

Digitization in the Covid-19 crisis – Opportunities and Barriers for SMEs

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Abstract. Digitization is one of the most important driving forces within companies, as new business models develop from recent digitization processes. Especially in times of the Covid-19 crisis, it is important that small- and medium sized companies focus on digital processes. The purpose of this paper is to find out what opportunities and barriers arise for small- and medium sized companies through the crisis. The following information in this paper is based on an empirical, qualitative research and therefore expert interviews were conducted. After the transcription, the interviews were evaluated by using Grounded Theory. The Grounded Theory is a method that is particularly suitable for identifying new and unknown relationships. In the context of this paper, the aim is to analyze the main drivers of the digitization influenced by the Covid-19 crisis in SMEs.

Keywords: Digitization, Digital Transformation, Pandemic, Covid-19 crisis, Digital Business models, Opportunities, Barriers, SMEs

1 Introduction

In today's world, there are major changes in technology that have consequences on the whole society. In addition, the development and introduction of new technologies have an impact on digitization, which can have a major effect on small and medium-sized enterprises. There are several meanings for the term digitization, while a general definition cannot be found in the literature. A definition of the term digitization is "the transformation of analogue content or processes into a digital form or mode of operation" (1). Probably the most common meaning of digitization is the digital turnaround (2). The term digitization is also associated with the digital revolution, digital transformation and Industry 4.0 (3). Furthermore, the degree of digitization in small and medium-sized enterprises compared to large corporations differs. It can be noted that the pandemic is hitting small and medium-sized companies much harder than large corporations (4). A shutdown or a decrease in the turnover hits SMEs harder than corporate groups. This can be justified by the lower resources in form of monetary reserves or personnel. In addition, just over half of the enterprises decide to adopt a new business model in order to be able to remain in the market at all (5).

In times of the crisis, companies have to be innovative and adapt to the new circumstances. This is why companies in the current situation prefer the so-called "start-up flair", which is characterized by rapid changes of direction, experiments or even col-

laborations (4). Since the beginning of the crisis, many companies had to go into bankruptcy because the virus affects the global economic framework. Companies, especially small- and medium-sized enterprises, are able to reopen their offices if they are observing health protection guidelines.

In order to get a better understanding of the connection between digitization and the Covid-19 crisis in small and medium-sized enterprises, expert interviews with various companies were conducted.

2 Methodology

The following section explains the research design of this study and the methodology that was used for collecting and analyzing the interview data to find opportunities and barriers of the digitization during the Covid-19 crisis for SMEs. The potential use of digitization can be defined as the individual perceived capability of the implementation of digitization technologies (6).

2.1 Literature Research

The starting point for addressing the issue of possible opportunities for SMEs during the Covid-19 crisis with regard to digitization was a systematic literature research. After the authors had gained an overview of possibilities, a list of further literature was made. As a limitation, the authors decided to consider only articles from at least B-rated journals from 2013 onwards. The authors preferred articles from A+ and A-rated journals but decided to consider B-rated journals as well, since small and medium-sized companies are standing in the focus.

2.2 Research Design

After conducting a systematic literature research, the decision had to be made which research method would fit best to the above-mentioned topic. The choice was made to use qualitative expert interviews, because the core of this research is more practical. The research design is based on the methodology of Grounded Theory by Glaser (7).

According to Glaser and Laudel, qualitative interviews are interviews with people who have special insights due to their position in the workplace. The aim of expert interviews is to explore facts through questioning. These respondents have special knowledge on these topics. By interviewing the experts, new knowledge about the relevant facts will be gained. Expert interviews are a method to gain experiences about specific facts (8).

The authors carried out a literature research. This is the starting point for a guideline-based interview. Interviews that are conducted with the help of a guideline are a kind of non-standardized interview and consist, for example, of a collection of open ques-

tions that form the basis of the interview. This type is particularly suitable when several topics have to be covered (8).

2.3 Research Setting

At the beginning the experts are selected according to content criteria. It represents an essential aspect of the research design, so it is necessary to justify the selection. The selection of experts is plausible if it answers the following three questions (9).

