

The Human Side of Digital Transformation – Understanding the Changing Role of Employees and Leaders

Dissertation to obtain the doctoral degree of Economic Sciences (Dr. oec.)

**Faculty of Business, Economics and Social Sciences
University of Hohenheim**

Institute of Marketing & Management

submitted by
Eva-Helen Krehl

from *Böblingen*
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Date of Disputation: 20.12.2021

Faculty Dean: Prof. Dr. Karsten Hadwich

Supervisor: Prof. Dr. Marion Büttgen

Second Reviewer: Prof. Dr. Karsten Hadwich

Table of Contents

Table of Contents.....	II
List of Figures	III
List of Tables.....	IV
List of Abbreviations.....	V
1. How Technology is Changing Employees' Roles in the Service Encounter – A Skill-Based Analysis	7
1.1 Introduction.....	7
1.2 Use of Technology in Service Encounters.....	9
1.2.1 Definition of Frontline Service Technologies	9
1.2.2 Classification of Frontline Service Technologies	9
1.3 Transformed Employee Roles in Technology-Based Service Encounters	15
1.4 Employee Skills in Technology-Based Service Encounters.....	18
1.4.1 Development of a Skill-Based Framework	18
1.4.2 Archetype- and Role-Specific Frontline Service Employee Skills	21
1.5 Discussion	25
1.6 References	27
2. Uncovering the Complexities of Remote Leadership and the Usage of Digital Tools during the COVID-19 Pandemic – A Qualitative Diary Study ...	34
2.1 Introduction.....	34
2.2 Literature Review and Focus of the Study.....	36
2.3 Method	38
2.4 Findings.....	45
2.5 General Discussion	53
2.6 References	60
3. Appendix.....	66
4. Full List of References	68
Declarations of Co-Authorship	80

List of Figures

Figure 1: Overview of core chapter structure of this paper (author's illustration)	8
Figure 2: Overview of FST archetypes.....	14

List of Tables

Table 1: Frontline service employee skill framework.....	20
Table 2: Human-augmented service encounter archetypes, examples, and corresponding focus service employee roles and skills	24
Table 3: Sample consisting of 31 leaders who participated over a 5-work-day period.....	40
Table 4: Initial template.....	42
Table 5: Final template.	44
Table 6: Definitions of the four remote leadership practices that are common during the COVID-19 pandemic.....	47
Table 7: Findings about RQ 3 – Summary of qualitative analysis of key drivers and barriers related to leadership effectiveness.....	50

List of Abbreviations

AI	Artificial Intelligence
AR	Augmented Reality
ATM	Automated Teller Machine
COSE	Customer Orientation of Service Employees
COVID-19	Coronavirus SARS-CoV-2 disease, first identified in December 2019
FLSE	Frontline Service Employees
FST	Frontline Service Technology
GISI	Generation of Ideas for Service Improvement
IoT	Internet of Things
M2M	Machine-to-Machine
MS Teams	Microsoft Teams
MV	Mean Value
VUCA	Volatile, Uncertain, Complex, and Ambiguous Environment

Chapter 1

How Technology is Changing Employees' Roles in the Service Encounter – A Skill-Based Analysis

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1. How Technology is Changing Employees' Roles in the Service Encounter – A Skill-Based Analysis¹

1.1 Introduction

The use of new technologies, such as robotic process automation, artificial intelligence (AI), or virtual reality, is increasingly reshaping the service industry by changing the service production and delivery process, representing a substantial source of innovation but, at the same time, threatening human jobs (Breidbach & Maglio, 2016; Breidbach et al., 2018; Huang & Rust, 2018). Many parts of service interactions have already been automated through the usage of new technologies, thus turning customer service into self-service (Fluss, 2017; Huang & Rust, 2018). For example, service robots with a physical representation such as Pepper, which is used in retail stores to take and fulfill orders, or virtual representation, such as Alexa, which can be used for voice-based banking (Keating et al., 2018; Wirtz et al., 2018).

It is difficult to predict the impact of these new technologies (Breidbach et al., 2018; De Keyser et al., 2019). However, the employee's role is changing in an evolving service context, where technology is increasingly substituting for service employees in practice (Bowen, 2016). It is important to note that employees still play an essential role in service interactions. Organizations gain the highest performance improvements when humans and machines work together, compared to technology-free or full technology service encounters (Wilson & Daugherty, 2018). Employees remain important actors in service interactions, since humans can empower virtual robots in multiple ways, for example, by teaching them what they need to do, or explaining the outcomes to other human actors to enhance transparency (Wilson & Daugherty, 2018). However, to date, there is little research on what specific skills are needed for service employees to execute their role in the technology-based service encounter (Larivière et al., 2017). Nevertheless, employees should know which human skills are required in combination with new technologies to

¹ This paper is published as: Krehl, Eva-Helen (2020): How Technology is Changing Employees' Roles in the Service Encounter – A Skill-based Analysis. In: Bruhn, M., Hadwich, K. (Eds.): *Automatisierung und Personalisierung von Dienstleistungen*. Forum Dienstleistungsmanagement, Springer Gabler, Wiesbaden, p. 228-249. https://doi.org/10.1007/978-3-658-30166-8_9

achieve high service outcomes (Wilson & Daugherty, 2018). Therefore, an essential question arises: Which specific skills do service employees need in the technology-based service encounter? The answer to this question is also crucial from an organizational point of view to be able to hire and train employees accordingly (Larivière et al., 2017).

Thus, following the call for further research on what specific skills underlie the service employee role in the service encounter (Larivière et al., 2017), the core purpose of this paper is to examine employee roles and concordant skills in technology-based service encounters. As a first step, this paper aims to show how technology is impacting service employees and, hence, begins by classifying the different roles of technology in the service encounter based on the archetypes of De Keyser et al. (2019). Further, the second purpose of this paper is to present the key roles of employees in the technology-based service encounter identified by Bowen (2016) and Larivière et al. (2017). After determining the key roles of technology and service employees, the paper addresses its third and core purpose which is to compile a skill-based framework for service employees and deduce role-specific skills by combining the aforementioned approaches (see Figure 1).

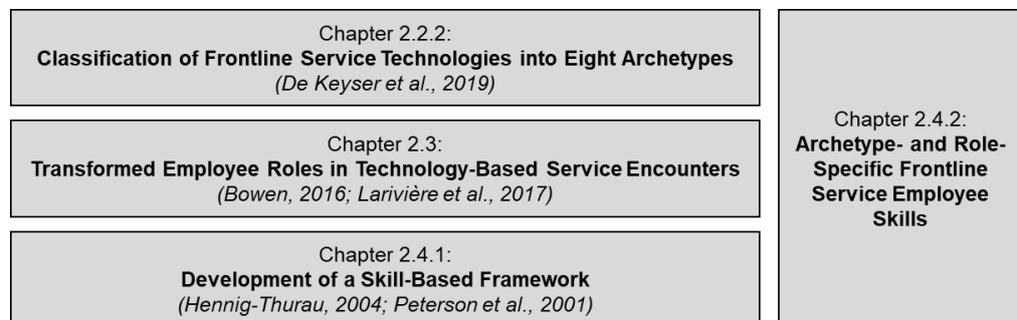


Figure 1: Overview of core chapter structure of this paper (author's illustration).

The contribution of this paper is threefold. First, it provides an overview of a classification of frontline service technologies in eight different archetypes (De Keyser et al., 2019). Second, it contributes by providing insights into the current academic discussion about how technology is changing employees' roles in service interactions (Bowen, 2016; Larivière et al., 2017). Third, this paper makes an important contribution by synthesizing the archetypes and employee roles and, consequently, developing a frontline service employee (FLSE) skill-based framework (Peterson et al., 2001; Hennig-Thurau, 2004).

Finally, this paper discusses potential managerial implications and future research directions and thereby contributes to the current service literature.

1.2 Use of Technology in Service Encounters

1.2.1 Definition of Frontline Service Technologies

In the recent past, the service encounter was described as “personal interactions between customers and employees” (Bitner et al., 1990), a “game between persons” (Bowen, 2016) or a “high-touch, low-tech” encounter (Giebelhausen et al., 2014). Today, however, the service encounter is changing rapidly due to the frontline service technology (FST) infusion, which is now omnipresent (De Keyser et al., 2019). According to Van Doorn et al. (2017), “technology infusion” is defined as “the incorporation by service organizations of technological elements into the customer’s frontline experience” (p. 43). Thereby, organizations aim to reduce costs and manage service employees and, at the same time, offer better and more personalized services (Rust & Huang, 2014). Examples of FSTs range from ATMs to humanoid advanced robots or Internet of Things (IoT) applications (Mende et al., 2019).

1.2.2 Classification of Frontline Service Technologies

This chapter provides a classification scheme of the different FST infusion archetypes based on previous research by De Keyser et al. (2019), enriched by the insights of Froehle and Roth (2004), Larivière et al. (2017), and Marinova et al. (2017). De Keyser et al. (2019) use a conceptual approach to update and extend existing classifications of FST. The set of different FST archetypes helps us to understand how technology is changing the service encounter. De Keyser et al. (2019) claim that, in practice, customer journeys typically consist of a combination of several archetypes. The classification scheme roughly categorizes technology-based services into four criteria: technology-free, technology-augmented, technology-substituted, and full technology service encounters (De Keyser et al., 2019). The technology-augmented service encounters comprise technology-assisted, technology-facilitated, and technology-mediated service encounters (see Figure 2).

A) Technology-free FLSE and customer service encounter

The technology-free service encounter, in which technology does not take part, is not further considered in this analysis, since this paper concentrates on technology-infused service encounters (De Keyser et al., 2019).

B) Technology-assisted FLSE (and customer) encounter

Froehle and Roth (2004) describe this archetype as “technology-assisted customer contact,” which underlines the fact that technology is used as assistance to improve the customer contact. In general, technology supports human thinking and behavior in the service encounter (Keating et al., 2018; Larivière et al., 2017; Marinova et al., 2017). A closer look at the employee role and tasks in this archetype reveals that FLSEs use technology to provide a better service encounter outcome and thereby differentiate their services from similar standardized service offerings (Larivière et al., 2017). Due to the direct interaction between customers and FLSEs, employees gain the chance to develop a deep understanding of their customers and improve the customer relationship by delivering great service (Huang & Rust, 2017; Wirtz et al., 2018).

One common example is airline or hotel check-ins when FLSEs get assistance from a service terminal to check in their customers. In this situation, customers do not have access to the technology (Froehle & Roth, 2004). Another emerging example is augmented reality (AR) catering menus, where service employees are able to present the food directly on the table in front of their customers (Keating et al., 2018). As a third example, smart glasses are smart technologies that augment service employees' capacity (Huang & Rust, 2017). Using smart glasses, FLSEs can receive real-time customer-specific information to support individual cross-selling offerings (Huang & Rust, 2017; Larivière et al., 2017).

To conclude, it may be stated that, in the technology-assisted FLSE (and customer) encounter archetype, service employees can make use of the high human touch to differentiate themselves from competitors, which is needed since differentiation is important in more standardized services (e.g., airline check-in) with a low amount of tech. Moreover, the customer interaction with and direct physical presence of the FLSEs are valuable means to understanding the customers and being able to generate innovative ideas for an even better customer experience (De Keyser et al., 2019).

