

# A Literature Review on Digital Leadership Capabilities

*Seminar paper*

Lagemann, Julien, FH Wedel, Wedel, Germany, bwl105562@stud.fh-wedel.de

## Abstract

*It is widely recognized that digitization has a significant impact on the business environment. Digital disruption is turning entire industries upside down and posing new challenges for almost all companies. To remain competitive companies are required to transform their business strategies. Although Digital Leadership (DL) plays an important role in overcoming these challenges most organizations are not aware of its importance. As the current literature does not provide a comprehensive understanding of DL, there is also a lack of understanding of what digital leadership capabilities are required to meet the challenges of digitization in organizations of the digital age. Therefore, the objective of this paper is to explore the capabilities of DL by undertaking more in depth-research by conducting a systematic literature review. Using a grounded theory approach, the final analysis of 30 papers identifies capabilities along the dimensions of mindset, behavior, culture, and technology with corresponding subcategories. This study raises awareness of DL capabilities, especially among those with leadership and decision-making responsibilities and contributes to both IS and organizational research.*

*Keywords: Digital Leadership Capabilities, Digital Transformation, Systematic Literature Review, Research Agenda*

## Table of Contents

<b>1</b>	<b>Introduction</b> .....	<b>2</b>
<b>2</b>	<b>Method</b> .....	<b>3</b>
<b>3</b>	<b>Results</b> .....	<b>4</b>
	3.1 Mindset .....	5
	3.2 Behavior.....	6
	3.3 Culture .....	8
	3.4 Technology .....	9
<b>4</b>	<b>Discussion</b> .....	<b>10</b>
<b>5</b>	<b>Conclusion</b> .....	<b>11</b>
	<b>Appendix</b> .....	<b>13</b>
	<b>References</b> .....	<b>14</b>

## 1 Introduction

Increasing digitization is rapidly changing today's business world as digital disruptions are upending entire industries, forcing almost all organizations to adapt to the new rules of business (Kohnke 2017; Kane 2019; Araujo et al. 2021). This poses major challenges for companies, as they must constantly adapt their business strategy to remain competitive (Mihai and Crețu 2019). They are called upon to introduce new business models, integrate new digital technologies, change their organizational structure, and bring their employees along in the change (Ehmig-Klassen and Schallmo 2021; Schiuma et al. 2021). Therefore, new competencies, skills and forms of leadership are needed (Kohnke 2017; Kane et al. 2019). DL is an important factor to overcome these challenges and to secure sustainability (e.g. Gupta 2018; Promsi 2019; Gudergan et al. 2021; Erhan et al. 2022). However, most organizations are unaware of its importance (De Villiers et al. 2021). Even in research there is no uniform definition of DL. A comprehensive view on the literature shows that fuzziness exists in providing a common understanding. On the one hand some researchers describe DL more from practical point of view. For instance, as the leadership approach suitable for the digital age (Meffert and Swaminathan 2018; Von Ohain 2019), the leading of digital organizations depending on its digital maturity level (Bawany 2019), the calculated use of digital assets to archive business goals (Breuer and Szillat 2019), or with association to digital transformation more general as “doing the right things for a successful digitalization of organizations” (Sawy et al. 2016, p. 142). Regarding digital maturity Klein (2020) adds, that DL must be understood from different perspectives, either as leading the company's digital transformation process or as leading an already digitized organization. On the other hand, scholars such as Abbu et al. (2022) classify DL from a theoretical perspective as a combination of authentic leadership, transactional leadership, and transformational leadership. As addressed by Eberl and Drews (2021), ambiguities are also found in the distinction between e-leadership and DL. While Avolio et al. (2000, p. 617) first described e-leadership as “a social influence process mediated by advanced information technologies to produces change in attitudes, feeling, thinking, behavior and/or performance of individuals, groups, and/or organizations”, other scholars such as Klus and Müller (2021) use e-Leadership and DL synonymously. In reviewing the literature, what became apparent is that DL is used to describe two different levels of leaders, either the organization or the individual leader. As with DL in general, there is no commonly accepted understanding of DL capabilities (Hearsum 2015). However, most of the prior publications concern to DL on an organizational-level by emphasizing that contemporary leadership requires for example organizational shifts, business-model choices, and strategic capabilities. In contrast, a critical elaboration on what capabilities an individual person needs to lead an organization in today's world is less evident. To address this research gap, the objective of my research is to shed a light on critical DL capabilities by also taken the individual-level into account. My research was guided by the following research question: What capabilities does a digital leader need to successfully master the challenges of digitization in contemporary organizations? Based on the lack of common scholar understanding of DL I ground my research work on the appropriate leadership necessary to lead an organization in a digital environment. Both perspectives are considered, either a company in the digital transformation process or the management of an already digitized company. Compared to the prior research the contribution of this study can be stressed as follows. First, although some papers have been published on DL, prior research did mainly concentrate on the capabilities of an organization, not on capabilities an individual leader must possess. Although there is a recently presented nomological network in relation to DL from Eberl and Drews (2021), it considered leadership skills only as a marginal part of the paper. Hence, this study differs as it provides a more differentiated view and broader research on the specific leadership capabilities. Moreover success factors, and the effects of applying identified capabilities will be addressed. Second, new studies are constantly being added to the field of research. This also warrants an examination of the organizational level as existing findings may be limited in their information value. For example, the ubiquity of the corona crisis with the increase of virtual teams and new work designs makes additional research relevant. Third, due to the fast-changing development and implementation of digital technology, there is a need to continuously update and consider the latest contributions to this topic. As also addressed by several researchers from the similar research field in their future research directions, DL is quickly evolving phenomena, which needs further investigations for practice (e.g. Klus and Müller

