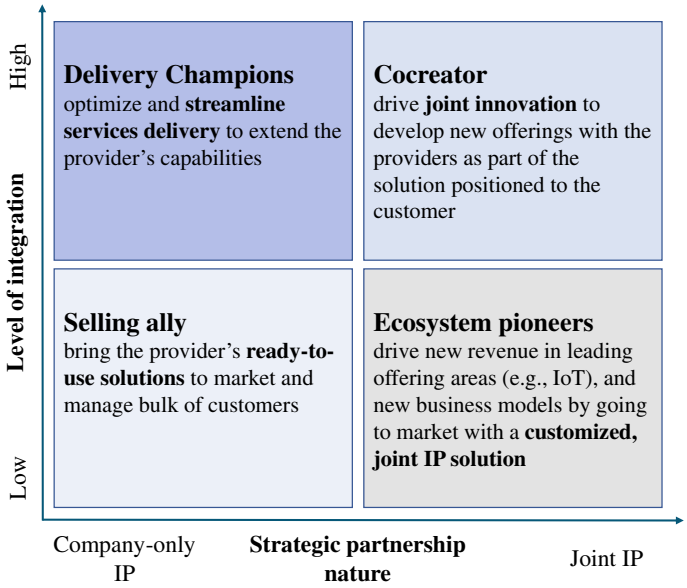

Figure 5.4 Partner archetypes. (Source: Based on Schroeck et al. (2020, p. 4))

[242] Cf. Burkacky et al. (2018); Weill and Woerner (2015).
[243] Cf. Westerman et al. (2011, p. 49).
[244] Cf. Kane et al. (2015, p. 13).
[245] Cf. Sebastian et al. (2020).
[246] Cf. Sebastian et al. (2020).

collaborate with a company. This approach is based on the level of integration and the strategic nature of the partnership.

- *'Selling allies'* bring the provider's solutions to market and manage the customers as an extension of the sales team in order to expand customer reach and to lower costs of sales.[247]
- *'Delivery champions'* optimize and streamline service delivery to expand and scale the capabilities of the provider, supporting the provider to reduce costs, build skills, and to develop extended offerings.[248]
- *'Ecosystem pioneers'* drive new revenue in leading offering areas and new business models, by going to market with a customized, shared intellectual property (IP) solution. This approach enables companies to extend their value proposition beyond existing solutions by integrating partners' solutions.[249]
- *'Cocreators'* drive collaborative innovation in order to develop and deliver customer-centric, differentiated, and specialized offerings, addressing customers' changing needs. Herby, both partners combine their unique intellectual properties, capabilities, and product or service expertise.[250]

5.10.2 Success Factors

In total three clusters were derived from the analyzed literature and the conducted interviews for the success-critical focus area of partnership network. In the following, each identified success factor cluster is described in detail.

Collaboration, communication, and exchange of information
Four interviewees consider a regular exchange of information and communication as the basis for any partnership. It is essential for the cooperation that progresses and obstacles are communicated, and that know-how is transferred. Specific guidelines on communication, collaboration, and the exchange of information need to be determined and should be embedded in the governance.[251]

[247] Cf. Schroeck et al. (2020, p. 4).
[248] Cf. Schroeck et al. (2020, p. 5).
[249] Cf. Schroeck et al. (2020, p. 5).
[250] Cf. Schroeck et al. (2020, p. 6).
[251] Cf. Sebastian et al. (2020).

Definition of common goals and strategies

Four interviewees consider it critical to success that the partners define and pursue common goals and strategies, serving as a foundation for joint value creation. It needs to be ensured that the value for both partners is determined and that a mutually beneficial relationship is established. The value can be created in addition to revenue, customer retention, engagement and visibility by better meeting the customer demands and needs.[252] The partnership should be exemplified by the higher management levels to increase acceptance among the workforce. Thus, it is important that the leadership of the partners communicates the common goals and strategies and promotes them within their organizations.

Build trust and a sense of community

Three interviewees consider trust as the foundation for any successful partnership. Trust is the "social glue"[253] that holds partnerships together and enables business partners to spend less time and energy protecting themselves from exploitation and more time focusing on the actual goals of the partnership.[254] Moreover, the partners need to foster a sense of community within the organizations. Teams, consisting of employees from the various partners, must overcome competitive thinking and resentment; they must treat each other with respect and meet as equals.

[252] Cf. Sebastian et al. (2020).

[253] Brett and Mitchell (2020).

[254] Cf. Brett and Mitchell (2020).

Criteria Catalog for a Successful Digital Transformation

6

In the previous chapter, ten focus areas and relevant success-critical factors of a digital transformation are presented. Building on this information, this chapter introduces a criteria catalog for the successful management of a digital transformation. It is intended to serve as an evaluation basis for the management models of a digital transformation, which are discussed in chapter 7.

The criteria catalog is divided into ten categories in accordance with the ten success-critical focus areas of a digital transformation. The respective categories are subdivided into further thematic dimensions, based on the success factor clusters.

For each thematic dimension, an evaluation level of the object to be examined is to be determined based on its characteristics and attributes. The evaluation levels are discrete and build on each other. A distinction is made between three levels:

- *Level 0:* The thematic dimension is not addressed in the management model.
- *Level 1:* The thematic dimension is addressed in the management model, but no specific measures for implementation are defined.
- *Level 2:* The thematic dimension is addressed in the management model and specific measures for implementation are defined.

The three levels only indicate whether certain success factors are considered and implemented within a management model, but not whether proposed measures are qualitatively valuable and purposeful. Moreover, there is no differentiation made

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based on the importance of the various categories and thematic dimensions for the success of a digital transformation. Thus, no weighting is applied. For future research, it its recommended that studies are conducted based on quantitative or qualitative surveys. In this way, the thematic dimensions could be reflected according to their influence on the success of a digital trans-formation, which would allow the calculation of an overall score.

Figure 6.1 shows an excerpt of the criteria catalog for a successful digital transformation of the 'Leadership' category. It is intended to illustrate the approach for creating the criteria catalog. Within a focus area, a thematic dimension was derived for each success factor cluster for which the evaluation level is to be determined. The complete criteria catalog can be found in Appendix F in the electronic supplementary material[1].

No.	Criteria	Evaluation scale Level (0/1/2)
	Leadership	
1	A person or group is in charge of managing the digital transformation.	
2	The definition and communication of the vision, goals, and strategies are considered as a leadership task.	
3	Not only the top management level is involved in the management of digital transformation, but also all other management levels.	
4	The leadership has the knowledge, skills, and behaviors required for digital transformation.	
a	The focus is particularly placed on digital skills and openness towards change and new perspectives.	
5	Leadership is supported in developing the required knowledge, skills, and behaviors.	
6	The leadership empowers its employees and actively involves them in the digital transformation.	

Figure 6.1 Excerpt from the criteria catalog for a successful digital transformation. (Source: Own illustration.)

[1] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_6).

7 Analysis of Management Models of Digital Transformation

Digital transformation requires a systematic approach that goes beyond individual transformation initiatives and shows how a digital transformation can be managed successfully. There are already a variety of approaches that claim to provide guidance and orientation to the management of a digital transformation. The following chapter presents an overview of the already existing approaches. Then, two models are selected that are best suited to contribute to the implementation of the ten success-critical focus areas of a digital transformation. Subsequently, these two models are analyzed and evaluated in detail, by applying the criteria catalog, outlined in chapter 6.