C) Technology-assisted customer (and FLSE) encounter

In turn, the technology-assisted customer (and FLSE) encounter archetype represents service encounters in which the customer – and not the FLSE – is augmented by technology (De Keyser et al., 2019). Since more and more customers are non-stop online with one or more mobile devices and other wearables, this archetype becomes increasingly relevant (De Keyser et al., 2019). Research about in-store mobile phone use shows the customers' distraction through the parallel use of mobile devices (e.g., comparing prices) and the decreasing impact on point-of-purchase sales (Grewal et al., 2018). Losing sales to the internet can negatively impact FLSEs who may feel threatened in their role as salespersons (Rapp et al., 2015). Applications are emerging on the market, such as Google Lens, which supports customers in obtaining real-time relevant product information by scanning (De Keyser et al., 2019). This could help FLSEs to spend the majority of their time on providing complex information to customers and referring to the app for other less important details.

Employee tasks in this archetype are mainly the customer interaction, whereby a company could make a difference, such as providing an innovative application for their customers to support the sales experience. Human interaction remains important in this archetype, since, to this point, "human capital remains a non-substitutable source of innovation and creativity" (Bowen, 2016).

D) Technology-facilitated FLSE and customer encounter

Froehle and Roth (2004) call this archetype "technology-facilitated customer contact". Here FLSEs, as well as the customers, do have access to the technology. The interaction can be described as technology that creates a connection between an FLSE and a customer (Larivière et al., 2017). FLSEs enable their customers to commonly use the technology in the service encounter. Due to the use of technology, service employees are able to handle complex service situations that could never be managed manually (Bitner et al., 2000).

One example is online counselling or education that is done mostly online (Keating et al., 2018). Another example is IKEA's kitchen co-design approach, which is applied in direct physical presence of the customer and FLSE (De Keyser et al., 2019). An emerging example is the Microsoft HoloLens,

which allows users to see different Lowe's kitchen layouts in real-time while receiving assistance from an FLSE (De Keyser et al., 2019).

E) Technology-mediated FLSE and customer encounter

The technology-mediated encounter archetype (Froehle & Roth, 2004) is characterized by connecting geographically separated actors (De Keyser et al., 2019). Technology enables the interaction between customers and FLSEs who are physically co-located (Froehle & Roth, 2004). Through the use of technology, the perceived distance is reduced and other benefits, such as time efficiency, convenience, or cost reduction, gain in value (De Keyser et al., 2019). Employees' tasks in this archetype focus on technological skills, which make them feel confident when using the technology. Typical examples of this archetype are service encounters via phone, e-mail, or live chat (De Keyser et al., 2019). A more recent use is the case of transatlantic surgery, for example, when US surgeons control a surgical robot working in a European hospital (Schumann et al., 2012).

F) Technology-substituted FLSE encounter

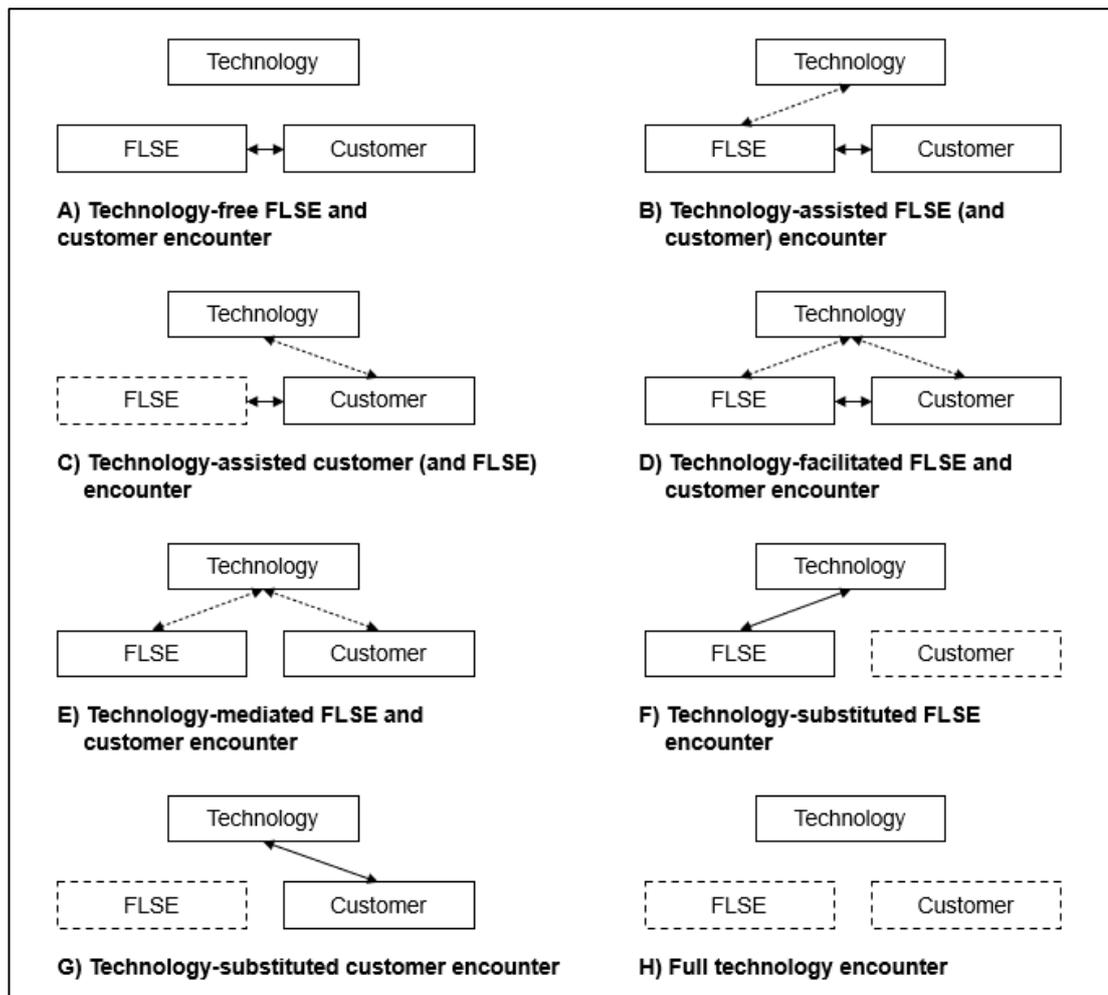
This archetype involves service encounters where technology substitutes for customers, for example, through IoT applications. Technologies either make decisions autonomously on behalf of their customers (e.g., "sense" customers' locations) or use pre-defined customer preferences (e.g., characteristics or behaviors which trigger actions) (De Keyser et al., 2019; Verhoef et al., 2017). In this case, FLSEs communicate with technologies instead of customers (De Keyser et al., 2019), and thereby high technical skills are required. The interaction happens mainly remotely, meaning the service provider is able to access the service object while being co-located (Schumann et al., 2012). Examples can be found in the fields of IT, such as remote control of IT systems, or in engineering, such as remote repair or maintenance (De Keyser et al., 2019). Another example is Google Duplex, the technology makes calls on behalf of their users to schedule appointments (De Keyser et al., 2019). The advantage of this archetype is to provide the highest convenience to their customers by undertaking actions on their behalf and not being restricted to a location (Berry et al., 2002; Schumann et al., 2012; De Keyser et al., 2019).

G) Technology-substituted customer encounter

In the archetype of the technology-substituted customer encounter, employees are completely replaced by technology. There is no interaction between the FLSE and the customer needed (Bitner et al., 2000; Keating et al., 2018). The use of technologies in this archetype is typically represented in the example of self-service technologies, such as ATMs, online banking, online retailing, or automated car washes (Froehle & Roth, 2004; Scherer et al., 2015; De Keyser et al., 2019). The substituted tasks are highly commoditized, very simple to perform, and repetitive (Huang & Rust, 2017). Driverless cars are another upcoming example where highly commoditized transactional services involve no humans (Huang & Rust, 2017). The value of this archetype can be summarized as its higher flexibility (Meuter et al., 2000) and convenience for the customer (Berry et al., 2002; Ding et al., 2007), as well as increased customer satisfaction resulting from a high participation level (Dong et al., 2015).

H) Full technology encounter

Finally, the full technology encounter entails situations where no active involvement of either FLSEs or customers is needed (De Keyser et al., 2019). According to Van Doorn et al. (2017), machine-to-machine (M2M) transactions will gain importance due to current IoT developments. M2M is described as fully automated service encounters with minimal human intervention (Van Doorn et al., 2017). One example of this emerging archetype is toll programs, where transponders inside cars interact with sensors in toll lanes when driving through the toll station. The system works by using a connected prepaid toll account and no action – from an FLSE or customer – during the journey is required (De Keyser et al., 2019). This archetype provides a high service convenience and fast service delivery for customers, as well as cost savings for the service provider (Berry et al., 2002).



Notes: FLSE = frontline service employees; FST = frontline service technology; direct interaction; direct interaction augmented by technology; substituted by technology.

Figure 2: Overview of FST archetypes (De Keyser et al., 2019, p. 159; Froehle & Roth, 2004, p. 3).

Taken together, FST plays two key roles in the service encounter: one is technology as human augmentation (archetypes B – F), and the other is technology as human substitution (archetypes G and H). Archetype F is a borderline case, since FLSEs are augmented and customers are substituted by technology. However, this paper concentrates on the role of FTEs, therefore archetype F is included in the further analysis of human-augmented service encounters. The focus of the next chapter is on the transformed employee roles in the service encounter, where FLSEs are not substituted.

1.3 Transformed Employee Roles in Technology-Based Service Encounters

The role of service employees has changed dramatically over the last decades (Bowen, 2016). In earlier works, the dyadic interactions between service employees and customers were the focus (Solomon et al., 1985). Currently, the context in which service encounters take place has evolved from dyadic interactions to technology-enabled complex service networks (Tax et al., 2013). Further, the analysis of service outcomes has shifted from service quality and service satisfaction to overall customer experience (Bowen, 2016; Maklan & Klaus, 2011; Verhoef et al., 2017).

However, little research has examined which roles service employees fill in a more complex and technology-enabled service context. Some notable exceptions include Bowen (2016) and Larivière et al.'s (2017) studies, presenting four transformed employee roles: the innovator, differentiator, enabler, and coordinator. Bowen (2016) introduces these roles in the light of an evolving service context, whereas Larivière et al. (2017) draw on these elaborations and also indicate that the traditional service employee role, delivering the service, persists in various services today. Nevertheless, it is relevant to understand how employee roles are already changing to prepare for the future of the human workforce (Larivière et al., 2017). It is also important to mention that service employees could perform one or more of the four roles at the same time, meaning that these roles do not exclude each other (Bowen, 2016; Larivière et al., 2017).

The role of innovator

One transformed role of service employees is the role as innovator (Larivière et al., 2017). The innovator role is an important one since "human capital remains a non-substitutional source of innovation and creativity" (Bowen, 2016). This might seem to be no new finding, but especially in combination with technology, service employees can create innovative ideas, which are scalable and customized (Brynjolfsson & McAfee, 2012).

Ordanini and Parasuraman (2011) find that collaborating with contact employees in the service innovation process enhances both innovation volume and innovation radicalness. Innovation volume was operationalized as the

number of service innovations implemented for one year, and innovation radicalness was defined as the extent to which a firm's new service is radically distinguished from current offerings (Ordanini & Parasuraman, 2011). They explain that the strong effect is based on the frequent and close interactions with the customers and, therefore, being able to identify room for improvement (Ordanini & Parasuraman, 2011).