In order to find suitable experts, it is useful to consider who has relevant information and who is able to provide this information. Furthermore, it is important that the experts are available on demand (8).

The key to successful qualitative expert interviews is the development of a stringent questionnaire. It is characterized by the two main topics digitization and the Covid-19 crisis. First, the interview starts with an icebreaker to provide the interviewee with further relevant information of the topic. The first part contains questions about digitization. Within this section, the aim is to find out what importance the company attaches to digitization. In this context it is also relevant to identify what barriers and opportunities the company associates with digitization. The second part of the questionnaire deals with the Covid-19 crisis. In the beginning the impact of the crisis on companies will be examined. The following questions have the purpose to find out what possibilities or opportunities the company sees in this major economic crisis with the help of digital technology and how it intends to achieve it. The interview ends with questions on age, gender, work position, industry and number of employees. If there is still time left, the interview can be finished by additional thoughts of the respondents.

2.4 Data Collection

This study is based on ten interviews, which were conducted in several companies and focused on the opportunities and barriers for SMEs in times of the Covid-19 crisis. Before the interviews were conducted, the authors performed pretests. These tests were intended to prevent possible mistakes or ambiguities. As a result, it was possible to establish that there were no ambiguities in the questionnaire. Subsequently, the appropriate interviews were conducted in the companies. An interview took around 30 minutes on average, was digitally recorded and then transcribed in the original language. The decision was made to use semi-structured interviews, because on the one hand they allow comparisons through consistent questions and on the other hand they give the expert space for individual ideas. This guarantees a methodical analysis and at the same time ensures that the interviewee is willing to participate in the interview.

It is essential that there are clear guidelines about which group of experts should be selected. As the study focuses on small and medium-sized enterprises, the selected experts were people who are currently working in a company in Germany with about 40 to 3,000 employees and are operating on the management level. The authors have deliberately chosen companies from different industries, because the Covid-19 crisis

affects everyone. This ensures that opportunities and barriers for SMEs during the Covid-19 crisis can be found, which could be an option for the majority of companies. In the following table, all interviews with the listed companies and persons are illustrated. For data privacy reasons, a pseudonymisation of the experts was made.

Pseudonym	Industry	Size (employees)	Position	Age	Gender	Duration of Employment	Current Position	Education
AMBA GmbH	Agency of Digital Marketing	55	Junior Marketing Manager	26	Female	1 Year 9 Month	1 year	Master of Arts
Bentel Hotel	Hotel Industry	80	CEO	53	Female	27 years	27 years	Diploma
DaRu-GmbH	Automotive Supplier	2050	Supplier Auditor	30	Male	3 years	3 years	Technician and business economist
Energy BW GmbH	Energy Consultant	2700	Marketing Manager (E-Mobility)	26	Female	1 year	1 year	Master of Science
MediTec GbR	Medical Technology	2900	Technical Support, Field Service	25	Male	1 year	1 year	Bachelor of Science
PeTe-GmbH	Interior Designer	130	CEO	55	Male	22 years	20 years	Carpenter master
Plug-In GmbH	Mechanical Engineering	330	Product Manager	27	Male	8 years	5 years	Master of Engineering
Staussinger GmbH	Steel Construction	85	Technical Sales and Distribution	24	Male	2,5 years	2,5 years	Fachwirt (IHK)
Wire GmbH	Automotive Supplier	40	CEO	58	Male	30 years	18 years	Diploma (Textile. Ing. FH)
Witze KG	Metalworking Industry	3000	Strategic Purchaser	27	Male	2,5 years	2 years	Master of Science

Fig. 1. Interviewed experts and companies

2.5 Data Analysis

Based on the Grounded Theory, the first step of the data analysis is an open coding. As a result, audio recordings can be converted into a text format. To make the sentences more understandable, individual words were added and broken half-sentences were deleted.

During the coding process, a content-related label is assigned to each passage. The generation of the codes is based on the experts' choice of words. The second step is called selective or axial coding. It is used to find present connections and conflicts within the codes. In the next step, the descriptive codes are broken down, i.e. thematically matching codes are assigned to superordinate categories. The building of the superordinate categories is based on a systematic comparative analysis of all interviews.

