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„Digitalization of Collaboration and Communication in German SMEs: Using Design Thinking Methods to Develop Strategic Thrust for a Digital Transformation"

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Abstract

The effective use of digital technology and disruptive innovations are increasingly shaping the way companies survive in today's markets. Consequently, the need for German Small and Medium Enterprises (SMEs) to perform a digital transformation, which implies the creation of a new business model through sophisticated technologies, is gaining significance for succeeding in the digital age. While most German SMEs have already accomplished a digitization of their collaboration and communication, a profound digital transformation is still imminent for the majority. Based on the investigation of existing literature on the subject, this paper demonstrates the suitability of design thinking methods to develop strategic thrust for a digital transformation. The key potential of design thinking is rooted in its ability to creatively solve problems and reinforce skills needed to address dynamic environments. An exemplary result of using design thinking to develop strategic thrust is presented with the fictional business model GreenCube. The concept aims to assist German SMEs in performing a digital transformation by simplifying the incorporation of sophisticated digital technologies and providing opportunities for networking and thus integrating into an ecosystem. Despite their potential, design thinking activities involve several challenges including the incongruence of pre-defined specifications and designed concepts, the gap between a focus on time-reduction and a focus on experimentation, and the lack of measurability of design thinking gains. Nevertheless, the nature of businesses' internal and external environment is becoming ever more fast-paced, making the ability to manage change increasingly critical for German SMEs to establish competitive advantage.

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List of Abbreviations

BMI   Business Model Innovation

SMEs   Small and Medium Enterprises

1. Introduction

"According to Darwin's Origin of Species, it is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself."[1]

Even though Charles Darwin could not have anticipated the world's development, his thoughts accurately capture the essence of businesses' survival in today's fast-moving environment. Numerous megatrends, such as New Work, Globalization or Connectivity, are shaping the economic situation for organizations worldwide and companies are required to quickly adapt to them. Digital technology constitutes a crucial factor which not only connects but even initiates the majority of these transformations.[2] The variety of digital tools on the market particularly revolutionizes the very nature of businesses' collaboration and communication. Today, geographically dispersed employees collaborate effortlessly via videoconferences and cloud systems and physical locations are becoming less relevant.

While the use of digital tools has been established in the workplace over the past years, a profound digital transformation necessary to survive among the constantly evolving competition has not yet been accomplished by most businesses. The introduction of a simple digitization of communication and collaboration in the workplace is insufficient for maximizing value in the fast-moving digital age. Instead, companies need to restructure themselves holistically by performing a digit__al__ization of communication and collaboration and ultimately a profound digital transformation.

These changes increasingly demand adaptability, flexibility and agility from companies. Small and medium enterprises (SMEs) are considered to carry greater potential to meet this demand, as their structures allow for a quicker reaction to modifications in the external and internal environment. Large companies have identified their lack of flexibility and adapt by subdividing their business operations into smaller units. However, SMEs still need to learn how

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[1] Megginson (1963), p. 4
[2] Cf. NACD (2018), p. 7

to fully exploit their structural benefits. The majority of SMEs in Germany, for instance, do not possess the required knowledge about the distinct stages of digitalization and, therefore, consider the transformation complete too early.[3]

In order to utilize their maximum potential, SMEs will have to reflect deeply on their approach towards digitalization and specify where they want to position themselves strategically in the following years. Design thinking can facilitate the development of strategic thrust in the digital age by fostering SMEs' creativity, innovation and flexibility. Its practical and resourceful methodology encourages outside-the-box thinking and empowers companies to be more open to transformations. By using the example of digitalization of collaboration and communication in German SMEs, this paper investigates the suitability of design thinking methods for developing strategic thrust for a digital transformation.

The analysis is based on the review of existing literature on the subject, including articles from scientific journals and publications from management consultancies. The thesis also encompasses a meta-analysis of empirical studies. In addition, it examines how design thinking methods can contribute to finding strategic thrust for German SMEs with respect to the digitalization of collaboration and communication. The results lead to the development of a fictional business model called GreenCube, which provides various approaches to systematically address the current challenges faced by German SMEs.

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[3] Cf. Daheim, Korn, Wintermann (2017), p. 9

2. Digitalization of Collaboration and Communication in German SMEs

2.1 Digitization, Digitalization and Digital Transformation

Investigating the field of digital technology, three key terminologies arise: digitization, digitalization and digital transformation. Despite common perception, digitization and digitalization represent two distinct processes. Digitization describes the substitution of a physical element with a digital variant or the shift of a business operation from analogue to digital.[4] Uploading a file and sending it via email instead of mailing it by post serves as an example. By contrast, digit<u>al</u>ization represents a more profound and comprehensive transformation and strives for the creation of new value by putting digital information at the center of the company's operations.[5] Instead of simply employing digital tools as assistance in the workplace, the process of digitalization demands a holistic restructuring of the business to reap value from using digital technology.[6]