Lages and Piercy (2012) investigate, in their study about service innovation, the drivers of employee generation of ideas for service improvement (GISI). Their research shows that employee reading of customer needs is the major driver of the GISI (Lages & Piercy, 2012). These results lead to the managerial implication of carefully selecting and recruiting service employees, especially paying attention to their ability to read customer needs (Lages & Piercy, 2012).

The role of differentiator

In the role as differentiators, the service employees are making the difference for customers, and not the technology which can – in most cases – be replicated easily (Larivière et al., 2017; Wirtz & Jerger, 2016). Often, small details make a big difference, especially when competitors only differentiate by price (Bolton et al., 2014). But, only by adding the right degree of human touch to the service encounter will service employees be able to differentiate from competitors (Bowen, 2016). Service employees must be behaviorally equipped to handle a wide variety of difficult situations; therefore, the most relevant skills are mainly interpersonal skills and social skills (Wirtz & Jerger, 2016).

The fit between an organization's brand and employees is described as employee brand identification, and it impacts the service quality (Hurrell & Scholarios, 2014). Research by Hurrell and Scholarios (2014) shows evidence that "the people make the brand" in services. Their findings support the proposition "that employee brand identification will be strong in organizations that report few social skill gaps" and vice versa (Hurrell & Scholarios, 2014). The authors define the various needed social skills, such as service orientation or social perception skills (Peterson et al., 2001). Thus, employees' brand identity and social skills could be some of the small details which make the difference for customers in the service encounter.

The role of enabler

Another service employee role in the transformed service context is the enabler role (Bowen, 2016). Due to technology infusion in the service encounter, FLSEs augmented or substituted by technology. However, using new technologies could lead to a negative or frustrating customer experience, for example, when problems occur due to difficulties in the process. By performing the enabler role, employees have the chance to re-verse this negative experience into a positive and satisfying experience (Larivière et al., 2017) by empowering their customers to successfully use new technology. FLSEs enable customers, as well as technology, to perform in the service encounter and thereby support an improved service outcome (Bowen, 2016). The focus lies on how the employee can add to the technology-customer exchange, and not on how technology can add to the employee-customer exchange (Bowen, 2016).

Research by Parasuraman (2000) concerning the “technology readiness” of service employees and customers shows that employees must assist customers with a low technology readiness index to enable them using technology-based systems (Bowen, 2016). Wunderlich et al. (2013) reveal how service employees can contribute to the customers' acceptance of technology-based, smart interactive services, for example, by increasing social presence.

The role of coordinator

The final transformed service employee role proposed by Bowen (2016) and Larivière et al. (2017) is the coordinator role. Traditionally the “service encounter” is a dyadic concept including the service provider and the customer (Tax et al., 2013). But, in times of technology infusion, from a customer's perspective, not only one service provider takes part in the customer's journey. Leading and subordinate service providers act together in a service delivery network (Tax et al., 2013). In this service delivery network, customers act as “resource integrators” to pursue a specific objective (Lusch & Vargo, 2006). In the context of complex service systems and networks, such as those based on technical platforms, the service employee role of the coordinator becomes increasingly relevant (Ostrom et al., 2015). The several interactions among multiple parties require active coordination by service employees (Larivière et al., 2017). Besides handling coordinative tasks, service employees act as a

harmonizing party among the network partners to manage the interdependencies (Tax et al., 2013). A good customer experience gains value through consistency and connectivity of touchpoints, which assure seamless transitions (Homburg et al., 2017). According to Bowen (2016), additional research is required to specify the skills that employees (and customers) need to perform the coordinator role. Indeed, resource management is an important skill to integrate and manage resources from one's own organization and other network partners (Bowen, 2016). For example, in engineering service ecosystems in the automotive industry, interdependencies among several actors, such as the provider of engineering services, the vehicle manufacturer, the test bench specialist and different suppliers, need to be coordinated (Becker, 2019).

To sum up, these four roles clearly emphasize the contribution of service employees in technology-based service encounters and answer the question how technology changes FLSEs' roles (Larivière et al., 2017). FLSEs assume these roles in "varying degrees depending on the context" (Bowen, 2016).

1.4 Employee Skills in Technology-Based Service Encounters

1.4.1 Development of a Skill-Based Framework

After having delineated the roles, technology can have in the service encounter and how employee roles are transformed due to technological impact, this chapter will now focus on the essential component of employee skills. The following section concentrates on the specific skills employees will need in the context of new technologies in the service encounter. Skills can be defined as a person's level of competency to perform a task and can be improved by training or gaining experience in specific tasks (Peterson et al., 2001).

To provide a more detailed overview about the specific skills across all employee roles and human-augmented archetypes, a skill-based framework was developed based on existing construct definitions. The skills taxonomy by Peterson et al. (2001) and the skill dimensions of the customer orientation of service employees (COSE) (Hennig-Thurau, 2004) were used as a basis for the conceptualization of the FLSE skill-based framework. The skills taxonomy by Peterson et al. (2001) concentrates on environmental change, since it was

originally developed to answer the question of what skills should be developed in the workforce due to technological changes. The taxonomy is separated into two dimensions: basic skills (content and process skills) and cross-functional skills (problem-solving, social, technical, systems, and resource management skills) (Peterson et al., 2001). Additionally, the four-dimensional conceptualization of the COSE skills was especially created for service employees, since customer orientation was identified as the major element of a service (Hennig-Thurau, 2004). The four COSE dimensions are social skills, technical skills, motivation, and authority (Hennig-Thurau, 2004). By synthesizing both elaborations, service employee skills with a focus on customer orientation in a changing context are covered.

As a result of merging the skills taxonomy (Peterson et al., 2001) and the COSE dimensions (Hennig-Thurau, 2004), a skill-based framework was developed, concentrating on FLSE skills in the technology-infused service encounter. The FLSE skill framework consists of six dimensions: social skills, technical skills, problem-solving skills, resource management skills, decision-making authority, and motivation. Each of the six dimensions can be broken down to several subdimensions (see Table 1).

Skill-Based Framework for Frontline Service Employees
<i>BASIC SKILLS</i>
<p><i>Social skills</i> (Hennig-Thurau, 2004; Peterson et al., 2001):</p> <ul style="list-style-type: none"> – having extensive social skills/high social perceptiveness – being able to consider customers' perspectives – knowing how to treat a customer well/high service orientation
<p><i>Technical skills</i> (Hennig-Thurau, 2004):</p> <ul style="list-style-type: none"> – having a high level of knowledge – being experts in their job – being highly competent
<i>CROSS-FUNCTIONAL SKILLS</i>
<p><i>Problem-solving skills</i> (Peterson et al., 2001):</p> <ul style="list-style-type: none"> – being able to identify problems – being able to generate innovative ideas – showing a high solution orientation
<p><i>Resource management skills</i> (Peterson et al., 2001):</p> <ul style="list-style-type: none"> – having a high level of time management skills – knowing how to manage material resources – knowing how to manage personnel resources
<i>ESSENTIALS TO TRANSFER FLSE SKILLS INTO BEHAVIORS</i>
<p><i>Decision-making authority</i> (Hennig-Thurau, 2004):</p> <ul style="list-style-type: none"> – being able to decide autonomously in customer matters – having appropriate room to maneuver in solving customer problems – not needing to ask a supervisor for permission

- Motivation* (Hennig-Thurau, 2004):
- showing strong commitment to do the job
 - doing the best to fulfill their customer needs
 - being always highly motivated

Table 1: Frontline service employee skill framework (adapted from Hennig-Thurau, 2004, p. 477 and Peterson et al., 2001, p. 465).

The six dimensions are divided into three types: basic skills, cross-functional skills and essentials to transfer FLSE skills into behaviors (Hennig-Thurau, 2004). In this paper, I propose social and technical skills as basic skills in the technology-based service encounter. Social skills mainly cover interpersonal skills and the ability to interact and understand customers. Technical skills involve a high tech-affinity and expert knowledge about new technologies.

Additionally, I propose cross-functional skills, which summarize problem-solving and resource management skills. Problem-solving skills involve problem identification and solutions, as well as innovation and creativity. Resource management skills comprise management of time, people, and material resources. Both skill types are considered as cross-functional, since problem-solving, as well as resource management, involves comprehensive thinking and interaction.

Finally, I propose to cover essentials to transfer FLSE skills into behaviors, such as decision-making authority and motivational skills. Autonomously making decisions and thereby being able to immediately take action, such as solving customer problems, describes the first dimension. Being intrinsically highly motivated and being able to motivate others are the skills in the final dimension of the skill framework. Being motivated can be defined as being “moved to do something,” for example, when FLSEs are responsible to introduce new technologies or other service innovations to their customers and thereby need to be intrinsically motivated as well as being able to motivate their customers (Cadwallader et al., 2010).

In summary, it can be said that all six dimensions are relevant for FLSEs to perform their roles in the technology-based service encounter. While some skills might be more role-specific than others, a comprehensive analysis will be conducted in the next chapter.

1.4.2 Archetype- and Role-Specific Frontline Service Employee Skills

This chapter provides a synthesis of the following: 1) human-augmented service encounter archetypes, 2) FLSE transformed roles, and 3) FLSE skills. Through allocation of archetypes, roles, and skills, an overview was developed, creating a number of propositions and supporting the literature, along with practical applications.

Services can be provided by humans and/or machines (Huang & Rust, 2018). The skill-based framework focusses solely on augmented services (archetypes B–F), where employees still play an active role in the service encounter. Employee roles and tasks differ depending on the FST archetypes. In order to detect the role-specific FLSE skills in technology-based service encounters, each of the four identified transformed employee roles is further examined. Thus, it is important to understand that the employee roles are not mutually exclusive, meaning an employee might perform more than one role if required by the context (Larivière et al., 2017). Further investigation into the five human-augmented technology archetypes outlines which transformed employee roles and corresponding skills might be more likely performed in which technological archetype. These roles will be called “focus roles” in the following. Also, focus roles are not mutually exclusive, meaning several roles can be performed in one archetype.

According to the basic skills, it can be recognized that social skills are more important in archetypes B–D, where a direct interaction between the FLSE and the customer exists. Technical skills are highly relevant in archetypes where a direct interaction (or one augmented by technology) between FLSE and technology exists, as in archetypes B, D, E, and F.

- *Archetype B: technology-assisted FLSE (and customer) encounter (e.g., airline check-in)*

The example of technology-assisted airline check-in shows that the technology – assisting the FLSE – is not the main factor which brings differentiation in this archetype (Bowen, 2016). However, the FLSE her/himself more likely performs the differentiator role by developing a customer experience with authentic human touches (Bolton et al., 2014). Customers in the technology-infused service encounter often seem to be very internet-savvy; however, many cases (e.g., failure handling) show that many of

them prefer the human touch in the (after-)sales interaction (De Keyser et al., 2015; Larivière et al., 2017). Besides a focus on social skills, flexibility is also a relevant differentiator skill, which is required to meet individual customer needs (Bolton et al., 2014).