In the best-case scenario, based on the interviews, key aspects will be identified, showing the possibilities of digitization, so that SMEs can generate new opportunities during this crisis. These key aspects will be used to form hypotheses. These hypotheses are finally developed into a hypothesis model.

3 Results

The qualitative study focuses primarily on the current Covid-19 crisis and how it affects digital processes in small- and medium sized companies. Consequently, in total three main drivers were identified which are influenced by the Covid-19 crisis. The main drivers, that have been analyzed are Efficiency, IT and Changed behavior. For each specific driver, linked items were identified which have a direct impact. A total of seven different aspects were analyzed, resulting in opportunities or barriers with regard to digitization in the Covid-19 crisis for SMEs. Figure 2 illustrates the hypothesis model.

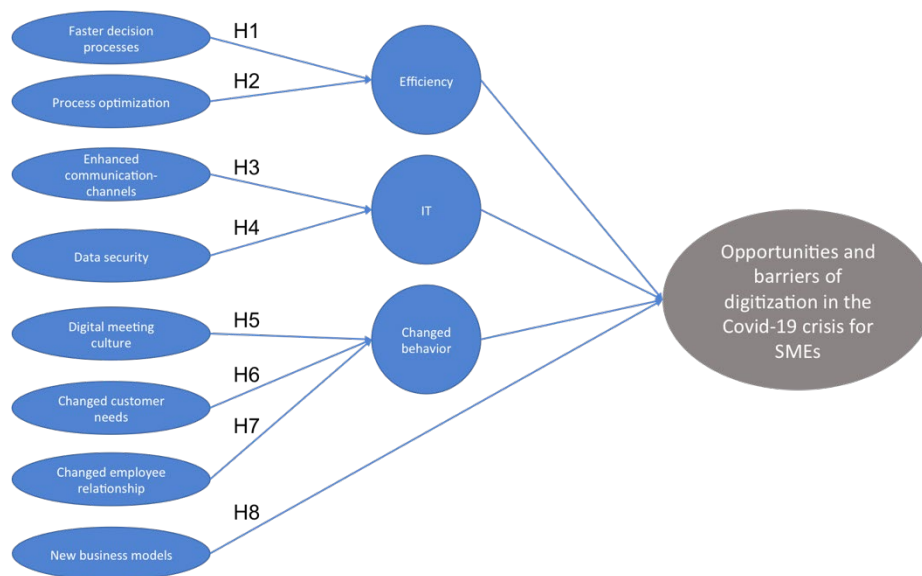


Fig. 2. Hypothesis model

3.1 Efficiency

Efficiency is generally defined as a measure of resource efficiency (10). Thus, this term can be used to determine the effectiveness and profitability of various production factors. In the context of digitization and in consideration of the Covid-19 crisis, faster decision-making processes as well as process optimizations are subsequently seen as drivers for more efficient working methods in companies. The results of the conducted qualitative study prove this and will be presented in the following sections.

Faster decision processes

The structures in small and medium-sized enterprises through flat hierarchies result in faster implementation of decisions than in big companies.

Faster processes in general also imply faster decision paths and thus time-optimized decision-making processes (11).

Plug-In GmbH: *“I actually believe that the decision-making process has become shorter because I have a good contact to my boss due to digital video meetings.”*

AMBA GmbH: *“The lines of communication are shorter, you can get answers faster (...).”*

By forming virtual teams, the individual team members are well networked. In addition, the connection to the supervisor is more direct, because it may not be necessary to overcome spatial distances, but all persons can be reached equally well in virtual space (12).

Plug-In GmbH: *“When I have 100 people, it's just not as big a volume as all of a sudden all the employees from a huge company go to the home office and then have a problem with the data load. This was new for us and I think that differs to a small company. I think a small company can be more flexible”.*

In virtual rooms, the inhibition threshold to address problems is also lowered and thus to demand a decision in the form of countermeasures by the manager (13).