The relationship between digitalization and digital transformation has generated conflicting interpretations from different researchers. According to Gobble, digitalization is equivalent to digital transformation, as the latter similarly implies a pervasive transformation of the business to efficiently utilize digital technology. The objective is to continually improve and observe and react to market changes immediately.[7] In contrast, Savić draws a clear line between both terminologies. According to Savić, digitalization embraces a holistic restructuring process whereas the emphasis of a digital transformation lies in establishing an entirely new business model through the use of advanced computer and information technologies. Savić regards digital transformation as the efficient application of existing resources to fundamentally change the core of a company – including its strategy, culture, structure and technologies. Furthermore, decision-making and operations are focused on the customer.[8] While Gobble's approach fails to address the element of creating a new business model, Savić manages to classify digital transformation more precisely. For this reason, this paper is based on Savić's definition of digital transformation.

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[4] Cf. Orellana (2017), p. 12
[5] Cf. Gobble (2019), p. 66
[6] Cf. Brennen, Kreiss (2014)
[7] Cf. Gobble (2019), p. 66
[8] Cf. Savić (2019), p. 38

2.2 Status quo 2019: Digitization of Communication and Collaboration in German SMEs

A great part of German SMEs has already accomplished digitizing communication and collaboration in their workplace. Flexible and mobile ways of working caused by geographical dispersion or flexible work schedules lead to an increase in communication, both within one company as well as between multiple companies, via digital channels and social networks.[9] Businesses are widely equipped with sophisticated computer-based collaboration and communication tools, so called *social technologies*. These tools supplement traditional tools, like emails or phone calls, and simplify organizational collaboration.[10] The market offers a wide range of digital communication and collaboration technologies – from message-based apps including social media applications to project collaboration platforms as well as cloud computing applications, wikis, blogs, internal company networks and videoconferences. Even though social technologies appear in many different forms, most of them contain common features, which are listed below:[11]

1. Instant Messaging	2. Alerts and notifications
3. Creation of teams or groups	4. Uploading of files
5. Collaboration via files	6. Searching
7. Reporting	8. Sharing of updates

Social technologies can be split into tools dedicated for communication, teamwork or productivity. While communication applications include social networks or chats, for instance, teamwork applications encompass project management software, file-sharing solutions or cloud-based productivity platforms. The category of productivity applications is closely linked to teamwork and mostly covers organization tools, such as calendar and task management solutions.[12]

In a survey, the McKinsey Global Institute found that social technologies are becoming more incorporated into the daily work of businesses worldwide and that messaging platforms are

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[9] Cf. Cliff (2015), p. 26
[10] Cf. Hessen (2018), p. 32
[11] Cf. Harrin (2016), p. 53
[12] Cf. Hille, Schwalm (2018), p. 9

one of the most common tools to be established.[13] The use of social technologies is expected to further increase in the future. As shown in Figure 1, the size of the collaboration software market worldwide is predicted to grow continuously over the next three years, with an expected size of 9.84 billion U.S. dollars in 2022.
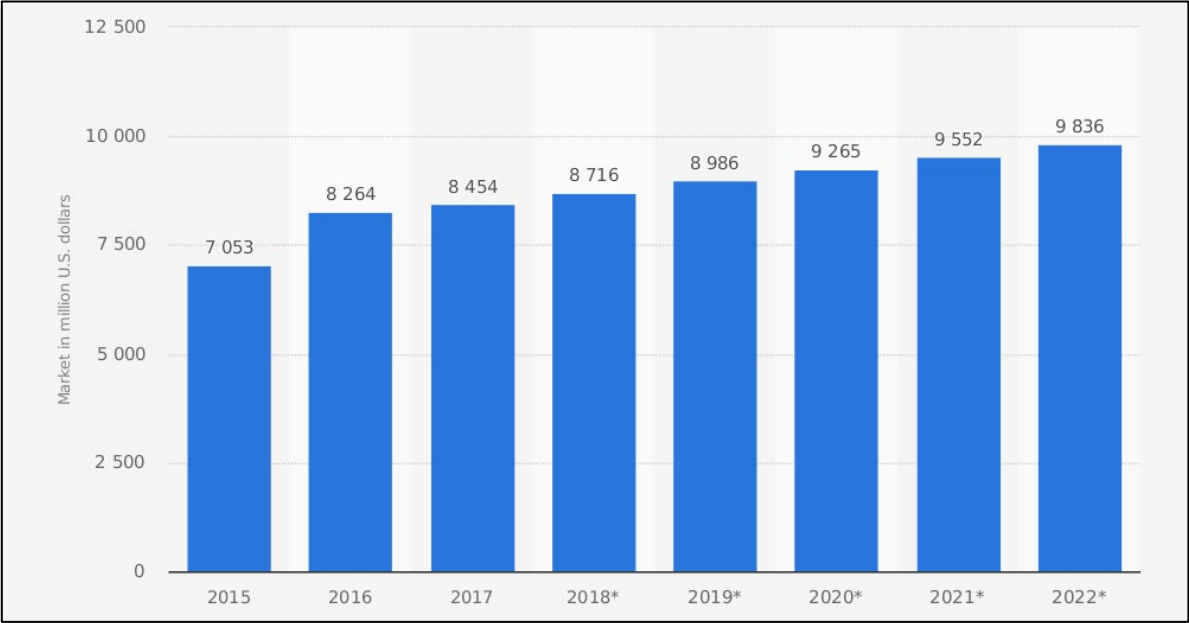