- *Archetype C: technology-assisted customer (and FLSE) encounter (e.g., in-store mobile phone use)*

When customers are always online, using their mobile devices in-store to get assistance while comparing prices and offerings, it seems that the importance of FLSEs decreases (Rapp et al., 2015; De Keyser et al., 2019). But FLSEs can use the direct customer contact and transfer the information they receive firsthand about their customers into innovative ideas, such as while they observe customer behaviors and reactions (Larivière et al., 2017). In this archetype, FLSEs might increasingly perform the innovator role by generating innovative technology-based ideas during the customer interaction to create new solutions improving the service outcome (Brynjolfsson & McAfee, 2012). Service innovation primarily evolves in the service encounter interaction between FLSEs and customers, for example, by developing ad hoc solutions for customers in the case of unplanned problems (Siahtiri, 2018). Another example is the development of new applications where customers can scan the products and get real-time information, thereby allowing the FLSEs to strengthen their roles in focusing on the more complex questions (De Keyser et al., 2019). Specific FLSE skills could be described as distinct problem-solving skills combined with the ability to read customer needs (Bowen, 2016).

- *Archetype D: technology-facilitated FLSE and customer encounter (e.g., IKEA's kitchen co-design approach)*

The example of the IKEA kitchens' co-design approach shows that employees might perform the role of the enabler in this archetype (De Keyser et al., 2019). In the service encounter, both parties – FLSEs and customers – use the technology together, thereby the employee supports and enables the customers by using the technology (Bowen, 2016). Enabler skills are mainly technical skills, since FLSEs need to feel confident in using the new technology to be able to enable their customers (Bowen, 2016). These distinct technical skills are complemented by inter-personal skills,

which we put on a level with social skills (Bowen, 2016). As an example, FLSEs in the “back office” enable technology and thereby function as “front-line” employees in technology-infused service encounters (Bowen, 2016).

- *Archetype E: technology-mediated FLSE and customer encounter (e.g., transatlantic surgery with surgical robots)*

As represented in the transatlantic surgery example, FLSEs play a coordinating role in this archetype (De Keyser et al., 2019). In the role as coordinator, FLSEs manage several involved interdependencies, such as customers (patient) and technology (surgical robot), as well as themselves (Bowen, 2016). To gain efficiency, mainly resource management skills are required to harmonize interdependencies among network partners (Tax et al., 2013).

- *Archetype F: technology-substituted FLSE encounter (e.g., remote control of IT systems)*

Similar to archetype D, where the FLSE acts as an enabler for the customers, the FLSE acts as an enabler for the technology. As the example of remote control of IT systems shows, there is no longer any interaction between the FLSE and customer (De Keyser et al., 2019). This means that the FLSE mainly interacts with the technology, and high technical skills are therefore required (De Keyser et al., 2019).

The following table (Table 2) provides an overview of the five human-augmented archetypes, including the discussed examples. According to Keating et al. (2018), the archetypes are classified depending on their respective touch and tech degrees. The focus FLSE roles and principal FLSE skills are listed in the columns on the right-hand side. These roles and skills are highlighted as focus roles and principal skills since the assumption is that these are mainly performed and required, but still complemented by additional roles and skills depending on the context.

Archetype + Example	Touch/tech degree	Focus FLSE role	Principal skill(s)
<i>B) Airline check-in</i>	High touch/low tech	Differentiator	Social skills
<i>C) In-store apps</i>	High touch/low tech	Innovator	Problem-solving skills
<i>D) IKEA kitchen co-design</i>	High touch/high tech	Enabler (FLSE enables customer)	Social skills + technical skills
<i>E) Surgical robot</i>	Low touch/high tech	Coordinator	Resource management skills
<i>F) Remote control of IT systems</i>	Low touch/high tech	Enabler (FLSE enables technology)	Technical skills

Table 2: Human-augmented service encounter archetypes, examples, and corresponding focus service employee roles and skills (author's illustration, adapted from Bowen, 2016; De Keyser et al., 2019; Keating et al., 2018; Larivière et al., 2017).

There are skill types which are assumed to be of higher importance for specific FLSE roles, such as social skills for the differentiator, problem-solving skills for the innovator, social and technical skills for the enabler, or resource management skills for the coordinator. In general, it can be stated that FLSEs need to have a deep understanding of their customers and (technical) service processes to deliver an appropriate service outcome (Wirtz et al., 2018). Therefore, each of the six identified skill types will be required depending on the situation. However, research in this area shows that the top priority of FLSE skills will be the "softer" intuitive and empathic social skills, since AI is taking over more and more of the analytical tasks (Huang & Rust, 2018). Research on the future of technology-based service encounters with a timeline up to 2050 predicts a change from service encounters dominated by robots and virtual assistants to technology-assisted service encounters, where technology is supporting the interpersonal and or virtual interaction between FLSEs and customers (Keating et al., 2018). This scenario again highlights the need for the social skills of service employees, whereas analytical skills could be covered by technology (Huang & Rust, 2018). To achieve the desired service outcomes, training for FLSEs is needed. For example, FLSEs need to learn routines in the service processes, memorize important information, and feel confident using technology in the service encounter (Wirtz et al., 2018).

1.5 Discussion

Technologies are rapidly changing the service encounter of organizations and, at the same time, service employee' roles. The primary purpose of this paper was to answer how these new technologies are changing frontline service employee roles. This paper has contributed to our understanding of how technology is changing employees' roles in the service encounter by first presenting a classification scheme of eight different service encounter archetypes, thus showing how the focus lies more precisely on human-augmented service encounters. Additionally, the paper highlights four transformed frontline service employee roles, as well as the corresponding skill types. In particular, a skill-based framework for frontline service employees was developed.

Considering the different service encounter archetypes, it is important to understand that the technical infusion of the service encounter does not always mean substitution of service employees. Instead, new technologies augment service employee roles and require new skills depending on the context. Emerging archetypes can range from human-augmented, via human-substituted to full technology service encounters. Employee roles differ depending on the technological impact in the service encounter. Transformed roles as innovator, differentiator, coordinator, or enabler require specific employee skills. The main skill types are social, technical, problem-solving, and resource management skills, as well as high motivation and autonomous decision authority.

The insights presented in this paper also provide some contributions for practitioners. For example, organizations that consider the implementation of a new technology and the usage of the classification scheme to weigh the pros and cons of the different technological archetypes in terms of augmentation or substitution of employees can thus be better informed. Thus, they could include existing employee skills in their considerations based on the developed skill-based framework. Also, an organization's management team could think about the presented transformed employee tasks and skills and plan how to hire and train service employees for the required roles. In practice, it seems that organizations have yet to solve how to hire and train service employees for these roles (Bowen, 2016). Finally, it could be important for managers to carefully determine the need for training and support on an individual level,

since implementing a specific archetype or transitioning from one archetype to another has different impacts on various employees (De Keyser et al., 2019).

In terms of training or employee development, an interesting approach, which could be considered, is the “T-Shaped” approach (Bowen, 2016). FLSEs with T-shaped skills profit from specific skills in which they are experts in “specific” skills (vertical axis), such as coding skills, and, at the same time, several “broad” skills across different contexts and functions (horizontal axis), such as problem-solving skills (Barile et al., 2015). The cross-functional skills are required to innovate in a fast-changing environment (Barile et al., 2015). Moreover, T-shaped employees bring the flexibility to switch between the principal vertical skills and overarching horizontal skills as required from their environment (Demirkan & Sphorer, 2015). In the light of digital transformation, the T-shaped approach helps FLSEs to stay flexible and adapt situationally.

Notwithstanding the above contributions, the paper has some limitations, which lead to future research ideas. First, it is especially important to empirically explore the transformed service employee roles. Therefore, it can be suggested, as one way to extend the work, to conduct an exploratory study, for example, by collecting qualitative interview data as a first step (Breibach & Maglio, 2016). Moreover, other researchers are encouraged to conduct further research on the impact of new technologies in the service encounter, especially to gain further insights into employee roles in the technology-based service encounter. Therefore, various questions need to be explored in further research, for example: How can companies support their FLSEs to gain a high service outcome in a changing environment (besides training)? and How can a high fit between FLSEs skills and service employee role be assured?

In sum, this paper has illuminated in particular, the employee-specific opportunities of technology-infused service encounters and thereby aims to contribute to further research in this area.

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Chapter 2

Uncovering the complexities of remote leadership and the usage of digital tools during the COVID-19 pandemic – A qualitative diary study

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This manuscript represents a co-authorship. Contributing authors are as follows: Krehl, Eva-Helen; Büttgen, Marion. The citation style was adapted to the present work in order to ensure a uniform way of citation.

2. Uncovering the Complexities of Remote Leadership and the Usage of Digital Tools during the COVID-19 Pandemic – A Qualitative Diary Study²

2.1 Introduction

The global health and economic crises related to the COVID-19 pandemic have led to extensive social distancing rules to reduce the spread of the coronavirus (Bick et al., 2020). To avoid physical contact and control the risk of spreading the virus at work, many organizations have required their employees to work from home (Brynjolfsson et al., 2020). In Germany, approximately 27% of employees worked from home during the first lockdown in April 2020, compared with 4% before the COVID-19 pandemic (Kohlrausch et al., 2021). The abrupt lockdown situation has forced rapid changes in daily routines and has made people quickly adapt to new circumstances and the intensive use of digital tools (Criscuolo et al., 2020). In the longer term, working from home could be the new normal (Sanchez, 2018), at least to some degree, for many office jobs (Criscuolo et al., 2020). Due to the COVID-19 pandemic, teams who were used to working together in an office environment have suddenly been separated. This extraordinary situation has made leadership quite challenging and complex. While research about e-leadership (Avolio et al., 2000; Cascio & Shurygailo, 2002) and virtual leadership (Hoch and Kozlowski, 2014; Liao, 2017; Ziek & Smulowitz, 2014; Zigurs, 2003) is already established, there is limited research about unforeseeable remote leadership during a pandemic crisis – especially, the effective usage of digital tools while leading from home is underexplored.

The COVID-19 pandemic is considered an accelerator of digital transformation in organizations (Bartsch et al., 2020). Scholars have recently

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started to investigate virtual leadership in the context of the global pandemic (e.g., Al Saidi et al., 2020; Bartsch et al., 2020; Bauwens et al., 2021). These studies analyze changed leadership in a changed world (Uhl-Bien, 2021) and show that in remote work environments, demonstrating task-oriented leadership behaviors, and even more so, relation-oriented ones, are relevant in handling the complex virtual challenges (Bartsch et al., 2020). However, these studies lack explanatory power. Some solely cover employees' perspective instead of leaders' perspective (e.g., Bartsch et al., 2020). Others only focus on sectors and industries directly impacted by the pandemic, such as health, education, and the government (e.g., Al Saidi et al., 2020; Bauwens et al., 2021; Sergent & Stajkovic, 2020).

As leadership is a daily and constantly changing phenomenon, we follow the call for further studies to explore daily leadership behaviors (Kelemen et al., 2020) and their effectiveness (Knippenberg et al., 2005). Specifically, we explore practices of exemplary remote leadership during the COVID-19 pandemic. Leadership practices refer to leaders' actions when doing their personal best (e.g., "highlights") to accomplish extraordinary feats in their organization (Dirani et al., 2020; Malhotra et al., 2007; Posner & Kouzes, 1988). Hence, we explore the daily experiences of leaders aiming to work effectively while using digital tools and performing their leadership practices remotely during the COVID-19 pandemic. The purpose of our study is to gain a better understanding of remote leadership during a pandemic crisis by addressing the following questions:

- (1) Which day-to-day leadership practices do leaders perform from home during the COVID-19 pandemic?
- (2) Which digital tools do leaders use to support their different leadership practices?
- (3) What factors influence the effectiveness of leadership from home with the aid of digital tools?