Projected onto the home office needs created by Covid-19, it is apparent that SMEs were able to react much more dynamically and mastered the challenge more quickly. There is a clear difference in terms of organizational effort whether ten employees have home office at the same time or 100 (13). Due to the fact that in SMEs the employees often know each other personally, contact points for obtaining permits are well known. In addition, open questions can be clarified in a more targeted manner. In corporate groups, contact is more impersonal (13).

H1: Thanks to short decision-making processes, SMEs are quicker to act and more agile.

Process Optimization

In the context of digitization, software solutions represent possibilities to make processes more comprehensible and to simplify them. Traceability makes it easier for individual business areas to quickly access facts and gain an overview of specific topics (14). In literature the digitization is defined „as the material process of converting analog streams of information into digital bits“ (15). This definition underlines the following statement by the experts, who also see digitization as a kind of conversion of analogue processes to digital units.

PeTe GmbH: *“We have a holistic ERP landscape within the company, all work processes and all control processes are managed by it, which means that all products*

and all processes are digitally controlled and digitally managed from the order placement to the completion and delivery.”

An increased performance volume or savings in personnel due to digitization can be observed in several company divisions (16). Using the HR department as an example, a study was carried out by Zhou and Guangjian in “The impact of HRM digitization on firm performance: investigating three-way interactions” which examined the relationship between the interaction of HRM digitization is positively related to firm performance. In addition, the relationship among the employees is strengthened by the strategic and business cooperation (17).

The findings of the listed study can be confirmed by the following quotation from corporate practice:

Wire GmbH: *“Well, we introduced an ERP system a few years ago and we see of course that some processes can be done automatically. It saves on personnel. It simplifies the work.”*

H2: In SMEs, software solutions offer the opportunity for faster work and process optimization.

3.2 Information Technology

The IT includes all technologies for processing, using and storing information. Furthermore, it builds the basis of the digital economy (18). In addition, the IT is increasingly influencing our private and professional lives. Information technology is the generic term for hardware, software and digital services (19). Hardware contains servers and personal computers such as mobile devices, printers as well as network components. Software includes all application programs for tablets, smartphones and computers. IT services include services such as installation, consulting, maintenance and cloud services.(18)

Enhanced communication-channels

For the IT sector, there is the possibility that communication channels can be enhanced. This means that companies were forced to find new communication channels during the crisis. 60 percent of the interviewees stated that the new communication channels have a surprisingly positive effect on their companies. On the one hand, the new communication channels can save costs and time because it is no longer necessary to travel to the customers. In addition, the new communication channels can also strengthen the relationship with the customers. The following quotes confirm this hypothesis:

Plug-In GmbH: *“At the moment I am talking to a lot of customers and we often use the new program Skype. Everyone is impressed by this program and finds it very easy*

to use. I notice that I talk to the customers much more and the personal relationship has also improved.”

Wire GmbH: *“Since the crisis, we have been using programs like Skype or Zoom increasingly. The advantage of these digital communication channels is that you only have a short time to communicate and to receive information. Also, you can save travel costs because you don't have to drive to the customer.”*

The improved communication channels result in a simpler and clearer communication.

AMBA GmbH: *“The ways of communication are shorter, you can get answers faster, you can google things and find answers to questions.”*

Home Office has found its way into companies at the latest through Covid-19. Due to contact restrictions, companies and employees were forced to work from home and communicate accordingly (20). Simpler and faster communication channels are a side effect of digitization (12). However, they were only fully exploited by the circumstances described above. Through communication via virtual communication instruments such as Zoom or Skype it is possible to exchange data quickly. There is a short time frame between question and respond. In addition, upcoming business trips can be saved by holding virtual meetings (12). However, it must always be specifically checked with which partners or employees is communicated. For well-rehearsed teams, virtual communication represents the best way of communication. For new customers, who are not known before and possibly have a different cultural background, it is advisable to plan face to face meetings to avoid misunderstandings (21).

H3: Due to digitization the way of communication gets simplified.

Data security

The topic of data security has played a major role since the beginning of digitization. One of the most significant challenges of digitization is the development of business models and technologies that enables the secure use of the customers' data (22). The study has revealed that 80 percent of the respondents think, that data security is one of the main barriers of digitization. The experts are mainly afraid of hacker attacks or the abuse of their private data. If digitization will be lived and scaled to the full extent from a company's point of view, the IT infrastructure must always be state-of-the-art in terms of data security.