7.1 Overview of Existing Management Models

Various management consultancies as well as scientific and academic institutions have developed and published approaches of digital transformation management, ranging from models and frameworks over stages and journeys to fields of actions and principles.[1] These approaches are intended to provide a systematic guideline on how companies can successfully manage a digital transformation. This chapter aims to provide an overview of these approaches, following a three-step process, that consists of 'Preliminary review of the researched models', 'Pre-selection

[1] In the following, these different approaches to managing a digital transformation are referred to as 'models' for simplification.

Supplementary Information The online version contains supplementary material available at (https://doi.org/10.1007/978-3-658-36158-7_7).

K. Wenzel, *Management Models of Digital Transformation*, BestMasters,
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of relevant models for a preliminary analysis', and 'Preliminary analysis of the pre-selected models'.

1. Preliminary review of the researched models

As the result of a literature and internet research, 16 models were identified that aim to pursue an holistic approach to the management of digital transformation.[2] The models are published by academic and scientific institutions, renowned business schools, and consulting companies and provide a broad overview of existing approaches to managing a digital transformation.

In order to be able to review and compare the models, a one-pager was compiled for each management model. An exemplary one-pager is shown in figure 7.1.[3]

The one-pager lists the model's title, author(s) and publisher(s), and the year of publication as general information. In addition, each model is analyzed based on the three characteristics of models which are described in detail in chapter 3.3:

- *Mapping:* What part of reality does the model describe?
- *Reduction:* On which attributes of the archetype does the model focus?
- *Pragmatism:* Who are the addressees of the model? For which time interval is the model created? What is the specific purpose of the model?

During the preliminary review of the management models, differences as well as similarities could be observed. The models reviewed are primarily addressed to the management level of companies in charge of or interested in digital transformations. In addition, they provide an informative framework for companies, consultants, and those with individual interest in the management of a digital transformation. Even if the models do not use the same wording in formulating their purpose, and even if the purposes are not congruent in detail, they are all intended to provide guidance to companies, and specifically to their management, on how to successfully master and benefit from digital transformation. They offer a common language and a method-based approach, making the digital transformation comprehensible and manageable.

The reviewed management models can be differentiated into three distinct categories based on the 'part of reality' that they are representing and the attributes they

[2] See appendix H in the electronic supplementary material for an overview of the reviewed management models of digital transformation (https://doi.org/10.1007/978-3-658-36158-7_7).

[3] Additional exemplary one-pagers can be found in appendix G in the electronic supplementary material (https://doi.org/10.1007/978-3-658-36158-7_7).

The six elements of a successful digital transformation

Author:	Burkacky, Ondrej et al.
Publisher:	McKinsey and Company
Year:	2018
Title:	"A blueprint for successful digital transformations for automotive suppliers"

Mapping: What part of reality does the model describe?

The model represents elements of digital transformations of automotive suppliers

Reduction: On which attributes of the archetype does the model focus?

- Six key elements of a successful digital transformation with detailed descriptions and recommendations for action → Digital strategy and targets, Org structure, Test-and-learn-approach, Talent and capabilities, Ecosystem leverage, Culture change

Pragmatism:

Who are the addressees of the model?

- Leaders in the automotive-supply sector

For which time interval is the model created?

- The model does not give specific information about the time interval for which it can be used. However, the period of a company's digital transformation can be considered as the underlying time interval.

What is the specific purpose of the model?

- Help automotive suppliers to successfully design and soundly execute their digital transformation

Model illustration (if available):

Source: Burkacky et al. (2018), p. 2

Figure 7.1 Exemplary one-pager: management model of a digital transformation. *(Source: Own illustration.)*

are focusing on. The categories and their assigned symbol are shown and defined in figure 7.2.

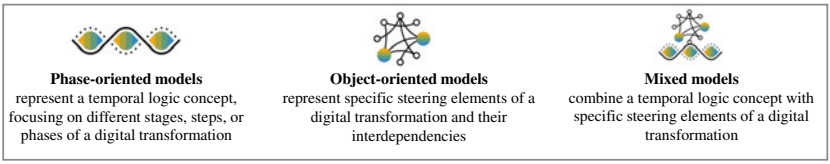

Figure 7.2 Different categories of management models of digital transformation. (Source: Own illustration.)

In total, five of the 16 models are classified as phase-oriented models. These models represent a temporal logical concept of digital transformation, focusing on the various stages, steps or phases into which a digital transformation can be divided. The models attempt to systematize and structure the fulfillment of the overall tasks and activities in a temporal-logic process. One example of phase-oriented models is the 'Digital Transformation Journey', published by the Boston Consulting Group. It structures a digital transformation into a four-step process with detailed descriptions and recommendations for action. The model suggests the following structure: The first step is to "educate yourself on the landscape"[4], then companies need to "crystallize a plan for how to move forward"[5], the third step is to "accelerate successful initiatives"[6] and the last step of a digital transformation is to "scale up and transform the entire organization"[7].

Object-oriented models, on the other hand, do not focus on a temporal-logic sequence, but are intended to structure the digital transformation into its specific steering elements and their interdependencies. In total, seven of the 16 models are classified as object-oriented models. An example of an object-oriented model is the 'Digital Lean Transformation Framework' by Romero et al.[8] This model includes five management pillars with detailed descriptions, lean practices and tools, as well as recommendations for action. The five elements, represented in this model, are

[4] Bürkner et al. (2016, p. 117).
[5] Bürkner et al. (2016, p. 117).
[6] Bürkner et al. (2016, p. 117).
[7] Bürkner et al. (2016, p. 117).
[8] Cf. Romero et al. (2019).

‘(digital) strategic management’, ‘process (re-)engineering management’, ‘(digital) technology management’, ‘change (people) management’, and ‘(digital) risk management’.[9]

Four models were categorized as mixed models, combining a temporal-logic concept with specific steering elements of a digital transformation. An example of a mixed model is the ‘Dortmunder Management Modell’ by Henke et al.[10] The model is based on three accelerating factors of a digital transformation ’change management, ’migration’, and ’transformation’. In addition, the framework developed for the Dortmund Management Model structures the transformation process in two dimensions: a management dimension that describes the relevant tasks of management (goal, planning, decision, realization, and monitoring), representing the temporal logic concept of a digital transformation, and an organizational design dimension in the form of four pillars ’technology’, ’people’, ’organization’, and ’information’, representing specific steering elements of a digital transformation.[11]

2. Pre-selection of relevant models for a preliminary analysis

In the next step, relevant models of the 16 models reviewed were selected based on the literature types and their categories to serve as the basis for the preliminary analysis.

First, management models published by academic and scientific institutions were selected, assuming to be developed both scientifically and methodologically well-founded and thus meeting particular high-quality standards.

Second, in chapter 3.1, it is described that, from a system-oriented perspective, a company is a complex system defined by the sum of a multitude of elements. These elements are subject to an order which describes the type and number as well as their arrangement and interdependencies. This order is subject to ongoing dynamics that cannot be fully anticipated. As a result, management activities must always be considered in a multifaceted context and as interdependent interactions of various steering elements. Therefore, the focus in the following will be on the object-oriented models as well as the mixed models, describing the specific steering elements and their interdependencies in the context of a digital transformation.