Figure 1: Collaboration software market revenues from 2015 to 2022 (in million U.S. dollars)

Likewise, the International Data Corporation forecasted an annual growth of 9.5 percent from 2015 to 2018 for the market of collaborative applications, such as company social networks or team collaboration apps, and considers a further growth very likely.[14]

For German SMEs, social technologies in the workplace are no novelty either. A study has revealed that 90 percent of German companies provide applications for digital collaboration and communication. However, many SMEs are using obsolete technologies that no longer meet today's requirements. The study found that these businesses are planning to optimize their use of social tools for the future: Around 65 percent of German SMEs intend to increase their investment in the digital workplace of their employees in the coming years.[15]

These investments can be justified by the many ways in which social technologies enhance the communication and collaboration of SMEs. They enable a more frequent communication

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[13] Cf. Bughin et al. (2017a)
[14] Cf. Collett (2015), p. 22
[15] Cf. Hille, Schwalm (2018), pp. 14-16

and allow for real-time interaction, which improves efficiency overall.[16] As geographically dispersed employees are able to connect worldwide through digital collaboration tools, the need for physical working space becomes less crucial. For this reason, companies are more flexible in choosing their locations and forming conglomerate teams of employees.[17] Moreover, the use of social technologies affects the very nature of work itself: by interacting and sharing knowledge with team members via digital tools, work becomes less function- or team-based and more project-oriented. At the same time, teams are given the opportunity to self-organize and, consequently, assume more responsibility.[18] Findings of a research study on the efficiency of the use of social media technologies for collaboration in SMEs show that these companies foster their innovation performance by using social media tools for internal knowledge sharing.[19] Other studies reveal that information and communication technologies simplify knowledge sharing and enhance collaboration channels, which further stimulate innovation and creativity.[20]

While several studies substantiate the various benefits and opportunities that advanced digital communication and collaboration technologies bring, evidence also shows that social tools do not always ensure increased productivity and, in some ways, even constitute a substantial distraction. Despite a reduction in frequency of emails, the total number of messages sent among employees increased. As human behavior is predetermined to respond to incoming stimuli, incoming messages are a major distraction and cause time delays on projects. Maintaining an overview of the exchanged information becomes harder when messages are sent across multiple communication applications.[21] In addition, information overload makes it difficult for employees to distinguish and filter important from unimportant information. A survey found that 81 percent of the interviewed executives using advanced communication and collaboration tools claimed to struggle to keep projects up-to-date and ensure overview of management.[22] In order to prevent disorientation among employees, a unified and central messaging and collaboration hub is required.[23]

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[16] Cf. Bughin et al. (2017a)
[17] Cf. Allison (2018), p. 19
[18] Cf. Bughin et al. (2017a)
[19] Cf. Pérez-González, Trigueros-Preciado, Popa (2017), p. 296
[20] Cf. Soto-Acosta, Cegarra-Navarro (2016), p. 418
[21] Cf. Collett (2015), p. 22
[22] Cf. Allison (2018), p. 19-21
[23] Cf. Collett (2015), p. 22

Furthermore, productivity can also be negatively affected by creating and spreading incorrect or inappropriate information. Unjustified statements, gossip or rumors are all examples of how employees can disseminate counterknowledge within the company and social technologies facilitate the spreading of such. Additionally, these technologies often substitute face-to-face interaction and thus promote distance and anonymity, which leads to employees feeling less connected and makes it harder for them to identify themselves as part of a team. In this context, trust constitutes a precondition for successful collaboration in the era of digitalization. The risks of counterknowledge as well as distance and anonymity that digital tools bring can only be eliminated if employees assess their colleagues to be credible and trustworthy.[24]

Most issues with social technologies restraining productivity appear to be especially grave within companies where large teams have to manage collaboration. According to Collett, businesses with 20,000 employees or more face severe difficulties in utilizing the productivity benefits of social tools. Large enterprises often fail in this regard because they lack a unified and clear approach regarding the use of this technology and employees might not trust their colleagues. SMEs, on the other hand, have a chance to fully exploit the productivity gains of social technologies because operating in smaller teams facilitates the implementation of new digital tools in the workplace and the creation of trust among employees.[25] Michaelides et al. confirm that digital communication and collaboration tools in SMEs positively influence efficiency. They found that the use of these tools promotes knowledge flow among SMEs' employees and thus increases efficiency gains through the obtained collective knowledge. By generating new areas of knowledge and insights, the tools also enable SMEs to interact in global networks.[26]