To answer these research questions, we employed an exploratory approach with the use of a qualitative study. Daily diary data were collected from 31 leaders who participated in a longitudinal study over a 5-work-day period, resulting in a total of 155 diaries. With this exploratory diary study, we contribute to the literature in at least three ways.

First, we add to the scarce literature on virtual leadership during crises by identifying day-to-day leadership practices from a leader's perspective and classifying them into four categories: 1) solve problems collaboratively and monitor team progress, 2) create space for socializing and teambuilding, 3) make the team feel supported and encourage feedback, and 4) communicate to build a virtual culture of trust. Considering leaders' self-assessment of their leadership practices, our results indicate that leaders tend to focus on operational and team-oriented behaviors.

Second, we enrich the remote leadership literature by providing a detailed understanding about the usage and suitability of digital tools. Remote day-to-day leadership is complex, and leaders should be able to choose the right tools. The complexity of virtual leadership is shown not only by the variety of digital tools used by virtual leaders but also by their frequent reports about using unsuitable tools. Hence, leaders often need to switch tools between tasks or start using a combination of tools. Nevertheless, they tend to use video conferencing as the main digital tool since it works best in replacing face-to-face interactions and thus seems to be a suitable tool for many leadership practices.

Third, we contribute to the research on effective leadership in a challenging and unpredictable situation by identifying several factors that have positive or negative impacts on leadership effectiveness as leaders try to cope with crisis-specific challenges. For example, on one hand, our study identifies the introduction of meeting guidelines and a large number of personal interactions as drivers of effective leadership. On the other hand, the limited support of digital tools for creative and collaborative tasks and missing opportunities for socializing are recognized as barriers to effective virtual leadership.

2.2 Literature Review and Focus of the Study

Crisis leadership

Identifying a situation as a "crisis" varies according to individual viewpoints; however, according to Grint (2005), a crisis can be defined as a critical problem with little time for decision making and action. This scenario is where leaders find themselves during the COVID-19 pandemic, in which the decision

to work from home had to be made abruptly. Crisis leadership has been targeted by scholars even before the COVID-19 pandemic, showing the importance of leaders' ability to render the environment suitable for their intended strategies (e.g., Grint, 2005). In sum, these researchers have arrived at a consensus about the increasingly complex and dynamic environment where leaders must navigate. However, the uncertainties triggered by the current global pandemic have added to the complexity of leadership, which has suddenly taken place in a virtual setup (Bartsch et al., 2020) that has not been taken into account in previous studies.

Virtual leadership

The two main characteristics that distinguish between virtual and conventional teams are the spatial distance and the technologically mediated communication (Bell and Kozlowski, 2002). Based on existing research and in the context of our paper, we define virtual or remote leadership as leading in a (geographically) dispersed work environment, where employee interaction is based on digital tools (Bartsch et al., 2020; Huang et al., 2010). Scholars have investigated different facets of virtual (team) leadership, independent of the COVID-19 pandemic, as follows: e-leadership (e.g., Avolio et al., 2014; Cascio & Shurygailo, 2002), transformational leadership and virtual teams (e.g., Hambley et al., 2007; Hoch & Kozlowski, 2014), virtual teams (e.g., Gupta & Pathak, 2018; White, 2014), virtual leadership challenges (e.g., Bell & Kozlowski, 2002; Mehtab et al., 2017) and leadership effectiveness (e.g., Kayworth & Leidner, 2002; Malhotra et al., 2007). This large body of research emphasizes the specifics of leading at a distance. For example, Bell & Kozlowski (2002) identify two key leadership functions in virtual teams: performance management and team development. However, the existing literature has scarcely examined the complexities of virtual leadership induced by a crisis.

Leadership and technology

So far, a few studies have begun to investigate the impact of technology on leadership (e.g., Cortellazzo et al., 2019; Larson & DeChurch, 2020). Empirical studies show that digital tools could significantly contribute to problem solving and monitoring processes (e.g., Cortellazzo et al., 2019). Although recent research paper structure existing work and offer some suggestions about leading teams in the digital era (Cortellazzo et al., 2019; Larson & DeChurch,

2020), these studies have limited practical explanatory power about the usage of digital tools in supporting virtual leadership practices.

In sum, scholars have largely investigated different aspects of leadership in recent years, including e-leadership and virtual leadership. However, the effective usage of digital tools while leading from home remains underexplored. Regarding the rapid advances of technology, Larson & DeChurch (2020) call for a new genre of leadership scholarship. Moreover, little empirical work has explored leaders' perspective. Our work addresses this research gap by investigating the intersection of crisis leadership, virtual (team) leadership induced by the COVID-19 pandemic and the usage of digital tools from leaders' perspective.

2.3 Method

The research questions call for an approach that allows examining daily leadership behaviors in their natural context and captures the actual experiences of leaders who use digital tools remotely (Kelemen et al., 2020). Hence, we have conducted an exploratory study to build a comprehensive understanding of day-to-day leadership practices and therefore study leadership in its natural setting. Our work is characterized by an explorative, inductive research approach in form of a qualitative diary study. Compared with many studies including students or employee perspectives, our study involves leaders' self-reports about highlights and lowlights when leading from home during the COVID-19 pandemic.

Studying leadership on a daily basis brings several important theoretical and methodological advantages. First, qualitative daily diaries capture the leaders' immediate and spontaneous assessment of their daily experiences, using digital tools to support leadership practices (Bolger et al., 2003; Patterson, 2005; Poppleton et al., 2008). Daily diaries allow researchers to be as close as possible to the actual experience and capture the context, as well as leadership practices and feelings (Kelemen et al., 2020). Second, examining daily leadership practices allows researchers to explore the complexity of short-term leadership processes, which vary from one day or leadership situation to another (Kelemen et al., 2020). Daily diaries allow researchers to ac-

cess a detailed in-depth examination of the rationale behind and consequences of leadership (Kelemen et al., 2020). Third, an in-depth qualitative analysis enables the exploration of new and important findings (Radcliffe, 2013), including the discovery of challenges during the recent COVID-19 pandemic.

The diaries

In the first step, the diary study was piloted with three leaders and then consecutively rolled out over a seven-week period. Using UNIPARK Quest-back software to technically conduct the diary study turned out to be useful in providing the participants with a web and mobile frontend. The diary was structured into the following parts:

- The introduction included information about the study design and general information about the study (e.g., study set-up, General Data Protection Regulation).
- The main part contained two further sections about the highlights and the lowlights of the work day, analogous to the critical incident technique (Flanagan, 1954). The sections were designed as free text fields. The two sections were each structured into six sub-sections to offer some guidance and make the answers more comparable. After ensuring that the participants provided their reflecting on their job-related activities during the work day, considering their tasks and practices as leaders, we asked them to describe (1) the digital tools they used, (2) for which leadership practices they used the tools, (3) their motivation for using the listed digital tools, (4) their feelings during the usage, (5) how effective the usage was and (6) how they would handle the situation when not working remotely. Questions (3) and (4) were asked in particular to reinforce the mental process of putting the leaders back into the specific situation and thereby allow capturing their practices and motivation about the usage and suitability of digital tools close to their “life as it is lived” (Bolger et al., 2003, p. 580). Finally, they were offered the possibility to leave additional remarks (see the Appendix 10 and 11). The ordering of the highlights and the lowlights was varied from day to day to reduce possible order effects (Poppleton et al., 2008). The main part was repeated for another four work days.

- The final part included person-related and company-related demographics, as well as information about the following study days.

Sample

The sample consisted of 31 leaders who managed to participate over a 5-work-day period, which led to a total of 155 diaries. While recruiting participants for the study, we kept in mind that the chosen method was time consuming and required a high level of dedication from them (Radcliffe, 2013). Despite these constraints, we sought to obtain a highly diverse sample in order to explore a broad range of leadership experiences. The sample was especially diverse in terms of gender, age, and work experience (see Table 3). The digital diary format likely attracted the interest of more digital-savvy leaders, which might have resulted in their self-assessment of 5 out of 7 in digital progressiveness. The data were gathered in Germany between April and May 2020. All participants were volunteers, mainly recruited via private networks and LinkedIn.

Gender	female = 14; male = 17
Age	MV = 40 years (28–61)
Work experience	MV = 15 years (2–35)
Employees	MV = 13 employees (1–100)
Assessment of own progressiveness regarding the use of digital tools	MV = 5 (scale: 1 = low; 7 = high)
Home office before COVID-19	MV = 10% (0–50%)
Industries or professions	financial services (48%), law (10%), media (10%), commercial sector (7%), real estate (7%), automotive (3%), consulting (3%), education (3%), engineering (3%), health (3%), other (3%)

Note. MV = mean value

Table 3: Sample consisting of 31 leaders who participated over a 5-work-day period.

Procedure

The diaries were completed over a five-work-day period, either in the morning or in the evening. The participants received personalized daily follow-up e-mails to remind them to fill in the diary. Some leaders who worked part time or had days off did not participate for five consecutive days but continued until they completed five work days.

Data analysis

Template analysis was used to answer the research questions (King, 1998, 2004). This method is typically applied in research analyzing qualitative diary studies (Poppleton et al., 2008; Radcliffe, 2013; Radcliffe & Cassell, 2015). When working with templates in the thematic analysis of text, researchers generate a list of codes (template), representing the identified themes in their data (King, 2004). The main characteristic of template analysis is that some codes are produced *a priori* and then modified during the iterative coding procedure (King, 2004). The data analysis was conducted using the qualitative research software MAXQDA 2020.

To guide the analysis, template analysis typically starts with a set of predefined codes (King, 2004). As a starting point, the initial template for our study was created based on the insights from the literature review and the questions for the diaries. The initial template consists of three highest-order codes – (1) leadership practices, (2) digital tools used, and (3) factors influencing the use of digital tools – subdivided into one or two levels of lower-order codes (Table 4). The distinction between task- and relation-oriented leadership practices is based on previous findings emphasizing the relevance of both for leadership in virtual work environment (Bartsch et al., 2020; Liao, 2017).

I. Leadership practices
1. Task-oriented
a. Problem solving
b. Monitoring KPIs
2. Relation-oriented
a. Teambuilding
b. Communicating
c. Supporting
d. Socializing
e. Mentoring
f. Networking

II. Digital tools used
1. Video call
2. Call
3. E-mail
4. Chat
5. Collaboration tools

III. Factors influencing the use of digital tools
1. Effective
a. Preparation
b. Personal interaction (virtually)
c. Over-communication
2. Ineffective
a. Cameras off
b. Missing opportunities for socializing and feedback
c. One-way communication

Table 4: Initial template.

In the following step, the diaries were reviewed systematically to identify the sections of text relevant to the identified codes and research questions. First, the text sections were marked with one or more of the corresponding codes of the initial template. Second, changes were made to the template by adding or deleting codes and merging codes into groups. During this process, hierarchical coding was applied, meaning that groups of similar codes were clustered to produce more general higher-order codes (King, 2004). In general, higher-order codes represent broad themes, and lower-order codes signify more narrowly focused themes (King, 2004; Radcliffe & Cassell, 2015).

After all diary data had undergone a second analysis, the diaries were reviewed two more times to fine-tune the template by further adding or deleting codes and merging codes into groups (King, 2004). Finally, several themes were grouped together in a more insightful and informative way to gain relevant insights on the research questions (Radcliffe, 2013). After all diaries had been

read through at least four times, the researchers decided to stop the iterative process and commit on a final template (see Table 5), which served as the basis for interpreting the data, which had all been coded this way (King, 2004).