3. Preliminary analysis of the pre-selected models

In the third step, the preselected management models were analyzed based on the ten success-critical focus areas of a digital transformation, that are defined in chapter 5.

[9] Cf. Romero et al. (2019).

[10] Cf. Henke et al. (2020).

[11] Cf. Henke et al. (2020, pp. 561–563).

Each management model was evaluated per focus area, applying the development levels, described in chapter 6:

- *Level 0:* The success-critical focus area is not addressed in the management model.
- *Level 1:* The success-critical focus area is addressed in the management model, but no specific measures for implementation are defined.
- *Level 2:* The success-critical focus area is addressed in the management model and specific measures for implementation are defined.

The analysis revealed two models that are best suited to contribute to the implementation of the ten success-critical focus areas of a digital transformation—'The digital transformation framework' by Westerman et al. (2011) and the 'Digital transformation management framework' by Hess (2019).[12] These two models are analyzed and evaluated in detail in chapter 7.2.

7.2 Analysis of Selected Management Models of Digital Transformation

In the following chapter, the 'Digital transformation framework' by Westerman et al. (2011) and the 'Digital transformation management framework' by Hess (2019) are analyzed in detail, based on the criteria catalog that is presented in chapter 6. To this end, the models and their structure are first described and then the results of the detailed analysis are presented.

7.2.1 The 'Digital Transformation Framework'

General description of the model

The 'Digital transformation framework' is part of the publication 'Digital Transformation: A roadmap for billion-dollar organizations' which was written by Westerman et al. and published in 2011 by Capgemini Consulting and the MIT Sloan Management. The model represents both, a temporal-logic concept of a digital

[12] The detailed results of the preliminary analysis of the preselected management models can be retrieved from Appendix I in the electronic supplementary material (https://doi.org/10.1007/978-3-658-36158-7_7).

transformation and its relevant steering elements. It is addressed to senior executives and is based on an iterative three step process that leaders should follow to steer their organization during a digital transformation. Leaders should begin with envisioning the digital future of their company, then they should invest in digital initiatives and skills. In the third step they should lead the change from the top. In each step specific elements of the model are addressed, shown in figure 7.3. The model is composed of six key elements, divided into the 'how' and the 'what'.[13]

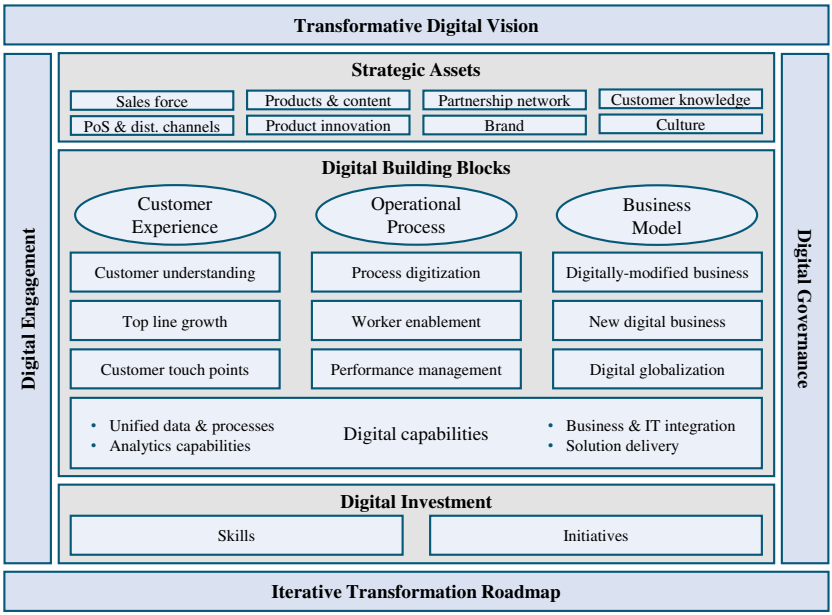

Figure 7.3 The digital transformation framework by Westerman et al. (2011). (Source: Based on Westerman et al. (2011, p. 47))

The 'what' represents the inner boxes of the 'Digital transformation framework', consisting of 'Strategic Assets', the nine 'Digital Building Blocks', the 'Digital Capabilities' and the 'Digital Investments'. They are described as the "specific set

[13] Cf. Westerman et al. (2011).

of elements implemented by the organization, and the resources used to do so"[14], representing the "digital intensity of the organization"[15].

The 'How' represents the outer boxes of the 'Digital transformation framework', consisting of the elements 'Transformative Digital Vision', 'Digital Governance', 'Digital Engagement' and an 'Iterative Transformation Roadmap'. These elements describe the ways in which leaders drive the transformation to a successful outcome, representing the "transformation management intensity of the organization"[16]. They guide leaders to ensure that the elements of the 'what' are built effectively, and that the organization has the skills and culture to drive value from them.[17]

Together, all elements of the 'Digital transformation framework' represent the digital maturity of an organization. Companies are recommended to be mature in both dimensions, the 'how' and the 'what', to drive a successful and sustainable digital transformation. This will enable them to generate business value from the transformation.[18]

Analysis of the 'Digital transformation framework'

In the following the summarized results of the detailed analysis of the 'Digital transformation framework' by Westerman et al. (2011) are presented. The detailed analysis with specific references to the corresponding passages and pages of the management framework can be found in Appendix J.1 in the electronic supplementary material[19]. In the initial analysis of the 'Digital Transformation Framework', it becomes apparent that there are numerous commonalities between the success-critical focus areas, defined in chapter 5 and the elements of the model analyzed. In fact, all of the success-critical focus areas are at least addressed in the model, as shown in figure 7.4.

However, a more detailed analysis reveals that not all criteria are met as several thematic dimensions of the success-critical focus areas are not addressed or are addressed without suggesting specific implementation measures. Likewise, it becomes apparent that, with exception of the digital capabilities, the 'Digital Building Blocks' are not covered by the ten success-critical focus areas. This is because

[14] Westerman et al. (2011, p. 59).

[15] Westerman et al. (2011, p. 59).

[16] Westerman et al. (2011, pp. 59–60).

[17] Cf. Westerman et al. (2011, pp. 59–60).

[18] Cf. Westerman et al. (2011, p. 60).

[19] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_7).

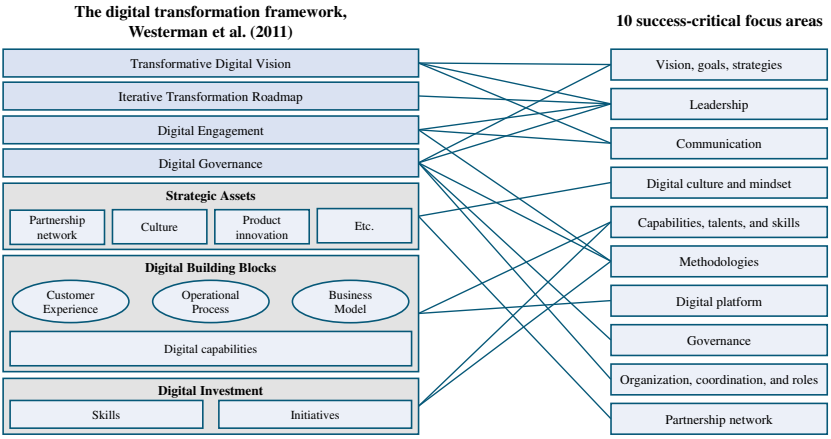

Figure 7.4 Analysis of the 'Digital transformation framework' by Westerman et al. (2011). (Source: Own illustration.)

they focus exclusively on the actual management of the digital transformation and not on specific components, such as business processes, products, and services, which should be digitalized in the course of a digital transformation. This distinction will be addressed as an important aspect within the framework for a management model in chapter 8.