Energy BW GmbH: *“In my opinion the data security is a very important aspect. Many employees are afraid of hacker attacks and that their private data will be used by other people.”*

DaRu GmbH: *“Due to a hacker attack we had to stop our production last year and had very high costs as a consequence.”*

AMBA GmbH: *“At the same time I know that digitization creates some risks. For example, it is possible to get hacked or private information reach the wrong people.”*

H4: Data security is one of the main risk factors of digitization for SMEs.

3.3 Changed behavior

The Covid-19 crisis has affected the foundations of our social and economic relations, indefinitely. Due to contact limitations and exit restrictions, people all over the world have to change their behavior and whole lifestyle drastically (23).

But also, companies must adapt to the new circumstances to stay competitive and successful.

Digital meeting culture

The first impact factor of the changed behavior is characterized by the digital meeting culture. 60 percent of the experts mentioned that the meeting culture has changed considerably during the Covid-19 crisis. As the number of online meetings increases, business trips can be reduced, which leads to cost and time savings (24). The following quotations of the experts demonstrate the relevance of this factor.

Energy BW GmbH: *“Right now, there are more digital processes and meetings that are held only virtually. Digital meetings will therefore increase in the future and that is why the meeting culture will change significantly.”*

Eugen Gayer GmbH: *“The crisis is raising the awareness of digitization and aspects such as online meetings are becoming more important.”*

H5: The Covid-19 crisis leads to a changed meeting culture.

Changed customer needs

During the crisis, small- and medium sized companies have to pay more attention to the needs of their customers. Especially for the sales department it is important to find new opportunities to communicate with the customers (25). Due to behavior restrictions, the personal contact is only possible to a limited extent and therefore new digital communication channels become more relevant. 78 percent of the experts mentioned that they have to deal more intensively with their customers during the crisis.

PeTe GmbH: *“Due to the crisis, our customers prefer to talk to us more often via new communication channels. In the last few months, we have done this more often via video conferencing tools or new technologies such as virtual reality.”*

AMBA GmbH: *“I believe that we can grow through the crisis and also have great opportunities for the future. We have been able to develop a completely different and much closer contact with our customers.”*

The experts concretized the changed needs of the customers in a more sensitive handling of prices or Incoterms. However, the highest priority is given to the maintenance of relationships.

H6: Due to the Covid-19 crisis, SMEs are forced to focus more on customer needs.

Changed employee relationship

The approach to communication interaction is subjected to change today. Globalisation is leading to the relocation of many production sites abroad, which is also changing the geographical location of many workers' jobs. This leads to an increased mobility of workers, who are sufficiently networked in every country of the world to be able to meet the demands of the job in the context of geographically distributed teams (26).

Bentel Hotel: *“It becomes more difficult to establish a personal relationship among colleagues.”*

Plug-In GmbH: *“Since the crisis I am working more with programs like zoom. So I do not see my colleagues in real life anymore. I notice that I am losing the personal contact.”*

To bridge the geographical differences and remain an interactive work experience, virtual communication channels must be used. This leads to less informal discussions among colleagues, which are important for building trust and relationships between them. The virtual communication tools make the contacts more impersonal (27). These factors increase anonymity and the feeling of isolation, which makes integration into the team more difficult (28). Virtual communication takes place via computer-supported communication channels such as video conferences. In times of the Corona crisis, it is increasingly the case that individual team members are geographically distributed through home office activities and therefore have to fall back on virtual communication opportunities.

MediTec GbR: *“So unfortunately I see my colleagues even less.”*

The bond to the team and to other work colleagues is lost, which changes the relationship of the employees. This is characterised by a superficiality and is increasingly based solely on business (29).

H7: Digital communication has a negative impact on the relationship between employees.

3.4 New Business Models

The digital transformation is leading to fundamental changes in the markets. Nowadays, it is important that companies optimize their business models in order to remain successful and competitive. Due to the Covid-19 crisis, some companies have been forced to change their business models which may create opportunities for the future (30).