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[24] Cf. Soto-Acosta, Cegarra-Navarro (2016), pp. 418-419
[25] Cf. Collett (2015), p.22
[26] Cf. Michaelides et al. (2013), p. 2044

2.3 The Need for a Shift towards Digitalization and Digital Transformation

Digitizing communication and collaboration may improve internal work and information processes and generate considerable efficiency and cost advantages. However, standing up to competition in the digital age requires a shift towards digit-*al*-ization and ultimately digital transformation.[27] In order to achieve the shift towards digitalization, German SMEs need to figure out how to use digital collaboration data and deploy applications that will generate the most value. For instance, Orellana suggests that successful collaborative processes could be captured and provided to other teams or even incorporated into an Artificial Intelligence. Once a problem is solved through a digitally recorded collaboration, similar challenges can be addressed faster and more efficiently. This would facilitate team collaboration and help create better solutions in the future. In order to fully exploit the digitalization of collaboration, the addition of virtual reality is required to fully replicate collaboration processes. Virtual reality technology creates an accurate digital representation of successful teamwork, which could be applied to future problems or even sold as a product.[28]

A majority of companies mistakenly select a digital tool and automatically expect change to follow. However, social tools can only accomplish improvement and realize their full potential if they follow and adapt to the employees' way of working. Project-oriented approaches as well as agile ways of working require an intensified collaboration through digital communication and collaboration tools, but with the increasing integration of social technologies into work processes companies also become more dependent on these tools. For a successful implementation of social technologies, businesses should first clarify the greater, integral changes in their ways of working and later decide on appropriate collaborative technologies that can support them.[29]

While the digitalization of communication and collaboration represents one further step towards developing strategic positioning in the digital age, SMEs ultimately need to consider how to achieve a digital transformation. As outlined before, a mere introduction of new technology does not yet guarantee a pervasive digital transformation. Research has revealed that an overly strong focus on technology is an obstacle to successful digital transformation.

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[27] Cf. Orellana (2017), p. 13
[28] Cf. ibid., p. 12-14
[29] Cf. Bughin et al. (2017a)

Instead, companies should engage in profound change and reconsider how employees work.[30] Kim and Mauborgne argue that many technological innovations fail to create and capture new markets, while value-innovation focuses on linking the innovation with benefits for the customer and, therefore, adds further value to the business.[31] Consequently, a technology alone cannot create additional benefit without first defining its role within the digital transformation.

A digital transformation is defined as the replacement of conventional with innovative business models by using sophisticated technologies.[32] As visualized in Figure 2, the process can be split into five stages, resulting in the creation of a new business model. This staged model helps managers define clear, tangible objectives for each year guided by the different sections.[33]
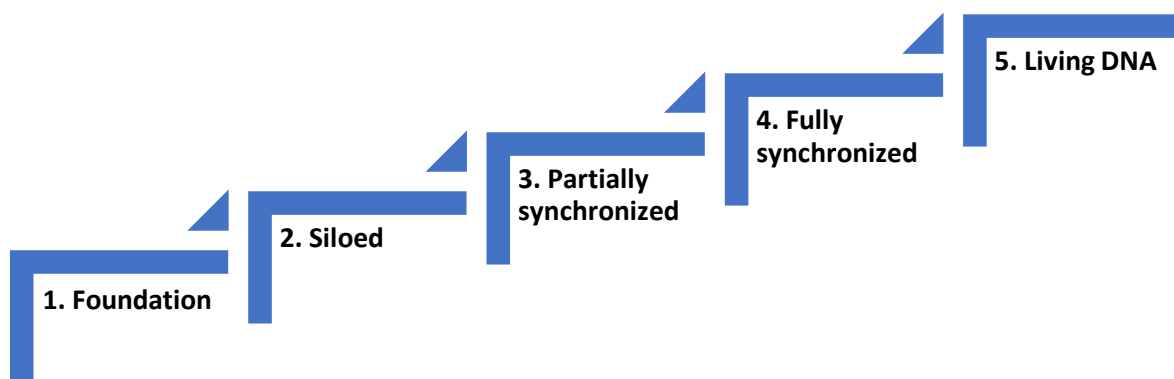

Figure 2: Five stages of a digital transformation

The first stage, Foundation, primarily describes the automation of processes. This stage can be equated with digitization, which, as previously stated, encompasses the substitution of a physical element with a digital variant or the shift of a business operation from analogue to digital. While it does not represent the core of digital transformation, digitization can be viewed as a prerequisite in order to proceed towards stage five. The next three stages depict the development from creating new business models for single functions or business units (stage 2) towards defining a desirable digital state for the future, which is either partially or fully executed within the company (stages 3 and 4). To complete the digital transformation,