I. Leadership practices

1. Task-oriented

- a. Solve problems collaboratively and monitor team progress
 - i. Conducting meetings and workshops
 - ii. Holding collaborative work sessions
 - iii. Prioritizing tasks
 - iv. Assigning responsibilities
 - v. Monitoring key performance indicators (KPIs)

2. Relation-oriented

- a. Create space for socializing and teambuilding
 - i. Teambuilding
 - ii. Mood tracking
- b. Make the team feel supported and encourage feedback
 - i. Giving and receiving feedback
 - ii. Mentoring
 - iii. Recognizing good work
 - iii. Empowering employees to make decisions
 - iv. Motivating the team
- c. Communicate to build a virtual culture of trust
 - i. Informing
 - ii. Over-communicating

II. Digital tools used

1. Solve problems collaboratively and monitor team progress

- a. Variety
 - i. Video conference
 - ii. Screensharing
 - iii. E-mail
 - iv. Collaboration tools (e.g., JIRA, Confluence)
- b. Suitability
 - i. Routine/ daily business
 - ii. Missing human factor

2. Create space for socializing and teambuilding

- a. Variety
 - i. Video conference
 - ii. Screensharing
 - iii. Conference calls
 - iv. E-mail
 - v. Messenger
 - vi. SharePoint
-

-
- b. Suitability
 - i. Seeing one another via video
 - ii. (Virtual) interaction via video
 - iii. Face-to-face meetings preferred

3. Make the team feel supported and encourage feedback

- a. Variety
 - i. Video conference
 - ii. Conference calls
 - iii. Screensharing
 - iv. Messenger
- b. Suitability
 - i. Face-to-face meetings preferred

4. Communicate to build a virtual culture of trust

- a. Variety
 - i. Video conference
 - ii. Messenger
 - b. Suitability
 - i. Two-way communication
 - ii. Face-to-face meetings preferred
-

III. Factors influencing the use of digital tools

1. Solve problems collaboratively and monitor team progress

- a. Drivers
 - i. Meeting preparation
 - ii. Meeting guidelines/conference rules
 - iii. Sharing digital notes
 - iv. Moderator role
- b. Barriers
 - i. Cameras off
 - ii. Limited support for creative and collaborative tasks

2. Create space for socializing and teambuilding

- a. Drivers
 - i. Personal interaction
 - ii. Seeing one another (virtually)
- b. Barrier
 - i. Missing opportunities for socializing

3. Make the team feel supported and encourage feedback

- a. Driver
 - i. Ad hoc support
- b. Barriers
 - i. Less opportunities for ad hoc feedback
 - ii. Technical difficulties

4. Communicate to build a virtual culture of trust

- a. Driver
 - i. Over-communication
 - b. Barriers
 - i. Asynchronous communication
 - ii. One-way communication
-

Table 5: Final template.

2.4 Findings

In this section, we answer the research questions by interpreting the coded data and recognizing the patterns. The objective is to identify the main themes that are most relevant to our research questions, as well as select some illustrative quotes (King, 2004). Hence, in the following paragraphs, we present the major themes related to the research questions.

RQ 1: Which day-to-day leadership practices do leaders perform when leading from home during the COVID-19 pandemic?

First, we bundle a set of codes related to task-oriented leadership practices (Bartsch et al., 2020). For example, our study results reveal leadership practices related to “conducting meetings and workshops”, “holding collaborative work sessions”, “prioritizing tasks”, “assigning responsibilities” and “monitoring key performance indicators (KPIs)”. These codes are grouped under the first meta-category of leadership practices, which we name “solve problems collaboratively and monitor team progress”. Leadership practices on both strategic and more operational levels are included under this meta-category. To specify, leaders do not only act on the strategic level by monitoring results and team performance, but even more, they spend a lot of time on the operational level, for example, by guiding virtual meetings to ensure that virtual collaboration works and clarifying who does what until when, or even performing operational tasks on behalf of their team members to resolve virtual collaboration issues and improve employees’ task outcomes. The following are examples under this meta-category:

“Supporting one of my employees regarding time management and then we developed an activity plan together” (Leader_31, Item 2, Day 4).

“I [...] could have given her more background knowledge on the topic in a personal conversation in the office, where we would have discussed the points together, and in the best case, she would have made the corrections, then integrated them into the documents herself” (Leader_15, Item 13, Day 1).

Second, we structure the codes related to relation-oriented leadership practices (Bartsch et al., 2020) and identify three categories. The diary data reveal leadership practices such as “teambuilding activities”, and “mood tracking of the team”, which we summarize under the meta-category “create space for socializing and teambuilding”. When leaders describe these leadership practices, they tend to enact leadership on the team level. Here are two examples reported in the diaries:

"Capturing the current mood of the team, working from home now for six weeks" (Leader_12, Item 2, Day 4).

"Today it was all about teambuilding" (Leader_27, Item 2, Day 5).

Third, the diary data show further relation-oriented leadership practices, namely "giving and receiving feedback", "mentoring", "recognizing good work", "empowering employees to make decisions", and "motivating the team". We label them "make the team feel supported and encourage feedback" leadership practices, illustrated by these examples:

"I gave feedback to my employee and recognized his good performance" (Leader_24, Item 2, Day 3).

"Today I had a meeting with my mentee" (Leader_27, Item 2, Day 2).

"I had to coach my team leader how to handle a difficult issue with one employee" (Leader_10, Item 2, Day 4).

Fourth, "informing" and "over-communicating" comprise the "communicate to build a virtual culture of trust" leadership practices. Examples are as follows:

"Informing employees about the opportunities for short-term work programs and discussing these with them" (Leader_20, Item 2, Day 3).

"Communication of important changes within the team" (Leader_05, Item 10, Day 1).

To sum up, the remote leadership practices exhibited by the participants point out an operational and team-oriented focus (e.g., moderating meetings and workshops or teambuilding).

"The effort for me as a moderator of the meeting was higher, since there was less discussion due to the remote set-up" (Leader_23, Item 5, Day 5).

"We ended the week today together as a team" (Leader_17, Item 2, Day 4).

Table 6 shows the definitions of the specified meta-categories of leadership practices when leading from home during a global pandemic.

Remote leadership practice	Operating definition¹
<i>Solve problems collaboratively and monitor team progress</i>	Organize and coordinate virtual teamwork, solve problems collaboratively and deal with work disruptions by conducting meetings and workshops to clarify questions, holding collaborative work sessions, prioritizing tasks, assigning responsibilities and tasks, and monitoring key performance indicators.
<i>Create space for socializing and teambuilding</i>	Plan time for virtual socializing and teambuilding, show empathy, and regularly checking on employees' mood.

<i>Make the team feel supported and encourage feedback</i>	Make the team feel supported and empower employees to make good decisions by mentoring and providing feedback, recognizing good performance, and motivating the team.
<i>Communicate to build a virtual culture of trust</i>	Build a virtual culture of trust by communicating rather than controlling, informing, and over-communicating.

Note. ¹Based on 155 diaries

Table 6: Definitions of the four remote leadership practices that are common during the COVID-19 pandemic.

RQ 2: Which digital tools do leaders use to support their different leadership practices?

In addition to the variety of leadership practices, the complexity of day-to-day leadership is shown by the diversity and suitability of digital tools used by leaders leading from home. The complexity of the day-to-day leadership practices is shown in our data by the challenge faced by the leaders in their choice of the right digital tool to match their objective. Additional indicators of complexity are using a combination of different tools and switching between tools, sometimes even in a single leadership task, for example:

“Very good and very interactive because the participants were able to ask questions in the live chat in parallel to the presentation” (Leader_27, Item 5, Day 4).

“A video conference would probably have been the most useful. But during the stressful day today, I thought I didn’t have time. So probably even more time was wasted with e-mail, phone calls and WhatsApp chat to solve the task within the team” (Leader_12, Item 16, Day 5).

“Since the goal, while using the digital tool increasingly, turned out to be unachievable, the e-mail writing was stopped, and I picked the mobile phone to call and solve the task in dialogue. In this situation, I realized too late that complex issues could not be clarified quickly and efficiently in communication via email” (Leader_03, Items 12 + 13, Day 5).

We use the four identified meta-categories to examine the variety and suitability of digital tools supporting day-to-day leadership practices. First, our findings reveal that when leaders show leadership practices related to the meta-category “solve problems collaboratively and monitor team progress”, they tend to feel confident about using a broad range of digital tools, such as video conferencing, screensharing, e-mail or collaboration tools. Some leaders who report these kinds of leadership practices tend to describe the use of digital tools as “routine” or “daily business”. In their diaries, they also mention their tendency to use the same digital tools when working remotely or in the office

for problem solving and monitoring leadership practices, since they have used digital tools for task management (e.g., JIRA) even before the global pandemic, for example:

“...the same tools – no difference between home office and work in the office; only difference: personal contact is not possible [when] working remotely” (Leader_18, Item 6, Day 1).

“If not working remotely, I would use digital tools in the same way because I work in a decentralized organization” (Leader_25, Item 6, Day 2).

Even if digital task management seems to work well remotely, the suitability is limited since the “human factor” is often missing, for example:

“The factual level can be handled very well, but the human factor is missing a bit [...]” (Leader_25, Item 8, Day 5).

Second, the diaries reveal that when leaders report leadership practices related to the meta-category “create space for socializing and teambuilding”, they tend to use video conferencing as the main digital tool. The diaries demonstrate the suitability of video conferencing for remote leadership since it enables leaders and team members to see one another and interact on a more personal level, for example:

“As a leader, I get to know my employees in their private environment and see their homes in the background during video calls. That brings me closer to the employees, and I also become more approachable – if, for example, the stepdaughter waves at the camera” (Leader_31, Item 8, Day 1).

“We decided to use Zoom for our team jour fixe since it allows us to meet in large groups, and participants can see one another via video” (Leader_02, Item 5, Day 2).

“Reaching and seeing the entire team at the same time was important for me; that’s why we used MS Teams with video” (Leader_31, Item 16, Day 1).

“Being able to see every one of the team via Zoom and keeping the team motivated through increased personal interaction” (Leader_11, Item 3, Day 1).

Furthermore, leaders report using additional digital tools, such as screensharing, conference calls, e-mail or messenger, to foster personal interactions within the team. They also mention using SharePoint as a data management tool to enable team collaboration. If not working from home, leaders report that they would meet in person without using any digital tools.

Third, the diaries reveal that leaders use video conferences or conference calls in combination with screensharing for the “make the team feel supported and encourage feedback” leadership practices such as mentoring or providing feedback. For giving due recognition to the team, messenger is used to quickly offer compliments on good work results. In their diaries, leaders ex-

plain that especially for (critical) feedback, they would assess personal meetings in the office as more suitable. One example reported in the diaries is the following:

“We used Skype VC and screenshare for an individual meeting with my mentee. This worked out quite well since we had direct face-to-face communication and were able to work on an action plan” (Leader_27, item 1, Day 2).

Fourth, the analysis of the diary entries related to the “communicate to build a virtual culture of trust” leadership practices show the leaders’ tendency to use different digital tools, such as video conferencing or messenger. Furthermore, the leaders find two-way communication more suitable for communicating changes. Again, they would prefer face-to-face meetings over technology-mediated communication, for example:

“For short-term communication of important changes, I used our standard messenger tool [Slack] to communicate fast. I felt very annoyed and disappointed, since it was a one-way communication with a lot of room for misunderstanding. This asynchronous communication was ineffective since my objective was only partially [achieved]. I would have definitely preferred a face-to-face meeting with my employees” (Leader_05, Items 10–13, Day 1).