The qualitative study has revealed that 90 percent of the experts believe that new business models are emerging as a result of the Covid-19 crisis. Due to the crisis, small- and medium sized companies are more dependent on digital technologies and have been dealing with them more intensively in the last few months. This generate opportunities for the use of new software programs.

Eugen Gayer GmbH: *“I would say that our company has raised awareness of digitization. New programs were implemented (...).”*

Bentel Hotel: *“Nevertheless, we can learn from the crisis and improve our processes in the hotel. We have much more time to discuss new concepts and launch new programs.”*

H8: Short term developments during the Covid-19 crisis can open up new business models.

4 Conclusion

The following recommendations for small and medium-sized enterprises can be derived from the results (see chapter three). Digitization enables numerous opportunities, but as the hypotheses above show, barriers as well. In effect of Covid-19 the study identifies three main drives including chances and risks of digitizing processes in SMEs.

By using the Grounded Theory for data evaluation, a model was developed which is supposed to disclose the opportunities and barriers of digitization. According to this project, a semi-structured interview guide was designed to collect empirical data from experts.

As a result of the coding, three main drivers were identified in correlation to the topic: Efficiency, IT, and Behavior changes. In the context of efficiency, the experts reported of the benefits of faster decision processes caused by flat hierarchies in SMEs. Another positive aspect is the reduction of costs. This circumstance is caused by digital alternatives and process optimizations.

Based on the IT section, experts reported of the possibility to enhance their communication channels by using digital processes. In this context, data security was highly weighted by some experts too. On this occasion, handling data was identified as a risk and needs to be secured carefully.

The behavior of customers and employees seems to be affected by digitization measures and need to be adapt to digital meeting cultures. Furthermore, the study

identifies changing needs on customer-side and transform operational relationships on side of the employees.

The coding shows the opportunity of developing and joining new business models in connection with the digitization. Experts identify the chance to expand their business model and to adapt new business ideas for the future.

Consequently, digitization accords to a lot of opportunities in the Covid-19 crisis. The study shows that the implementation of digital methods and services lead to dependencies, which are accompanied by certain risks. For this reason, the topic was complemented by “barriers” to reveal both sides in the context of the subject.

5 Limitations & Further Research

Even though the study reveals many aspects of digitization in its context, various limitations must be explained. The study was conducted with experts of different companies. In order to gain deeper insights, it would be useful to interview several experts of the same company from different departments and teams to compare their statements and to be able to examine the effects more closely.

Overall, ten experts were interviewed within the framework of this qualitative study. Thus, it is not possible to speak of representative results, especially because the design of the study is influenced by the subjectivity of the participating experts. To consolidate the results, a quantitative study should be instrumented. Furthermore, it is recommendable to provide a continuous analysis of this subject because digitization is a fast running process with steady innovations and changing application scenarios in short-term intervals.

The results and recommendations of this study are directed to medium-sized companies with 40 - 3000 employees. In this case the empirical research results are limited and not transferable to smaller companies and larger corporations.

Summarized, the use of digitization, in the context of the Covid-19 crisis, is essential. Digitization can profitably change and expand processes and business models in order to make medium-sized companies sustainable.

Based on the findings of the conducted study, the opportunities must be exhausted, and the barriers treated with a certain sensitivity in order to be able to profit sustainably from the potentials of the digitization.