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[30] Cf. McConnell (2015), p. 3
[31] Cf. Kim, Mauborgne (2016), pp. 37-38
[32] Cf. Yordanova, Stefanova (2019), p. 7
[33] Cf. Saldanha (2019), pp. 20-21

digital capabilities and skills need to be restructured and adapted to the new business model.[34]

The final stages of a digital transformation generating a new business model can be generally subsumed under the term business model innovation (BMI). Research of existing literature has revealed several benefits of BMI. Firstly, BMI contributes to the internationalization of SMEs: Researchers state that business models, which SMEs innovate in response to the uncertain and dynamic conditions on the international market, enhance the companies' international performance.[35] Furthermore, BMI contains considerable potential to add value for all stakeholders, including partners, suppliers and customers, and guides enterprises in their decision-making for establishing competitive advantage in the digital era.[36]

Linking BMI to the establishment of an ecosystem has been shown to be a key success factor in today's markets. Fast-growing businesses, such as Amazon or Google, act as role models in this regard, since they consider themselves as ecosystem players. An ecosystem enables participating enterprises to build value through networks and relationships rather than through tangible goods. This value creation is fostered by the potential to combine the capabilities, skills and resources of multiple companies.[37] Before entering an ecosystem, enterprises need to decide whether they want to navigate the ecosystem via a positioning, bottleneck or competency approach. While companies adopting a positioning approach strive for positions in the ecosystem which guarantee a high degree of bargaining power, the competence approach focuses on positions allowing firms to utilize existing skills as efficiently as possible. Companies following a bottleneck approach seek positions not yet discovered and occupied by other players, thus covering a niche in the ecosystem. The choice of business model has a direct impact on the approach as it defines the role of the company in the ecosystem. Hence, the BMI's impact on the ecosystem has to be clearly anticipated and prepared for in advance.[38]

The resulting implication for German SMEs is therefore to increasingly network with suppliers, partners and customers, and to define their own role in the ecosystem. The business models

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[34] Cf. Sandanha (2019), p. 21
[35] Cf. Asemokha et al. (2019), p. 440
[36] Cf. Zott, Amit (2017), p. 20
[37] Cf. Birkinshaw (2019), p. 3
[38] Cf. Demil, Lecocq, Warnier (2018), p. 1220

have to be adapted to this role and, following the requirements of stage five of a digital transformation, capabilities and skills of the company need to be restructured accordingly.

Currently, only few German SMEs provide an adequate incorporation of digital technologies and have the right mindset for a profound digital transformation. Only about 20 percent of all German SMEs currently possess a strategy in line with digitalization.[39] However, recent evidence suggests that a successful digital transformation requires a digital strategy.[40] Such a digital strategy serves the implementation of appropriate corporate objectives, which managers need to define in accordance with digitalization. In a study investigating the impact of strategy on digital transformation, Kane et al. reported that more than 80 percent of companies in the final stages of digital maturity have a consistent and clear digital strategy while only 15 percent of companies in the early stages of digital maturity do.[41] Figure 3 shows the direct link between obtaining a clear digital strategy and the stage of digital maturity.
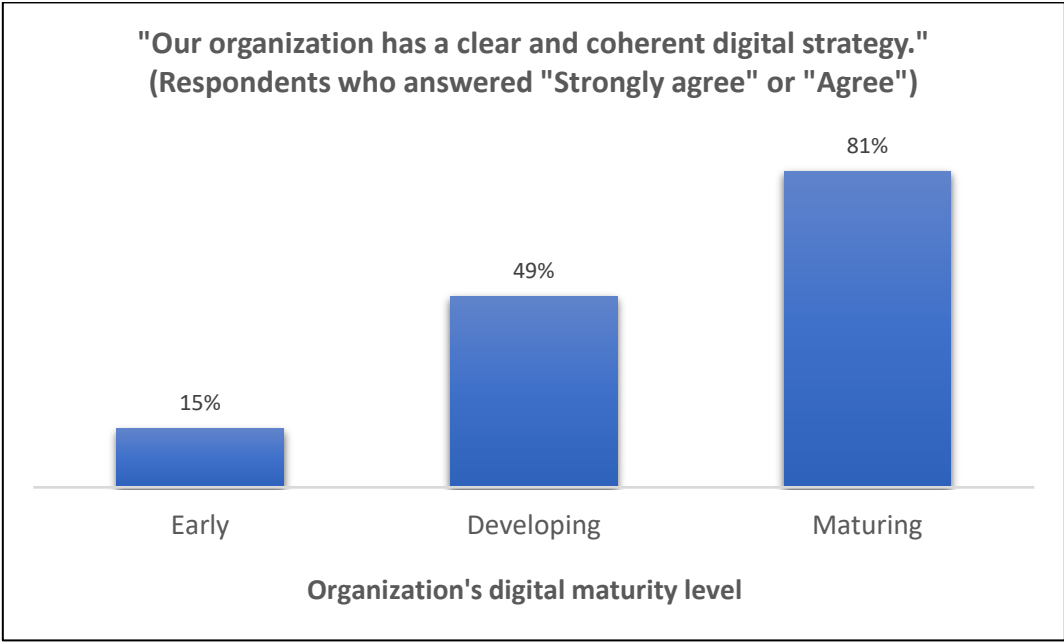