When analyzing the model based on the 'Leadership' assessment category, it was first observed that the leadership of a digital transformation is considered within several elements of the model—the 'Transformative digital vision', Digital engagement', 'Digital governance', and 'Iterative transformation roadmap'. These elements represent the way in which leaders drive the transformation to a successful outcome, the 'how' of the model previously described. The model illustrates in detail what tasks and responsibilities the leadership should have but neglects the targeted competencies and skills of the leadership of a digital transformation and their development.

The 'Vision, goals, and strategies' focus area can be directly linked to the element 'Transformative digital vision', and indirectly to the 'Digital Governance' of the 'Digital transformation framework'. The model focuses on and describes in detail how a transformative digital vision can be developed, how a roadmap can be built, connecting to the broader vision, and how the vision can be translated into a set of ambitions and targets.

Communication is integrated into two elements of the 'Digital Transformation Framework'. The model recognizes the role of communication as paramount in effecting change and reducing organizational resistance. Herby, the model highlights the importance of the early and consistent communication of the transformative digital vision and describes specific recommendations of action to engage employees in digital transformation. Thus, communication is included in the elements 'Transformative digital vision' and 'Digital engagement'. However, no additional content and details are described that should be considered when communicating in the course of digital transformation.

The 'Digital Transformation Framework' considers a digital culture as one strategic asset of a company to be targeted in a digitally transformed company. The importance of culture is described in the context of practical case examples. However, the framework does not describe precise values and characteristics that a targeted culture should promote, nor does it propose concrete measures for how culture can be changed.

The 'Capabilities, talents, and skills' focus area is discussed within several elements of the 'Digital transformation framework'. A company's capabilities are considered as the fundamental building block for transformations in the area of customer experience, operational processes, and business models. The talents and skills are considered as a 'Digital Investment'. While the definition of targeted capabilities is described in detail, the model focuses on understanding investment needs, risk management, and the changes needed to activate them, rather than specific talents and skills that organizations should develop.

The 'Digital transformation framework' addresses methodologies to identify, test, and implement new ideas, ways of working, and technologies in the element of 'Digital Investments'. Methodologies to review and monitor the progress of the digital transformation are incorporated in the element 'Digital Governance', and methodologies to empower and engage the organization are incorporated in the element 'Digital Engagement'. Specific methodologies like change management or project management are neglected.

The 'Digital transformation framework' addresses the digital platform as a solid foundation for digital initiatives, consisting of technology-enabled processes, data, analytics, solution delivery, and relationship capabilities that can be extended as needed. Thus, information technologies represent a fundamental component of an organization's digital capabilities. The model focuses on issues with information technology infrastructures and capabilities that companies are facing, when undergoing a digital transformation. It does not suggest specific solutions for the implementation of a suitable digital platform, supporting the management of a digital transformation.

The element 'Governance' of the 'Digital transformation framework' incorporates the topics of top-down ambition setting, coordinating mechanisms to turn disconnected or poorly considered digital investments into true platforms for transformation, and monitoring through KPIs to ensure that progress is being measured and managed. These sub-areas were not assigned to the success-critical focus area 'Governance' within chapter 5 of this work. Rather these topics were assigned to different focus areas: The topic of ambition setting is assigned to the focus area 'Vision, goals, and strategies', the coordination mechanisms to the focus area 'Organization, coordination, and roles', and the topic of monitoring through KPIs to the focus area 'Methodologies'.

The focus area 'Organization, coordination, and roles' is integrated into the 'Digital Governance' element of the 'Digital transformation framework'. The model proposes concrete approaches on how digital transformation and digital transformation initiatives can be coordinated and integrated into the corporate organization. The model does not address explicitly the fact that roles must be revised and, if necessary, redefined, neither it describes any specific roles that are particularly important for a digital transformation.

The 'Digital transformation framework' considers the 'Partnership network' as a part of the element 'Strategic assets', which can be developed to become an important lever for the success of a digital transformation. The model highlights the importance of a partnership network but does not present any recommendations for action on how to establish such a network.

Although the 'Digital transformation framework' by Westerman et al. offers a comprehensive design framework of digital transformation and clarifies overall interrelations, management as an integrated cross-functional component is not operationalized in all the individual elements to such an extent that concrete recommendations for action can be derived for the digital transformation of companies across all elements.

7.2.2 The 'Digital Transformation Management Framework'

General description of the model

The 'Digital transformation management framework' has been developed in collaboration between science and practice in recent years by Hess and Barthel (2017) and further developed by Hess (2019).[20] This model considers digital transformation from a holistic perspective and puts digital innovations at its center. It is intended as a

[20] Cf. Hess and Barthel (2017); Hess (2019, p. 6).

blueprint that structures the tasks associated with managing a digital transformation and is addressed to executives and digitalization experts who want to approach digital transformation systematically and with a scientifically validated background. The model incorporates three central topics, that are shown in figure 7.5—'Developing a transformation strategy', Changing the value creation processes', and 'Creating the concrete prerequisites for the digital transformation'.[21]

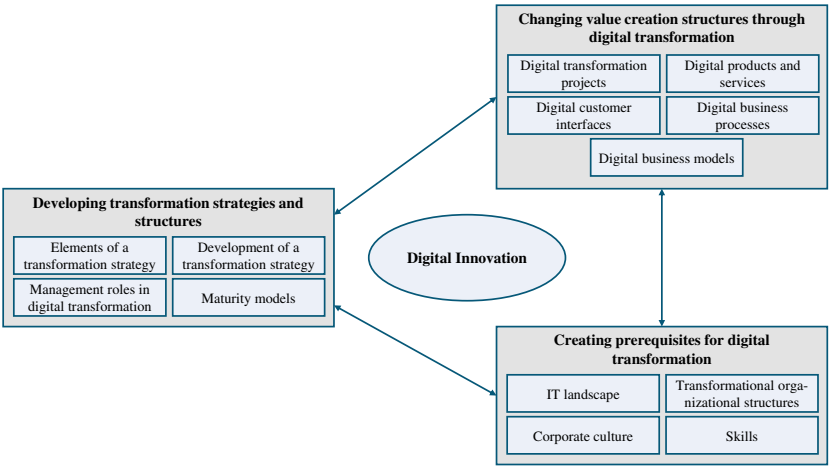

Figure 7.5 The digital transformation management framework by Hess (2019). (Source: Based on Hess (2019))

The first element 'Developing transformation strategies and structures' deals with the transformation strategy as a guard rail for digital transformation. It addresses relevant content elements of the strategy, how they are developed, and how they are communicated once they have been established. Moreover, it addresses the definition of management roles that drive, steer, and implement the digital transformation.[22]

The second element 'Changing value creation structures through digital transformation' addresses the changes to products and services, customer interfaces, business processes, and business models enabled by digitalization projects. For

[21] The model is originally published in German and has been translated into English for this work.