To sum up, across all four meta-categories, leadership practices are shown with the support of a variety of digital tools, such as conference calls, collaboration tools, e-mail or screensharing, while video conferences should be emphasized as the most suitable tool for many remote leadership practices. However, except for task-oriented leadership practices, leaders would prefer face-to-face communication for all three relation-oriented categories.

RQ 3: What factors influence the effectiveness of leadership from home with the aid of digital tools?

Analyzing the diary data reveals that several factors have positive or negative impacts on leadership effectiveness when leading from home and using digital tools. Building on previous research, we define effective leaders as those who can “motivate and direct” their team members “towards organizational goals” and to “maintain stability and group harmony”, especially during change processes (Van Knippenberg & Hogg, 2003, p. 244). We summarize the positive and the negative factors under the terms ‘drivers’ and ‘barriers’, respectively. In the following sub-sections, we outline the key insights gained from the diaries, structured according to the four known meta-categories of leadership practices (see Table 7).

Meta-categories of leadership practices	Drivers	Barriers
Solve problems collaboratively and monitor team progress	<ul style="list-style-type: none"> ▪ Establish meeting guidelines ▪ Share digital notes 	<ul style="list-style-type: none"> ▪ Video cameras off ▪ Limited support of digital tools for creative and collaborative tasks
Create space for socializing and teambuilding	<ul style="list-style-type: none"> ▪ Personal interactions/seeing one another 	<ul style="list-style-type: none"> ▪ Missing opportunities for socializing
Make the team feel supported and encourage feedback	<ul style="list-style-type: none"> ▪ Ad hoc support 	<ul style="list-style-type: none"> ▪ Less opportunities for ad hoc feedback ▪ Technical difficulties
Communicate to build a virtual culture of trust	<ul style="list-style-type: none"> ▪ Over-communicating 	<ul style="list-style-type: none"> ▪ Asynchronous communication ▪ One-way communication

Note. Illustrative representation based on the 155 diaries.

Table 7: Findings about RQ 3 – Summary of qualitative analysis of key drivers and barriers related to leadership effectiveness.

Drivers of remote leadership effectiveness

When leaders describe “solve problems collaboratively and monitoring team progress” practices in their diaries, they highlight several experiences regarding effectivity. Many of their experiences can be summarized as constituting one key driver of remote leadership effectiveness – leveraging remote meetings requires sufficient preparation (e.g., defining the moderation role in a meeting). More precisely, establishing remote meeting guidelines or conference rules in advance contributes to effective leadership. Moreover, taking advantage of sharing digital notes supports effective leadership.

“The moderation and the conference rules contributed to this good outcome” (Leader_03, Item 5, Day 5).

“[...] the tool helped to clarify our well-prepared points” (Leader_08, Item 5, Day 1).

“See one another and write and share public notes” (Leader_06, Item 5, Day 1).

“We would have met in person and possibly only made handwritten notes [instead of digital notes], which would have been less efficient” (Leader_27, Item 6, Day 2).

The key driver identified regarding the meta-category “create space for socializing and teambuilding” constitutes personal interactions. Seeing one another in remote meetings seems highly relevant to effective socializing and

teambuilding. This driver is mainly related to video conferencing. Leaders describe situations where they are able to interpret their team members' communication and mood only when they see the latter's faces via video.

"Very good if both sides use video" (Leader_27, Item 5, Day 1).

"Being able to see every [member] of the team via Zoom and keeping the team motivated through increased personal interaction" (Leader_11, Item 3, Day 1).

One other key driver concerning the meta-category "make the team feel supported and encourage feedback" is revealed. When leaders are handling many things in parallel, providing ad hoc support via messenger increases effective leadership. Leaders can quickly react to questions or send feedback.

"We could clarify open questions in only a few messages in our chat, and I make sure to not be a bottleneck for my employees' progress on this important task" (Leader_13, Item 4, Day 3).

Another key driver related to the meta-category "communicate to build a virtual culture of trust" can be identified in the diary data. In cases of interactions with their employees, leaders mention that over-communicating contributes to leadership effectiveness. If possible, leaders communicate tasks or situations one more time, just to make sure to avoid misunderstandings.

"[...] all questions could be clarified; however, the communication [...] took longer than usual in a personal conversation" (Leader_12, Item 5, Day 3).

Barriers to remote leadership effectiveness

In addition to drivers, several roadblocks may arise when leading from home. Related to the meta-category "solve problems collaboratively and monitor team progress", based on our qualitative analysis, the key barrier is that in remote meetings, some employees tend to keep their video cameras off, which can lead to less engagement. When the video function is not or only partially used, there are less contributions in meetings, impairing leadership effectiveness. The leaders identify the digital tools' limited support for creative and collaborative tasks as an additional barrier to effective "solve problems collaboratively and monitoring team progress" leadership practices. Quite often, leaders report difficulties in using digital tools for more creative and collaborative tasks.

"That was actually the first time today that I had the feeling that employees via MS Teams like to sit back and step back from their responsibilities by turning off the camera" (Leader_31, Item 16, Day 5).

"[Using] MS Teams is difficult when creating a collection and working collaboratively within the entire team at the same time. For example, due to the amount of data, no

design ideas can be shared and evaluated together. So, in the creative field, I'm reaching my limits here" (Leader_31, Items 3 + 9, Day 1).

Regarding the meta-category "create space for socializing and team-building", missing opportunities for socializing is described as a main barrier to effective remote leadership. During busy days, when leaders find themselves in back-to-back meetings, the time for socializing is missing.

"Time for a private conversation with my employees during lunch break or after work beer is missing" (Leader_06, Item 14, Day 3).

Regarding the meta-category "make the team feel supported and encourage feedback" leadership practices, leaders identify having less opportunities for ad hoc feedback as another key barrier. Additionally, when working collaboratively in one document (e.g., to conduct quality assurance) and synchronization is not working in real time, the collaboration is ineffective.

"The meeting was not so effective. I wanted to give some feedback to my employee after the appointment. Usually, I do this when I leave the meeting room, but it didn't work that way [when] working from home. And after the meeting, I couldn't call because we both had follow-up meetings" (Leader_24, Item 13, Day 4).

"I felt stressed because the sync of our SharePoint was not working and some updates hadn't been saved" (Leader_27, Item 10, Day 4).

Another key barrier is identified in the diary data, related to the meta-category "communicate to build a virtual culture of trust". Asynchronous communication, as well as one-way communication, tends to be a barrier to effective remote leadership practices related to communicating change.

"To communicate important changes, I used Slack, which is an established tool in our organization. Unfortunately, the communication was not effective at all because there was no real-time dialogue possible. Also, it turned out to produce misunderstandings, and some employees did not even react at all to my message" (Leader_05, Item 12, Day 1).

In sum, the diary findings prove that the usage of every digital tool can contribute to effective remote leadership, depending on the leadership practice and the specific usage of the tool. Nevertheless, video conferences dominate across all leadership practices, as well as the usage of a combination of digital tools, rather than a single tool. Video conferencing allows attendees to see one another, have personal interactions and get a better sense of someone's mood. Moreover, employees are more engaged when their cameras are on, and two-sided communication with real-time interaction can take place. Generally, the diaries reveal that remote leadership tends to be more effective if

the decision about digital tool use is well considered, depending on the leadership practice. In this case, each digital tool or combination of digital tools can have a positive impact on remote leadership.

2.5 General Discussion

Theoretical implications

Our study offers several theoretical contributions to the scarce literature on the use of digital tools to effectively perform leadership practices while leading from home during a global pandemic. First, we use a trending study that has been set up based on longitudinal data from qualitative diaries and thereby classify remote leadership practices into four meta-categories: solve problems collaboratively and monitor team progress, create space for socializing and teambuilding, make the team feel supported and encourage feedback, and communicate to build a virtual culture of trust. Whereas the first meta-category is predominantly task-oriented, the other three are predominantly relation-oriented. Our study's findings indicate a focus on operational leadership practices related to task orientation, as well as a team-oriented focus with respect to "monitor team progress", "teambuilding" and "make the team feel supported". One explanation for the focus on the former might be the remote leaders' restricted ability "to monitor team member performance" and to solve problems due to the missing face-to-face interactions when leading from home (Bell and Kozlowski, 2002). These remote leadership challenges tend to cause the fear of loss of control and consequently, increase the pressure to maintain the operative business and closely monitor KPIs (Bell & Kozlowski, 2002). The focus on more team-oriented leadership practices (e.g., teambuilding) might result from the loss of the sense of belonging (Yarberry & Sims, 2021). When leaders work from home, they can contribute to teambuilding by ensuring that enough time is allotted to doing so and socializing, for example, building a shared view of objectives and commitment to a collaborative team culture (Holton, 2001). Virtual leaders find themselves in this position to maintain the team culture, motivate the team and create a shared goal commitment (Bell and Kozlowski, 2002). Virtual team work also benefits from an active feedback culture, which helps create a clear understanding of expectations and provides transparency

and support on individual and team levels, since in a virtual environment, employees cannot see what their colleagues are doing (Geister et al., 2006). Moreover, in new organizational arrangements, such as the abrupt home office situation, trust is a crucial element of virtual teams (Bell and Kozlowski, 2002; Jarvenpaa et al., 1998). Meaningful and frequent interactions create the fundament to build trust (Holton, 2001). Over-communication is identified as a key success factor for virtual teams (Hunsaker & Hunsaker, 2008). With the four identified meta-categories of leadership practices, we expand previous virtual and crisis leadership literature (e.g., Bell & Kozlowski, 2002) that has identified performance management and team development as the two key leadership functions in virtual teams. In line with Bartsch et al. (2020), we underpin the relevance of task and relation orientations in a virtual environment during a crisis, whereas our results emphasize the focus on relation-oriented leadership practices.

Second, we provide a detailed understanding about the support of digital tools for daily leadership practices while leading from home during the COVID-19 pandemic. For each of the four identified meta-categories, we outline which digital tools are used by leaders when leading from home. Thereby, we expand existing research stating that digital tools mainly contribute to problem solving and monitoring activities (Cortellazzo et al., 2019). Moreover, we explore the suitability of digital tools when leading from home. This analysis contributes to our understanding about the relations between leadership practices and leaders' decisions on digital tool usage and their corresponding suitability compared with previous ways of performing leadership practices in a non-home office context. Previous studies have outlined the use of digital tools as linked to organizational culture and digital readiness (e.g., Cortellazzo et al., 2019). Our study supplements these findings by revealing that remote leader working in decentralized or more agile organizations feel much more confident in using digital tools for task-oriented leadership practices, since they have often used digital tools for task management before. Moreover, research about leading virtual teams states that virtual leaders "need to be able to choose the right communication tool" (Cortellazzo et al., 2019, p. 14) and outlines the "importance of virtual leaders establishing media through which virtual teams can most effectively communicate and collaborate" (Hambley et al., 2007, p. 17). We find that leaders working from home use a variety of digital

tools but often feel uncomfortable with choosing the most suitable tool or combination of tools. Hambley and colleagues' (2007) findings about the suitability of managing more complex situations using synchronous communication are supplemented by our findings about the suitability of synchronous communication tools, especially for communicating changes when leading from home. Previous studies have acknowledged the increased complexity of leading virtual teams due to the lack of face-to-face communication (e.g., Purvanova & Bono, 2009). These findings are supplemented by our study's results, which reveal the suitability and particular use of video conferences to replace face-to-face communication when leading from home. In providing insights on the suitability of digital tools for remote leadership, we contribute to the scarce literature on leadership and technology.