Figure 3: The relation between digital strategy and digital maturity

A thorough digital strategy does not consider technology in an isolated manner but entirely reshapes the organization's relationships with its stakeholders.[42] It is not enough for employee A to enter useful data in a cloud system if employee B does not know how to retrieve it.[43]

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[39] Cf. Daheim, Korn, Wintermann (2017), p. 8
[40] Cf. Gobble (2019), p. 66
[41] Cf. Kane et al. (2015), p. 3
[42] Cf. Gobble (2019), p. 66
[43] Cf. Daheim, Korn, Wintermann (2017), p. 9

Therefore, it is essential for SMEs to be aware of and prepare their employees for the challenges that come with a thorough digital transformation. Firstly, technology – especially virtual reality – requires huge amounts of complex algorithms and computing capacity. This is not only costly in terms of work and time input but also money.[44] Protecting personal and company data as well as identities constitutes another challenge that must be met. Employees are constantly putting sensitive data online by sharing information and knowledge with other colleagues on digital platforms. Lack of control over the knowledge and information shared online and easy access to these systems put cyber security and privacy at risk.[45]

That said, the toughest obstacle remains the resistance of people working with the technology. Due to its power and complexity, virtual reality often seems to create a feeling of discomfort and reserve which complicates the implementation of such sophisticated technologies.[46] However, human resistance does not only apply to new advanced technology trends like virtual reality. A significant part of employees already struggle with using digital communication and collaboration in their daily work lives. Whereas younger employees were raised as digital natives and are used to connect and collaborate with others via technology, the older generation experiences difficulties adapting to digital communication and collaboration. Eblin encourages the connection between digital and non-digital natives in order to stimulate mutual learning. Ultimately, the feasibility of digitalization in the workplace depends on how comfortable employees feel with virtual environments and digital tools and how quickly they can adapt to it.[47]

According to Davis, Richard and Keeton, cultural change can help overcome human resistance and, therefore, is key for the implementation of a digital transformation within a company. Changes in the corporate culture can motivate employees to engage with virtual collaboration tools and embrace the digitalization of communication and collaboration.[48] Cultural change can also reinforce a mindful use of digital tools by promoting opportunities for focus and recovery. Some companies provide meetings free from technology, for example, to prevent multitasking and encourage higher efficiency. This can help employees to feel more

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[44] Cf. Orellana (2017), p. 14
[45] Cf. Soto-Acosta, Cegarra-Navarro (2016), p. 419
[46] Cf. Orellana (2017), p. 14
[47] Cf. Eblin (2012), p. 7
[48] Cf. Davis, Richard, Keeton (2015), p. 56

comfortable with digital transformation and further simplifies its implementation.[49] Managers are key in conveying this embracement for technology and must act as role models in terms of being digital leaders. Creative thinking is one of the main skills that managers must possess in order to structure teams around digitalization and benefit effectively from the insights of technology.[50]

The shift towards a profound digital transformation can only succeed if SMEs consider all these challenges and risks, including the costs for computing capacity, cyber security as well as human resistance, and effectively use cultural change for the implementation. The transformation has to be comprehensive and integrate all components of the company. This demonstrates the urgency with which German SMEs need to develop strategic thrust in order to tackle digitalization and effectively use their advantages to evolve their competitiveness in the digital age.

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[49] Cf. Colbert, Yee, George (2016), pp. 735-736
[50] Cf. Venables (2018)

3. Design Thinking as an Instrument to Develop Strategic Thrust for a Digital Transformation

3.1 Definition of Design Thinking

The fast-moving nature of businesses' external and internal environment demands for innovative and flexible methods to develop strategic thrust. Design thinking serves this demand by identifying and resolving issues creatively and strengthening skills which are required to manage dynamic environments and unclear problems.[51] It is a practical, multi-disciplinary approach to innovation which emphasizes user-centricity, experimentation, collaboration and integrative thinking.[52] While conventional market research procedures usually provide information about explicitly expressed customer needs, the application of design thinking helps to reveal subliminal needs and enhances the comprehension of contexts.[53] The creativity connected with design thinking enables companies to broaden their perspective and think outside the box.