[22] Cf. Hess (2019, pp. 8–10).

each topic, specific process models, tools, and concepts are suggested on how these can be implemented and optimized in the course of a digital transformation.[23]

The third element 'Creating the prerequisites for digital transformation', emphasizes that digital transformations can only succeed if the necessary prerequisites are created with foresight. These include the IT landscape, the workforce, the structures that promote innovation, and the corporate culture.[24]

Analysis of the 'Digital transformation management framework'

In the following the summarized results of the detailed analysis of the 'Digital transformation management framework' by Hess (2019) are presented. The detailed analysis with specific references to the corresponding passages and pages of the management framework can be found in Appendix J.2 in the electronic supplementary material[25]. As in the analysis of the 'Digital transformation framework' by Westerman et al., it becomes apparent that there are numerous commonalities between the success-critical focus areas, defined in chapter 5, and the elements of the 'Digital transformation framework' by Hess. As shown in figure 7.6, all success-critical focus areas are at least addressed in the model.

However, the analysis also shows that not all criteria are met, as several thematic dimensions of the success-critical focus areas are not addressed or are addressed without suggesting specific implementation measures. Like in the analysis of the 'Digital transformation framework' by Westerman et al., it becomes apparent that, with exception of the 'Digital transformation projects' and 'Digital business models', the elements of 'Changing value structures through digital transformation', including digital products and services, digital business processes, and digital customer interfaces, are not covered by the ten success-critical focus areas, defined in chapter 5. The reason is again, that they focus exclusively on the actual management of the digital transformation and not on specific components, such as business processes, products, and services, which should be digitalized in the course of a digital transformation.

The leadership of a digital transformation is integrated in the model within the element 'Develop strategies and structures for the digital transformation'. Therein, management roles in the digital transformation, their characteristics and tasks, and interrelationships are described. The model puts special emphasis on the role of the

[23] Cf. Hess (2019, pp. 8–10).

[24] Cf. Hess (2019, pp. 8–10).

[25] Electronic supplementary material: The electronic version of this chapter contains supplementary material that is available to authorized users (https://doi.org/10.1007/978-3-658-36158-7_7).

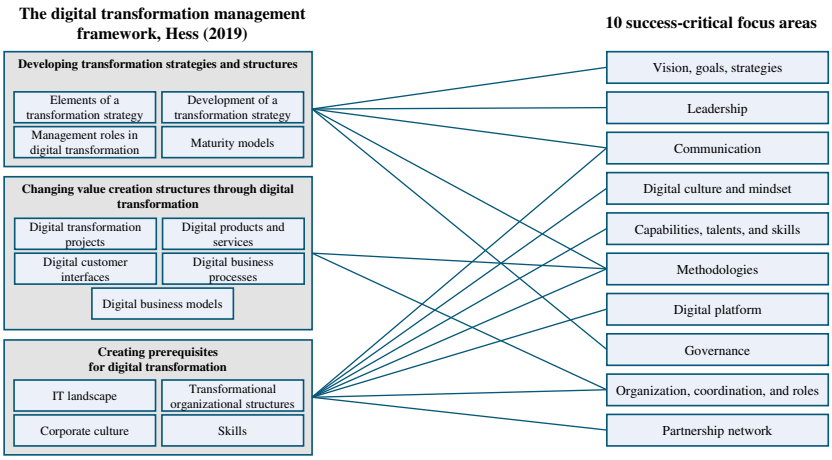

Figure 7.6 Analysis of the 'Digital transformation management framework' by Hess (2019). (Source: Own illustration.)

CDO and his interactions with the CEO and CIO. Moreover, the role of the leadership in cultural change is addressed within the element'Creating prerequisites for digital transformation'.

The model does not focus on defining a transformation vision and specific goals, rather it focuses on defining a transformation strategy. The transformation strategy represents the systematic approach to digital transformation, provides the guidelines and framework for undergoing the transformation, and defines the targeted direction of change. These aspects are integrated into the model's element 'Developing strategies and structures for digital transformation'.

The model integrates communication into the element 'Developing strategies and structures for digital transformation'. It describes and recommends the deliberate use of a variety of digital media and communication channels to engage employees in the transformation journey. The model considers communication as a key prerequisite for a digital corporate culture, enabling agility, which is discussed in the element 'Creating the prerequisites for digital transformation'.

The digital culture and mindset are incorporated in the 'Digital transformation management framework' within the element 'Creating prerequisites for digital transformation'. The model describes a digital culture as a catalyst for the success of a digital transformation, by promoting the company's transformation from an analog to a digital company that fully exploits the potentials of digital technologies. A

digital culture and mindset are presented as the basis for companies to adapt and act flexibly as well as to anticipate future digitally driven innovations. The model includes detailed descriptions of the targeted values of a digital culture and suggestions of how a company can successfully undergo the cultural change. The promoted values, employee orientation, market orientation, and agility are mostly consistent with the values described in the success-critical focus area.

Developing skills and talents is discussed in the 'Digital transformation management framework' as part of the element 'Creating the prerequisites for digital transformation'. The model distinguishes between digitalization and transformation skills, both of which can be mapped to the identified and targeted skills of the success-critical focus area 'Capabilities, skills, and talents'. The model suggests how the skills can be developed and integrated into the organization, distinguishing between internal, external, and hybrid measures.

The 'Digital transformation management framework' provides numerous methodologies and tools for each of its three elements 'Developing transformation strategies and structures', 'Changing value creation structures through digital transformation', and 'Creating prerequisites for digital transformation'. There exist many commonalities between the methods proposed in the model and the methods defined in the success-critical focus area. However, the model suggests methods that are not incorporated in the success-critical focus areas, for example in the area of competence and talent development. These could therefore be used to further enhance the success-critical focus area 'Methodologies' and offer companies an even wider range of options.

The model incorporates the digital platform in the element 'Creating prerequisites for digital transformation'. Hereby, the model focuses on a suitable IT landscape, meeting the requirements of digital transformation, rather than on specific technology that ais important for management and communication in the context of digital transformation or for the development of targeted capabilities. It suggests the establishment of bimodal IT or the introduction of cloud technologies.

The term 'governance' is never explicitly mentioned in the 'Digital transformation management framework'. Nevertheless, the focus area 'Governance' is addressed in the subsection 'Developing strategies and structures for digital transformation', where approaches to resolve budgeting questions of digital transformation initiatives as part of strategy development are discussed.

In the 'Digital transformation management framework', the focus of the descriptions and recommendations for action are put on the integration of digital transformation and the individual transformation initiatives into the corporate organization. These are integrated into the elements 'Developing strategies and structures for digital transformation' and 'Creating prerequisites for digital transformation'.

The model recommends that organizations create a specialized staff unit, led by a CDO, which is tasked with formulating the digital transformation strategy and, in particular, with coordinating the digital transformation initiatives. The model does not consider individual transformation initiatives as isolated problem-solving projects, but as projects embedded in a complex intertwining of operational and social relationships. It proposes a separate temporary project organization within the core organization, linked to the relevant decision makers, to enable a fast, simple, and flexible approach. Moreover, the model addresses the definition of relevant management roles, their responsibilities, and interactions in the context of a digital transformation as well as relevant roles within a transformation initiative in the elements 'Developing strategies and structures for digital transformation' and 'Changing value creation structures through digital transformation'.