References

1. TARKOWSKI, P. Digitalisierung: Was ist das? Eine Definition. | dm [online]. *CLICKHERO GmbH*, 28. Februar 2018 [Zugriff am: 27. Juli 2020]. Verfügbar unter: <https://digital-magazin.de/digitalisierung-definition>
2. BENDEL, O. *350 Keywords Digitalisierung*. Wiesbaden: Springer Fachmedien Wiesbaden, 2019. ISBN 978-3-658-25822-1.
3. DECKERT, R. *Digitalisierung und Industrie 4.0. Technologischer Wandel und individuelle Weiterentwicklung*. Wiesbaden: Springer Gabler, 2019. essentials. ISBN 978-3-658-23846-9.
4. WIRTSCHAFT UND ENERGIE, BUNDESMINISTERIUM FÜR. *Informationen für kleine, mittlere und große Unternehmen* [online]. 28 Juli 2020 [Zugriff am: 28. Juli 2020]. Verfügbar unter: <https://www.bmwi.de/Redaktion/DE/Coronavirus/kleine-mittlere-grosse-unternehmen.html>
5. BULUT, E. COVID-19: Wissenswerte Informationen für Start-ups [online]. *Digitaler Hub Region Bonn AG*, 6. April 2020 [Zugriff am: 27. Juli 2020]. Verfügbar unter: <https://www.digitalhub.de/covid-19-wissenswerte-informationen-fuer-start-ups/>
6. CELESTI, A. und P. LEITNER. *Advances in service-oriented and cloud computing. Workshops of ESOC 2015, Taormina, Italy, September 15-17, 2015 : revised selected papers*. Switzerland: Springer, 2016. Communications in computer and information science. 567. ISBN 978-3-319-33312-0.
7. ALTER, S. und R. WRIGHT. Validating Work System Principles for Use in Systems Analysis and Design [online]. *ICIS 2010 Proceedings*, 2010. Verfügbar unter: https://aisel.aisnet.org/icis2010_submissions/197
8. GLÄSER, J. und G. LAUDEL. *Experteninterviews und qualitative Inhaltsanalyse als Instrumente rekonstruierender Untersuchungen*. 4. Auflage. Wiesbaden: VS Verlag, 2010. Lehrbuch. ISBN 9783531172385.
9. KAISER, R. *Qualitative Experteninterviews. Konzeptionelle Grundlagen und praktische Durchführung*. Wiesbaden: Springer VS, 2014. Lehrbuch. ISBN 9783658024789.
10. POLUHA, R.G. *Anwendung des SCOR-Modells zur Analyse der Supply Chain. Explorative empirische Untersuchung von Unternehmen aus Europa, Nordamerika und Asien*. Zugl.: Köln, Univ., Diss., 2005 u.d.T.: Poluha, Rolf G.: Analyse der Supply Chain von Unternehmen mittels des Supply Chain Operations Reference (SCOR)-Modells - explorative empirische Untersuchung des SCOR-Modells des Supply-Chain Council zur Analyse von Supply Chain-Prozessen. 5., überarb. Aufl. Lohmar: Eul, 2010. Reihe. 50. ISBN 9783899369687.
11. BÜHRER, C. und C. HAGIST. The Effect of Digitalization on the Labor Market. In: H. ELLERMANN, P. KREUTTER und W. MESSNER, Hg. *The Palgrave Handbook of Managing Continuous Business Transformation*. London: Palgrave Macmillan UK, 2017, S. 115-137. ISBN 978-1-137-60228-2.
12. LINDEBLAD, P.A., Y. VOYTENKO, O. MONT und P. ARNFALK. Organisational effects of virtual meetings [online]. *Journal of Cleaner Production*, 2016,