Kurtmollaiev et al. have revealed a positive impact of design thinking training on managerial capabilities of sensing and seizing opportunities as well as a positive indirect correlation between design thinking training and managers' transforming skills. Sensing, seizing and transforming capabilities are crucial for identifying opportunities in the company's internal and external environment and managing change within the business. These findings support the assumption that design thinking is an appropriate instrument for SMEs, which are currently facing the challenges and chances of digitalization, to develop strategic thrust.[54]

Design thinking encompasses a variety of tools tailored to the processes of need finding, ideation, prototyping and visualization.[55] The stage of need finding is mainly based on ethnography which concentrates on establishing an in-depth understanding of users through qualitative research techniques such as observation, customer journey maps or interviews. While ideation employs approaches such as mind mapping, which encourage concept development and brainstorming, prototyping focuses on tools that allow for testing and

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[51] Cf. Kurtmollaiev et al. (2018), pp. 184-185
[52] Cf. Brown (2008), p. 87; Dunne, Martin (2006), p. 516; Kurtmollaiev et al. (2018), p. 184
[53] Cf. Kurtmollaiev et al. (2018), p. 185
[54] Cf. Kurtmollaiev et al. (2018), pp. 194-195
[55] Cf. Liedtka (2014), p. 928

experimentation. Visualization tools are integrated at all stages of the process and emphasize the use of illustration through graphs and charts as well as the presentation of jointly developed ideas on whiteboards or post-it notes.

3.2 The Fictional Business Model "GreenCube"

Even though developing physical products is often regarded as the main objective of design thinking, the method is increasingly employed for transforming more complex and integral systems such as business strategies and business models.[56] In this study, design thinking methods were applied to rethink how German SMEs can leverage the digitalization of communication and collaboration to their advantage. As outlined, German SMEs are recommended to execute a digital transformation, which implies the creation of a new business model. For this purpose, a study group has developed a fictional new business model called GreenCube, tailored to the needs of German SMEs by employing specifically selected design thinking methods.

The creation of GreenCube is founded on an extensive research of the current situation of German SMEs, which is equal to the need finding phase of design thinking. The researchers examined trends such as the GigEconomy, agile working methods or flexible workspaces and their influence on the respective businesses. The findings were then integrated into a design thinking workshop where cross-functional teams covering different research fields defined strategic thrust for German SMEs in the form of the development of a new business model. The cross-functional team constellation in the workshop is attributed to the design thinking tool of design facilitation, which generates a climate conducive to innovation. The following ideation phase consisted of the employment of two distinct design thinking methods: visual communication and "wow" experience. Visual communication simplifies the decision-making process by transmitting messages in an easy, concise and creative manner.[57] This method was adopted when conclusions about the current situation of German SMEs in terms of pains, needs and gains were written down on sheets of paper and spread on the floor. The visualization eased the blending of new ideas and enriched the creativity of the researchers for the concept development. The "wow" experience produces a different dimension of

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[56] Cf. Kurtmollaiev et al. (2018), p. 186
[57] Cf. ibid., p. 187

experience and promotes change of perspective.[58] It was applied when generated concept ideas derived from the conclusions of the previous step were displayed on flip charts. New insights were drawn from the expressive presentation of the draft, which contributed to the refinement of the concept.

The elaborated concept serves as a fictional solution for the implementation of a digital transformation for German SMEs. GreenCube represents a flexible workspace suited for rural areas in the form of a modern, cube-shaped glass building which provides employees of German SMEs the possibility to work remotely and use the variety of digital tools offered within the premises. Using the facilities at GreenCube instead of working at the local offices of the participating companies changes the whole nature of how SMEs collaborate and communicate internally.

The name GreenCube is rooted in the sustainable "zero-waste" construction of the building as well as its location in rural, natural areas. Combined with the promotion of employees' work-life-balance through offering after-hour events, flexible working hours or day care for children, for example, these concept features raise the reputation of companies that offer their employees workspaces at GreenCube. This, in turn, automatically enhances the firms' employer branding.

That said, the core of the digital transformation is mainly realized by the simplified application of digital technologies for improved collaboration and communication as well as the creation of networking opportunities with other SMEs. The integration of digital tools in the flexible workspace is ensured by offering technical hardware including laptops, beamers and phones, as well as high-speed internet and videoconferencing rooms. These technologies are installed with specific teamwork and messaging software, which initiates the introduction of a unified and central collaboration and communication hub within the SMEs. The offering of technical hardware and software especially resolves current productivity issues of social technologies. However, it does not yet add further value to the use of this new business model. In order to guide SMEs through the effective utilization of digital technology, experienced information technology consultants provide on-site assistance and advise the respective SMEs on how to advance their digital transformation. The key benefit for investing SMEs is primarily related to

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[58] Cf. Kurtmollaiev et al. (2018), p. 187

the synergies they can create by linking their data and ideas with other SMEs. Working alongside employees of various firms and participating in idea-sharing events at GreenCube encourages employees from distinct companies to collaborate and establish innovative partnerships. These partnerships can ultimately contribute to the building of entire ecosystems, which have been found to be the most effective form of a digital transformation.