In the 'Digital Transformation Management Framework', the focus area 'Partnership network' is addressed in the element 'Creating the prerequisites for digital transformation'. Therein, different approaches to opening company boundaries for innovations are discussed. The criteria of a regular exchange of information and communication as well as the definition of common goals and strategies as a basis for a trusting relationship are not specifically addressed within the model.

The model of Hess is a highly detailed framework that offers a systematic and structured approach for managing a digital transformation. Due to its holistic perspective on digital transformation, it sets priorities comparable to those of the success-critical focus areas defined in this work. However, not all defined success factors are addressed in the model, neither concrete measures for their implementation are proposed. Even though the three elements 'Developing a transformation strategy', 'Changing the value creation processes', and 'Creating prerequisites for digital transformation', are too vague in their statements to be operationalized, the model succeeds in operationalizing each element individually with the descriptions of various concepts and instruments presented within each element.

7.3 Conclusions of the Analysis of the Management Models

Within the last two subchapters, various approaches that are intended to provide guidance to companies, and specifically to their management, on how to successfully master and benefit from digital transformation. They are intended to offer a common language and a method-based approach, making the digital transformation comprehensible and manageable. From the overall 16 management models reviewed, two models were identified, following a particularly holistic approach

to structuring the management of a digital transformation and reflecting the ten success-critical focus areas best—the 'Digital transformation framework' by Westerman et al. (2011) and the 'Digital transformation management framework' by Hess (2019).

The review of the existing management models and the detailed analysis of the two models confirmed the relevance and applicability of the ten success-critical focus areas of a digital transformation. Even if not each focus area is defined as an individual element of a model, they were consistently identified within the majority of the models reviewed. Therein, the models differ in the level of detail and in the proposed measures for implementing the respective focus area. Nevertheless, no reviewed model of the management of a digital transformation could be identified that holistically addresses all identified success-critical focus areas and the associated success factor clusters and proposes concrete measures for their implementation.

Especially the detailed analysis of the 'Digital Transformation Framework' and the 'Digital Transformation Management Framework' reveals that specific building blocks of a digital transformation, such as the business processes, customer interfaces, products and services, and the business model, are integrated into the two models. They describe and suggest specific measures for digitalizing and adapting these in the course of the digital transformation. Therefore, it is recommended that a framework for a management model of digital transformation takes these into account and provides companies with a structured concept and set of tools to address the building blocks.

8 Framework for a Management Model of Digital Transformation

In chapter 5, success factors are presented for managing a digital transformation deduced from a literature analysis and semi-structured interviews. These success factors are grouped into ten success-critical focus areas: 'Vision, goals, and strategies', 'Leadership', 'Communication', 'Digital culture and mindset', 'Capabilities, talents, and skills', 'Governance', 'Organization, coordination, and roles', 'Management methodologies', 'Digital platform', and 'Partnership network'. In chapter 7, existing approaches for managing a digital transformation are described, analyzed, and evaluated, applying the criteria catalog developed in chapter 6.

Subsequently, in chapter 8, a framework for a management model of digital transformation is presented based on the findings of the previous chapters. It is intended to serve as a basis for the development of a detailed management model of digital transformation. The framework for a management model of digital transformation structures the management's tasks and responsibilities, arising in the context of a digital transformation. It follows a holistic perspective, considering relevant steering elements and their interdependencies. For this purpose, the ten defined success-critical focus areas of a digital transformation serve as a structure for the development of the framework, intended to be the 'skeleton' of a management model.

The devised framework, summarizing the findings of this work is shown in figure 8.1.

In the center of the framework for a management model of digital transformation, the 'digital building blocks' are located. They represent the objects that are being digitalized or enhanced with digital technologies as part of a digital transformation. Thus, they exploit the possibilities of digitalization to generate new, promising benefits. The products and services, business processes, and business

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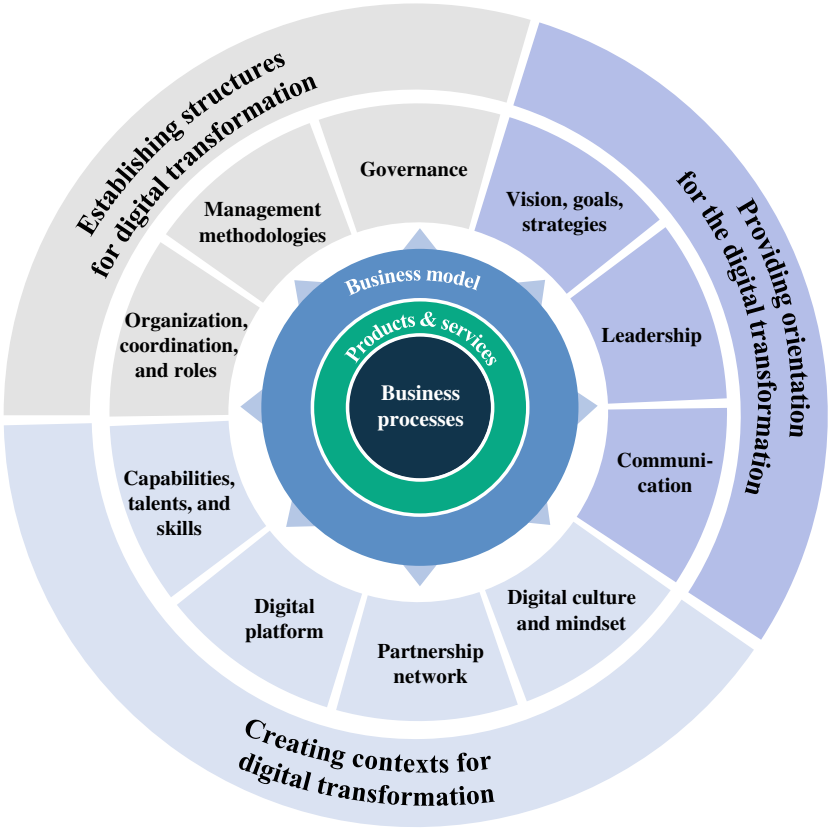

Figure 8.1 Framework for a management model of digital transformation. (Source: Own illustration.)

model were specifically identified as relevant in the analysis of the two management models by Westerman et al. (2011) and Hess (2019). Therefore, they are included in the framework as digital building blocks. In further research, they need to be investigated, validated, and defined more precisely in order to enhance their contribution to a successful management model of digital transformation.

The ten success-critical focus areas of a digital transformation are arranged around the digital building blocks. Any decisions made within the success-critical

focus areas have an impact on the inner building blocks of a digital transformation. They are grouped into the following three categories: 'Establishing structures for digital transformation', 'Providing orientation in digital transformation', and 'Creating contexts for digital transformation'. In the following, the three categories are explained, and the associated success-critical focus areas are summarized.

Providing orientation in digital transformation:
Digital transformation is fundamentally associated with uncertainties among those affected. The uncertainties can be reduced through orientation and, at best, transformed into certainties.[1] A strategic orientation "reflects the firm's philosophy of how to conduct business through a deeply rooted set of values and beliefs that guides the firm's attempt to achieve superior performance"[2]. In order to provide orientation during a digital transformation, three success-critical focus areas are particularly relevant—'Leadership', 'Communication', 'Vision, goals, and strategies'.