- 123, 113-123. ISSN 0959-6526. Verfügbar unter:
doi:10.1016/j.jclepro.2015.08.058
13. D'ANNA, G., F. D'ARCO und J. VAN GOETHEM. Virtual meetings: a temporary choice or an effective opportunity for the future? [online]. *Neuroradiology*, 2020, **62**(7), 769-770. ISSN 1432-1920. Verfügbar unter: doi:10.1007/s00234-020-02461-5
 14. HOLMSTRÖM, J., M. HOLWEG, B. LAWSON, F.K. PIL und S.M. WAGNER. The digitalization of operations and supply chain management: Theoretical and methodological implications [online]. *Journal of Operations Management*, 2019, **65**(8), 728-734. ISSN 0272-6963. Verfügbar unter: doi:10.1002/joom.1073
 15. J. SCOTT BRENNEN und DANIEL KREISS. Digitalization. In: *The International Encyclopedia of Communication Theory and Philosophy*: American Cancer Society, 2016, S. 1-11.
 16. TRUM, C. Realizing the Benefits of Digitalization Through Standards [online]. *Natural Gas & Electricity*, 2020, **36**(7), 9-17. ISSN 1545-7907. Verfügbar unter: doi:10.1002/gas.22157
 17. ZHOU, Y., G. LIU, X. CHANG und L. WANG. The impact of HRM digitalization on firm performance: investigating three-way interactions [online]. *Asia Pacific Journal of Human Resources*, 2020. ISSN 10384111. Verfügbar unter: doi:10.1111/1744-7941.12258
 18. ANDERSSON, H. und P. TUDDENHAM. Reinventing IT to support digitization [online]. *McKinsey & Company*, 1. Mai 2014 [Zugriff am: 27. Juli 2020]. Verfügbar unter: <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/reinventing-it-to-support-digitization>
 19. NISSEN, V., Hg. *Digital transformation of the consulting industry. Extending the traditional delivery model*. Cham, Switzerland: Springer, 2018. Progress in IS. ISBN 978-3-319-70490-6.
 20. PORPIGLIA, F., E. CHECCUCCI, R. AUTORINO, D. AMPARORE, M.R. COOPERBERG, V. FICARRA und G. NOVARA. Traditional and Virtual Congress Meetings During the COVID-19 Pandemic and the Post-COVID-19 Era: Is it Time to Change the Paradigm? [online]. *European Urology*, 2020. ISSN 0302-2838. Verfügbar unter: doi:10.1016/j.eururo.2020.04.018
 21. LAITINEN, K. und M. VALO. Meanings of communication technology in virtual team meetings: Framing technology-related interaction [online]. *International Journal of Human-Computer Studies*, 2018, **111**, 12-22. ISSN 1071-5819. Verfügbar unter: doi:10.1016/j.ijhcs.2017.10.012
 22. *Accenture | Israel | New Applied Now* [online]. 28 Juli 2020 [Zugriff am: 28. Juli 2020]. Verfügbar unter: <https://www.accenture.com/il-en>
 23. *Study: Impact of COVID-19 on consumer behavior* [online]. 27 Juli 2020 [Zugriff am: 27. Juli 2020]. Verfügbar unter: <https://www2.deloitte.com/de/de/pages/consumer-business/articles/consumer-behavior-study-covid-19.html#>
 24. RUBINGER, L., A. GAZENDAM, S. EKHTIARI, N. NUCCI, A. PAYNE, H. JOHAL, V. KHANDUJA und M. BHANDARI. Maximizing virtual meetings

- and conferences: a review of best practices. *International Orthopaedics*, 2020, **44**(8), 1461-1466. ISSN 1432-5195.
25. HENRIQUES, R. EDP Comercial: Sales and Service Digitization. In: L. REINKEMEYER, Hg. *Process mining in action. Principles, use cases and outlook*. Cham: Springer International Publishing, 2020, S. 109-118. ISBN 978-3-030-40172-6.
 26. E. M. AKHMETSHIN, I. A. ILYINA, V. V. KULIBANOVA und T. R. TEOR. "Employee Engagement" Management Facilitates the Recovery from Crisis Situations. In: *2019 Communication Strategies in Digital Society Workshop (ComSDS)*, 2019, S. 50-55.
 27. O'LEARY, M.B. und J.N. CUMMINGS. *The Spatial, Temporal, and Configurational Characteristics of Geographic Dispersion in Teams*, 2007.
 28. HERTEL, G. und U. KONRADT. *Management virtueller Teams. Von der Telearbeit zum virtuellen Unternehmen*. Weinheim und Basel: Beltz Verlag, 2002. ISBN ISBN 3-407-360.
 29. FORS, A.C. The beauty of the beast: the matter of meaning in digitalization [online]. *AI & SOCIETY*, 2010, **25**(1), 27-33. ISSN 1435-5655. Verfügbar unter: doi:10.1007/s00146-009-0236-z
 30. COVID-19: Implications for business [online]. *McKinsey & Company*, 23. Juli 2020 [Zugriff am: 27. Juli 2020]. Verfügbar unter: <https://www.mckinsey.com/business-functions/risk/our-insights/covid-19-implications-for-business>