3.3 Challenges of Design Thinking

Besides the potential to develop strategic thrust in an innovative way, as exemplified by GreenCube, design thinking also involves several challenges. Companies especially face difficulties in realizing the generated concepts because the ideas exceed the future product scope specified in their product planning.[59] Transferring this aspect to the employment of design thinking for creating new business models, firms struggle with the limitation set by pre-defined goals with respect to the BMI. In order to overcome their own limitations, Story et al. suggest that companies need to learn how to break out of the patterns that bind them to their current setting. This ability is based less on the capability to think radically and more on the capability to deal with discontinuity.[60]

Another challenge for the successful application of design thinking methods is managing the conflict between the emphasis on experimentation and the emphasis on short-term profits and time reduction.[61] A correct and sustainable use of design thinking methods usually requires an intensive workshop, which can last between one and four days depending on the objectives. GreenCube was developed during a two-day workshop in which only a fictional concept without any concrete implementation measures was drafted.

In addition, the contributions and profits of design thinking methods are difficult to measure and assess. This difficulty is particularly pronounced when the time until market launch is very long and when the value can only be quantified through return on investment.[62] Companies often apply traditional evaluation systems, such as key performance indicators, to evaluate

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[59] Cf. Carlgren, Elmquist, Rauth (2016), p. 352
[60] Cf. Story et al. (2014), p. 6
[61] Cf. Bessant, Öberg, Trifilova (2014), p. 1285
[62] Cf. Carlgren, Elmquist, Rauth (2016), pp. 352-353

the contribution of design thinking activities. However, these methods do not always match the intentions of design thinking initiatives.[63]

Due to the costs of resources and time, these challenges especially apply to the introduction of a new business model. However, the roll-out of a new business model is always associated with a certain level of risk. For this reason, a digital transformation, which at its core involves a BMI, requires a risk-taking corporate culture.[64] Giving employees freedom to experiment instead of uncompromisingly complying with processes and rules is a crucial aspect of a risk-seeking culture. If the top-management fears losing control and does not allow employees to take initiative, the company is unlikely to rethink diverse approaches to working.[65]

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[63] Cf. Carlgren, Elmquist, Rauth (2016), p. 353
[64] Cf. Weisbender (2019), p. 14
[65] Cf. McConnell (2015), p. 4

4. Conclusion

Despite the various productivity gains, the use of social technologies is no longer sufficient to maintain the competitiveness of German SMEs in today's markets. The digital age requires not only a digitalization of collaboration and communication, but also the implementation of a digital transformation, which at its core consists of the creation of a new business model. The alignment of the new business model to the integration within an ecosystem is a valuable approach for the transformation, as it allows for the exploitation of the resulting synergies.

The paper found that design thinking methods can help German SMEs to develop strategic thrust for a digital transformation. The potential of design thinking is primarily rooted in the ability to creatively solve problems and reinforce skills necessary to address dynamic environments. While the paper focuses on investigating the usefulness of design thinking for developing strategic thrust, the elaboration of the practical implementation of a digital transformation as well as the integration in an ecosystem is kept concise. A digital transformation is a complex process involving various aspects of organizational change which were not examined individually in this paper. These include, for example, the formulation and realization of a digital strategy and the corresponding adaptation of the corporate culture. This thesis concentrates primarily on the BMI, which is considered to be the core element of a digital transformation.

A concrete example of a digital transformation derived from applying design thinking methods is presented with the fictional concept GreenCube. The concept is targeted at German SMEs which are currently facing digital transformation by simplifying the incorporation of sophisticated digital technologies and providing networking opportunities and thus integration into an ecosystem.

Nevertheless, the paper has identified three main challenges of design thinking activities that limit its potential. These include the incongruence of pre-defined specifications and designed concepts, the gap between a focus on time-reduction and a focus on experimentation, and the lack of measurability of design thinking gains. These difficulties are particularly prevalent when introducing a new business model.

Returning to Charles Darwin's interpretation of survival, design thinking methods equip companies with the necessary abilities to quickly adapt to changes in the external environment. While digitalization remains the primary driver for the development of the economy, other related factors, such as rapidly changing customer needs or the growing number of disruptive innovations, call for just as much adaptability. Operational flexibility, the ability to manage change and agility will increasingly determine whether a business flourishes or vanishes in the digital age. The requirement for companies to take action sooner rather than later is becoming ever more urgent and a digital transformation is needed to conform to this fast-moving world.

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References of Figures

Figure 1:   **STATISTA**, Collaboration software market size worldwide 2015-2022, 2019. Retrieved on 29 April 2019 from https://www.statista.com/statistics/590412/ worldwide-collaborationsoftware-market/

Figure 2:   Own graphic based on **SALDANHA, T.,** The Stages of Digital Transformation, in: EContent, Vol. 42, No. 4, 2019, pp. 20-21.

Figure 3:   Own graphic based on **KANE, G. C., PALMER, D., PHILLIPS, A. N., KIRON, D. AND BUCKLEY, N.,** Strategy, Not Technology, Drives Digital Transformation, in: MIT Sloan Management Review and Deloitte University Press, 2015.

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