Third, our paper contributes to research on effective leadership in a challenging and unpredictable context. Our study highlights several drivers of and barriers to leadership effectiveness while leaders try to cope with crisis-specific challenges. For each of the four meta-categories of leadership practices, our findings reveal which factors should be particularly considered for leadership effectiveness when leading from home during the COVID-19 pandemic. Previous research has declared a set of guidelines for virtual meetings as a critical success factor (White, 2014). This is supplemented by our findings that introducing conference rules and sharing digital notes contribute to effective leadership. Moreover, research about virtual leadership describes the lack of physical interaction as one of the main disadvantages of remote leadership (Bell & Kozlowski, 2002). However, our findings indicate personal interaction via video conferences as a motivator for employees and a contributor to effective leadership. Our study also explores the barriers. Recent research findings have revealed that during a lockdown, professional creativity does not increase, whereas everyday creativity significantly increases (Mercier et al., 2021). Concerning creativity in the professional environment, our findings indicate limited support of digital tools for creative and collaborative work. This can be a barrier to the meta-category "solve problems collaboratively and monitor team progress" (e.g., virtual brainstorming with employees). In general, the drivers and the barriers across all digital tools indicate that leaders' decision about which digital tool to use should be well considered. Research on virtual leadership states that less complex leadership practices "often require minimal

communication”; in this case, asynchronous communication (e.g., via e-mail or messenger/chat) would be sufficient (Bell & Kozlowski, 2002, p. 24). Conversely, for more complex practices (e.g., support and feedback), leaders might choose video conferences in combination with screensharing.

In sum, the diaries demonstrate that leaders experiment a lot with the use of digital tools, contributing to a broad range of leadership practices; sometimes, leaders even have to use work-around solutions. These findings can be explained by the sudden change to a remote work environment without being prepared or trained as leaders and employees; employees had to “quickly adjust to remote work environments” (Carnevale & Hatak, 2020, p. 183).

Managerial implications

Due to our detailed findings about the variety of remote leadership practices and the usage and suitability of digital tools, our study leads to specific suggestions for organizations and leaders to improve leadership effectiveness while working remotely during the COVID-19 pandemic. The study set-up, related to the critical incident technique with questions concerning leaders’ highlights and lowlights, allows us to provide a broad range of managerial implications. In total, we present six recommendations derived from the diaries, which we structure into task-oriented and relation-oriented leadership practices.

We first summarize three managerial implications related to task-oriented leadership practices. First, team commitment to standard tools for “solve problems collaboratively and monitoring team progress” (Mehtab et al., 2017; Zigurs, 2003), such as Jira for task management, Slack for informal alignments, and e-mail for documentation of meetings, can contribute to effectiveness and efficiency. Remote leaders should motivate their team members to jointly determine these standard tools and to regularly check whether these still fit (according to the organization’s data protection rules). However, leaders and team members must have the flexibility to choose digital tools according to their tasks and needs (Mehtab et al., 2017). Another potential benefit of committing to use standard tools is reducing negative emotions while using digital tools, such as feeling observed or controlled as a form of invasion of privacy. Hence, in regular one-on-one meetings, remote leaders should proactively discuss with their team members how each one feels about the usage

of digital tools when working from home. Moreover, to avoid employees' negative emotions, remote leaders should enhance their own "sensitivity to prevent misunderstandings and promote clarity in writing" when using digital tools (Zimmermann et al., 2008, p. 331).

Second, we recommend that leaders be aware that the more tools they use within the team, the more complex the daily set-up will be. To avoid too much fragmentation, effective leaders should better choose fewer digital tools with more functionalities (e.g., MS Teams for videoconferences, calls without video, individual chat, group chat). The use of digital tools during the COVID-19 pandemic requires a high learning curve for leaders, while promising much potential for a huge workplace transformation (Carnevale & Hatak, 2020; Larson & DeChurch, 2020).

Third, in line with White (2014), we recommend that leaders smartly organize their daily calendars (e.g., including enough breaks and alternating between seatwork and meetings), while keeping in mind that constant use of digital tools is tiring. Effective leaders should also save extra time in their calendars for meeting preparation and follow-up (White, 2014). Remote meetings need more preparation time to be efficient. Besides smartly structuring their own work days, leaders should proactively structure their employees' work days, for example, by starting each day with a stand-up meeting, where each team member talks about one's daily objectives. In this way, leaders would enable their employees to monitor their own performance (Hunsaker & Hunsaker, 2008), which would contribute to leadership effectiveness, as well as more transparency about the team's work progress.

We now present the next three managerial implications regarding relation-oriented leadership practices. Fourth, remote leadership should particularly support effective communication instead of control. Communicating effectively could be achieved by defining clear communication guidelines within the team and ensuring that everyone follows them (e.g., whether video is optional). Over-communication is especially recommended to build trust in change processes (Holton, 2001; Hunsaker & Hunsaker, 2008).

Fifth, to make their teams feel supported, effective leaders should take an active role in facilitating a meeting, engage their teams and encourage everyone to participate and contribute (Malhotra et al., 2007). Thereby, effective

leaders can ensure the smooth flow of the meeting and the inclusion of everyone's input. To facilitate an effective meeting, leaders are advised to set up and distribute a clear agenda in advance. During the meeting, leaders should play the moderator's role, ask questions, and guide the attendees through the agenda.

Sixth, to improve socializing and teambuilding, effective leaders should make sure to set up virtual coffee breaks or team lunches and give their teams room for chatting about non-work-related topics. Sometimes, small gestures, such as using the start of a meeting for social relationship building (Malhotra et al., 2007), can have a significant beneficial impact on employees' mood and commitment.

Limitations and future research

While our in-depth analysis of 155 qualitative diaries has allowed us to gain deep insights into the daily challenges that leaders face during COVID-19, some limitations of this paper should be addressed in future research. First, the results are based on leaders who have mainly office jobs (e.g., financial services) and are thereby able to work remotely. According to Bauwens et al. (2021), context matters when determining trends in leadership research. Existing research mainly focuses on sectoral contexts, such as public healthcare or education, where COVID-19 has a huge impact on daily work (Bauwens et al., 2021); other sectors are so far underexplored. Our study sample covers a range of less explored sectors, such as financial services, law, real estate or automotive, which have high economic relevance. The sample's focus on financial services (48%) might lead to a potential sector bias, which should be reduced in further studies. However, Willemse et al. (2020) reveal that during the pandemic, even financial service companies and their leaders are challenged to work in less hierarchical and more collaborative virtual teams, which is one indicator of a minimized sector bias. To conclude, our study results are likely to be transferable to other industries and their leaders as well since COVID-19 has accelerated the digital transformation of different sectors (Iansiti & Richards, 2020). However, future research could concentrate on a larger sample from a broader range of industries (e.g., including blue-collar jobs) and explore the impacts of the COVID-19 pandemic on leading their re-

spective employees. Moreover, it would be interesting to investigate companies that have not previously used many digital tools for task management, so the pandemic has caused a huge change of their daily routines when working from home.

Second, the voluntary participation in the diary study means a high self-selection of the participants, since diary studies require a high commitment level over several days. Since our study participants are leaders, who typically have little spare time, their high commitment has been especially required. Thus, researchers could consider including employees in future studies to understand how working remotely would affect them as well.

Third, the diaries have encouraged the leaders to reflect on daily situations that they would usually not think about. This could lead to a reporting of experiences that might be, to some extent, shaped by the participants (Poppleton et al., 2008). However, this limitation is not exclusive to the qualitative diary method but also exists in interviews or questionnaires (Poppleton et al., 2008). Our recommendation for future research would be to use an ethnographic research design, such as participant observation (Ejimabo, 2015), to avoid these limitations, although we are aware of the challenges associated with such a research design. In sum, future research could continue exploring leading from home during a crisis. Especially, leadership in collaboration with digital tools opens an extensive research field. It could be interesting to explore the work environment after the global COVID-19 crisis to understand how the use of digital tools would affect the new normal.

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3. Appendix

Appendix 1: Structure of the daily diary – highlight of the day.	67
Appendix 2: Structure of the daily diary – lowlight of the day.	67

Appendix 1: Structure of the daily diary – highlight of the day.

Please describe a leadership situation in which the use of digital tools **did support** your desired result. *#highlight*

- (1) Which digital tool(s) did you use?
 - (2) For which leadership practice(s) did you use the mentioned digital tool(s)?
 - (3) What was your motivation/the reason for using the mentioned digital tool(s)?
 - (4) How did you feel while using the mentioned digital tool(s)?
 - (5) How effective was the use of the digital tool(s)? (How well/completely was the corresponding leadership task performed with it? How did the digital tool contribute?)
 - (6) How would you have performed the leadership practice if you had not been working from home? What digital tools would you have used?
 - (7) Do you have any additional remarks?
-

Appendix 2: Structure of the daily diary – lowlight of the day.

Please describe a leadership situation in which the use of digital tools **did not support** your desired result. *#lowligh*t

- (1) Which digital tool(s) did you use?
 - (2) For which leadership practice(s) did you use the mentioned digital tool(s)?
 - (3) What was your motivation/the reason for using the mentioned digital tool(s)?
 - (4) How did you feel while using the mentioned digital tool(s)?
 - (5) How (in)effective was the use of the digital tool(s)?
 - (6) How would you have performed the leadership practice if you had not been working from home? What digital tools would you have used?
 - (7) Do you have any additional remarks?
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4. Full List of References

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Declarations of Co-Authorship



KO-AUTORENERKLÄRUNG *DECLARATION OF CO-AUTHORSHIP*

(Für kumulative Dissertationen)

Name des Kandidaten:

(*Name of the candidate*)

Eva-Helen Krehl

Titel des Artikels (*Title of the article*):

Uncovering the complexities of remote leadership and the usage of digital tools during the COVID-19 pandemic – A qualitative diary study

nicht eingereicht (*not submitted*)

eingereicht bei (*submitted to*):

Zur Veröffentlichung angenommen oder veröffentlicht in (*accepted for publication or published in*):

German Journal of Human Resource Management (GHRM)

Arbeitsanteil des Kandidaten an vorgenanntem Artikel *Quantification of candidates contribution to the article (overall)*:

hat zur Arbeit beigetragen/has contributed to the work (<1/3)

hat wesentlich zur Arbeit beigetragen/has made a substantial contribution (1/3 to 2/3)

hat einen Großteil der Arbeit allein erledigt/did the majority of the work independently (>2/3)

federführender Autor/lead author

Ko-Autoren *Co-authors* (Name und Kontaktdaten/*full name; contact*):

1.

Prof. Dr. Marion Büttgen, Universität Hohenheim, Fg. Betriebswirtschaftslehre, insb. Unternehmensführung, Schwerzstr. 42, 70599 Stuttgart, m.buettgen@uni-hohenheim.de

2.

3.

4.

Hiermit bestätige ich die Richtigkeit des oben beschriebenen Arbeitsanteils des Kandidaten.

I hereby confirm the candidate's contribution as quantified above.

S-Hohenheim, 19.07.2021

Ort, Datum *Place, Date*

Unterschrift Ko-Autor *Signature Co-author*