Providing orientation is first and foremost a leadership task. A leader who successfully fulfills his or her role, initiating and leading a digital transformation, ensures that willingness to change is built, orientation is provided, motivation is generated and maintained, and that the transformation process itself is managed efficiently.[3]

Leadership consists to a large extent of communication, which in turn has the task of conveying information. People involved need to be informed about the goals, the progress of the transformation, and the resulting outcomes in order to understand their own actions in a broader context and to coordinate actions with others. Communication is a catalyst for a digital transformation, fostering transparency, motivation, networking, and conflict resolutions, and is thus related to almost all other focus areas.[4]

A vision points the way to digital transformation, inspires those involved, and provides fundamental orientation by painting a realistic but challenging picture of a company's future. Goals are the steppingstones leading to the vision, while strategies

[1] Cf. Lauer (2021, p. 69).

[2] Gatignon and Xuereb (1997).

[3] Detailed descriptions of the success-critical focus area 'Leadership' can be found in chapter 5.2.

[4] Detailed descriptions of the success-critical focus area 'Communication' can be found in chapter 5.3.

are the plans developed to achieve the defined goals. Together, the vision, goals, and strategies provide a clear direction for transformation and create orientation.[5]

Establishing structures for digital transformation:
Structures are particularly relevant in transformation processes, as humans need a visible structure of action. Creative variations of the established become only possible when their fundamental principles and structures are understood.[6] Therefore, a lack of target-oriented structures has a negative impact on learning and transformation processes.[7] Within a digital transformation, structures are established by three success-critical focus areas: 'Governance', 'Management methodologies', and 'Organization, coordination, and roles'.

Governance plays a fundamental role in digital transformations, serving as the steering wheel and providing the guardrails to guide a company's digital activities in the right direction. It supports the management of digital transformation risks, drives its success, and enables the development of new digital capabilities, by providing the legal and factual regulatory framework for managing and monitoring a company.[8]

A methodology describes the general strategy for solving a problem, acting as a guideline that enables the practitioner to make decisions within a specific set of rules. It therefore provides a structure for how problems are approached, and solutions are developed. The success-critical focus area 'Management methodologies' provides a framework for possible applicable methodologies that can be used to fulfill the tasks associated with managing a digital transformation.[9]

In order for transformation to become deeply anchored in the organization, companies must review their organizational structures for their suitability for a digital transformation and adapt them if necessary. A systematic and structured approach that integrates digital transformation into the corporate organization, coordinates individual transformation initiatives, and defines clear roles and responsibilities, is essential. These structures provide the necessary order within which a digital transformation can be successfully initiated, driven, and sustained.[10]

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[5] Detailed descriptions of the success-critical focus area 'Vision, goals, strategies' can be found in chapter 5.1.

[6] Cf. Lauer (2021, pp. 69–70).

[7] Cf. Beck (2003).

[8] Detailed descriptions of the success-critical focus area 'Governance' can be found in chapter 5.6.

[9] Detailed descriptions of the success-critical focus area 'Management methodologies' can be found in chapter 5.8.

[10] Detailed descriptions of the success-critical focus area 'Organization, coordination, and roles' can be found in chapter 5.7.

Creating contexts for digital transformation:
A digital transformation can only be successful if it is embedded into the right corporate contexts with foresight. This involves building and developing 'Capabilities, talents, and skills', establishing a suitable 'Digital platform', building a 'Partnership network', as well as establishing a 'Digital culture and mindset'.

An organization's ability to act is fundamentally determined by its capabilities, talents, and skills. A capability describes the ability, capacity, and expertise what a company does in order to achieve a specific purpose or result. They represent the primary sources of competitive advantage for a company. Capabilities should be durable and persist over time despite constantly changing business requirements. Therein, dynamic capabilities, that enable an organization to renew and recreate its strategic resources, as well as managerial improvisation, that enables an organization to react rapidly and creatively to unexpected events in the face of uncertainty, are particularly relevant. These can be fostered by two digital capabilities—a flexible IT infrastructure (software, hardware, and network) and a well-developed information management.[11]

Contrary to popular belief, digital transformation is less about technology and more about people and thus about people's ability to implement and use technology. Having a certain level of technological understanding, processual and specialist knowledge is highly relevant. Being able to quickly acquire new knowledge and skills, being flexible, eager to learn, and interested in the skills, trends, and technologies are also in demand. For the additional and changing requirements resulting from digital transformation, companies need to focus on retraining and upskilling talents and on attracting talents from outside the company.[12]

A company's digital platform consists of the technologies, applications, and data, enabling a company's business processes. The technologies, applications, and data of the digital platform should be selected to serve the company's goals, creating the foundation for the digital transformation, the deployment of new generations of technologies, innovations and the necessary changes that accompany it. Thus, the desired future of the company should determine the digital platform to be used and not vice versa.[13]

Digital transformation requires companies to collaborate in new ways with players outside their own organization, as the products, services, and value propositions

[11] Detailed descriptions of the success-critical focus area 'Capabilities, talents, and skills' can be found in chapter 5.5.

[12] Detailed descriptions of the success-critical focus area 'Capabilities, talents, and skills' can be found in chapter 5.5.

[13] Detailed descriptions of the success-critical focus area 'Digital platform' can be found in chapter 5.9.

offered, increasingly depend on a company's ability to attract the right partners and become part of a digitally connected ecosystem. Digital transformation can therefore be accelerated by building an ecosystem of partners with facilitating capabilities and assets. In doing so, it is important to actively seek new opportunities to attract, to connect, and to build a business relationship with partners outside the organization.[14]

A company's culture and mindset reflect the personality of a company, representing its unique DNA. In the best case, a digital culture and a growth mindset act as catalysts for the digital transformation. A digital culture is characterized by a variety of values and distinctive behaviors among employees and across the organization that drive new, digitally-enabled ways of thinking, working, and interacting, between employees and business units, with customers, and with new digital tools. Employees' mindsets become obvious in new difficult situations, when a change in behavior is required. People with a growth mindset assume that character, intelligence, and creative ability aren't static, but rather can be developed, embracing challenges, valuing criticism, and considering failures as an opportunity to learn and to widen existing abilities.[15]

When developing a management model based on the presented framework, it is crucial that a model's properties 'mapping' and 'reduction' are not neglected. Based on 'mapping', a model is always a model of something and therefore it cannot be identical with its original archetype. It needs to reduce the features of the archetypes in order to reduce its complexity, be manageable and comprehensible.[16] Therefore, when developing a model, the depth of detail of the information should always be weighed against its clarity and comprehensibility.

In this context, it could be one possibility to divide the model into several levels, differing in their depth of detail. At the top level, the management of a company could be provided with an overview of the most important elements of a systematic approach for successfully undergoing a digital transformation. Then if desired, the depth of detail should be increased, when looking at the lower levels of the respective element of the model. At the most detailed level, it should be possible to select specific concepts and tools that operationalize the tasks arising, when managing a digital transformation. These concepts and tools should be adaptable to the specific requirements and demands of the respective company.

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[14] Detailed descriptions of the success-critical focus area 'Partnership network' can be found in chapter 5.10.

[15] Detailed descriptions of the success-critical focus area 'Digital culture and mindset' can be found in chapter 5.4.

[16] Detailed descriptions of the properties of a model can be found in chapter 3.3.

Conclusion and Outlook

9

The success of a digital transformation is not a foregone conclusion.[1] It is not sufficient that companies recognize the importance of digital transformation and drive it forward within various initiatives.[2] Rather, a successful digital transformation requires a systematic approach, that guides the management of a digital transformation and assists in dealing with the constant complexity and market dynamics of a revamped digital economy.[3]

From a systems-oriented perspective, any management activity must be embedded in diverse contexts and always be considered interdependent with other activities, elements of the organization, and its environment.[4] A digital transformation, as a highly complex process, impacting major areas of an organization, requires a systems-oriented and systematic approach that goes beyond individual transformation initiatives and shows how a digital transformation can be specifically managed and facilitated throughout a company.[5]

This work is dedicated to integrating existing approaches for managing a digital transformation to provide a holistic framework for management models of digital transformation. It answers the research question "How can a framework for management models, resulting from the analysis of success factors, be structured to provide companies with guidance for a successful digital transformation?"[6]

[1] For example: Cf. Tabrizi et al. (2019); Forth et al. (2020).

[2] Cf. Hess (2019, pp. 3–4).

[3] Cf. Romero et al. (2019, p. 1); Bollard et al. (2017, p. 3); Hess and Barthel (2020); Brings and Weber (2020); Gimpel et al. (2018, p. 47).

[4] Cf. Rüegg-Stürm and Grand (2019, p. 40).

[5] Cf. Gimpel et al. (2018, p. 47); Hess (2019, pp. 3–4).

[6] See chapter 1.1.

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For the development of the framework, relevant success factors of a digital transformation were identified by analyzing a total of ten articles of renowned business schools, consultancies, and scientific literature. To validate and extend these success factors, eight one-to-one interviews, following a semi-structured methodology, were conducted. The eight interviewees drew on experiences in a total of 29 companies, headquartered in Germany and operating in a wide range of industries, in which they have accompanied digital transformations in coordinating roles, ensuring a broad and integrated perspective on managing a digital transformation.

The analysis revealed ten success-critical focus areas of a digital transformation: 'Vision, goals, and strategies', 'Leadership', 'Communication', 'Digital culture and mindset', 'Capabilities, talents, and skills', 'Governance', 'Organization, coordination, and roles', 'Management methodologies', 'Digital platform', and 'Partnership network'. The focus areas comprise nearly 60 success factor clusters that were built based on the specifically identified success factors. However, these are by no means clearly separable from one another; there are overlaps and mutual influences, underscoring the complexity of a digital transformation. A digital transformation can only be successful by managing the interdependencies and interactions of all focus areas, following a holistic view of a variety of relevant aspects.

There already exist diverse approaches of digital transformation management by various management consultancies as well as scientific and academic institutions that are intended to provide a systematic guideline on how companies can successfully manage a digital transformation.[7] 16 management models were reviewed with regard to their target-group, content, focus, and intended purpose. Following a system-oriented perspective, from the overall 16 management models, two object-oriented models were identified, that focus on structuring the digital transformation into its specific steering elements and their interdependencies. These models were analyzed based on a criteria catalog, incorporating the ten success-critical focus areas of a digital transformation and its respective success factor clusters. The criteria catalog examines if a specific thematic dimension is addressed and if specific measures for its implementation are identified within a management model. The reviewed models follow a particularly holistic approach and reflect the ten success-critical focus areas best—the 'Digital transformation framework' by Westerman et al. (2011) and the 'Digital transformation management framework' by Hess (2019).

[7] For example: Cf. Bürkner et al. (2016, p. 117); Bloching et al. (2015, p. 34); Uhl and Gollenia (2016); Henke et al. (2020).

The review of existing management models confirmed the relevance and applicability of the ten success-critical focus areas of a digital transformation, because even if not every focus area is defined as an individual element of the model, they were consistently identified within the majority of the models examined. Therein, the models differ in the level of detail of the explanations and in the proposed measures for implementing the respective focus area. Nevertheless, no reviewed model of the management of digital transformation could be identified that holistically addresses all identified success-critical focus areas with its respective success factor clusters and proposes concrete measures for their implementation.

Based on the ten success-critical focus areas, the respective success factors, and the evaluation of existing management models of a digital transformation, this paper provides a systematic framework for a detailed management model of digital transformation. The framework structures the management's tasks and responsibilities, arising in the context of a digital transformation, following a holistic perspective, and considering relevant steering elements and their interdependencies.

The ten success-critical focus areas of a digital transformation serve as a structure for the development of the framework. They are arranged around the center of the framework—the digital building blocks: The 'Products and services', 'Business processes', and 'Business model', representing the objects that exploit the possibilities of digitalization to generate new, promising benefits. The ten success-critical focus areas can further be divided into three categories, representing the outer circle of the framework: 'Establishing structures for digital transformation', 'Providing orientation in digital transformation', and 'Creating contexts for digital transformation'.

The developed framework does not claim to serve as a concrete, and detailed management model of digital transformation. Rather it is intended to serve as a basis for the future development of a management model, addressed to executives and experts who are tasked with launching, driving, and sustaining a digital transformation and are aiming for a systematic and scientific approach. The general relevance and applicability of the developed holistic framework for a management model of digital transformation is ensured by the analysis of articles and business and management publications of renowned business schools, consultancies, and scientific literature, the conduction of eight semi-structured interviews, comprising experiences from almost 30 companies, and by the review of 16 approaches for managing a digital transformation.

To ensure that the model to be originated operationalizes the management of a digital transformation sufficiently, specific measures and instruments must be

developed for each element of the framework. These measures and instruments should offer a comprehensible guidance, adaptable to the specific requirements and demands of the respective company. As the focus of this paper is primarily on a holistic perspective of management, the individual elements, concepts, and instruments, described in chapter 5, should be further elaborated by consulting scientific literature, examining the relevant individual facets of a digital transformation, and conducting further quantitative and qualitative studies.

When developing the management model, a balance must be reached between sufficient depth of detail and operationalization of the model's elements and a manageable level of complexity. Therefore, it is recommended to divide the model into several levels, differing in their depth of detail. Whereby at the top level, the management of a company is given an overview of the most important elements of a systematic approach for a successful digital transformation, and at the most detailed level, specific concepts and tools are presented that operationalize the tasks arising, when managing a digital transformation.

In order to determine which concepts and instruments are specifically suited to a company, it is advisable to apply a maturity model of digital transformation, determining the status quo of a company's digital transformation. Many existing models can be referenced[8], which would need to be analyzed and evaluated with regard to their suitability. However, it is advisable to develop a specific maturity model based on the ten success-critical focus areas of a digital transformation and the criteria catalog, presented in chapter 6. In this way, the maturity model is specifically aligned with the management model to be developed and concrete conclusions can be drawn for the application of the proposed concepts and instruments. With regard to a holistic framework, combining both the steering elements and the building blocks of a digital transformation, a maturity model should link the two levels of a digital transformation—the first level 'management of the digital transformation' and the second level 'digital transformation in specific areas of a company.

[8] For example, the Digital Maturity Matrix by the MIT Center for Digital Business and Capgemini Consulting (Cf. Westerman et al. (2011)) or the 'Digital Maturity Model' by the University of St. Gallen and Crosswalk (Cf. IWI-HSG and Crosswalk (2015)).

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