2020; Eberl and Drews 2021). I tie in with suggestions by contributing new insights to the leadership literature and deriving practical implications. Therefore, I examine recent publications from IS and leadership research. The remainder of this paper is structured as follows: First, I describe the methodological approach used for the literature review. Second, I present the findings of the review process including the categories identified. Finally, I describe practical implications of my findings, present limitations and propose directions for future research before I conclude.

## 2 Method

The aim of this paper is to provide an overview of what capabilities were identified as important for digital leaders by research in recent years. Therefore, I identify key findings, build dimensions, and propose potential future directions of research. In doing so, I undertake a comprehensive review using a systematic procedure. This ensures to review relevant articles in a traceable, reproducible way, based on a concrete research question (Kitchenham et al. 2009). I decide for this procedure as the research field of DL is understudied. With this work I provide future researchers the opportunity to incorporate new results in a coherent way, for example more recent ones, results from other databases or results obtained from a varying search method. I followed the approach of Wolfswinkel et al. (2013) dividing the research process into a structured literature search, a literature selection, and a qualitative analysis. In the following I describe these parts in more detail.

### Literature Search:

For the literature search I have chosen the process recommended by Webster and Watson (2002). I started my literature search by examining the keywords “Digital Leadership”, “Digital leader” and "Digitalization" AND "Leadership". I originally started the search with the keyword "Digital Leadership Capabilities," but as I progressed, I realized that this was redundant because the articles identified were also included in the results for the search term "Digital Leadership." I searched general databases (EBSCO Business Source Complete, ScienceDirect, Google Scholar, Emerald Insight) and specialist IS sources (AISEL, IEEE Xplore) by inserting the search terms. To ensure a consistent procedure the search in each database was produced in title, abstract or keywords. Because Emerald Insight did not provide to search in keywords, only the title and abstract were searched here. With Google Scholar, only the title could be searched due to the lack of advanced research. In order to ensure traceability of the search results I documented the relevant results in a research table. I only collected papers, which were consistent with the scope and purpose of the literature review. Due to the volume of search results and to ensure the quality of the results, the search was limited to conference papers and articles only. Moreover, I did not take non-English papers into account. For the sake of transparency, I first compiled information about the search in the research table, such as which search term was used, which search field was used, and which database was searched. Furthermore, I added general data regarding the paper such as article title, year, authors, publication type, publishing outlet, JQ3 VHB rank and the access status. In total, I have compiled information on 64 papers in the research table.

### Literature Selection:

Within the literature selection I filtered the initial literature in three steps to select appropriate papers only. First, as I conducted the search in multiple redundant databases, I identified duplicates and removed them afterwards. In total 13 papers had to be removed, which reduced the initial dataset from 64 papers to 41 papers. Second, I checked the papers where I could not directly access the full text. In some cases, I was able to contact the corresponding authors via ResearchGate, who then granted me access to the full text. Nevertheless, from my initial search table eight papers more must have been deleted due to the lack of full-text access. Finally, I examined each paper regarding the relevance for this literature review. I first checked the title and keywords of each paper, before I read each abstract a lastly examined the body of selected papers. To evaluate the relevance of each paper I formulated following exclusion criteria: 1) Not consistent with the scope and purpose of the literature review 2) Not peer-reviewed journal or conference 3) Outdated research 4) Non-commercial context in focus (e.g. education) 5) Certain industry or country in focus. I evaluated each work based on these criteria. In doing so, I ensured that only sources with a substantive relation to the research were processed in the following. Applying

this process 14 papers were removed, which reduced the initial dataset to 19 papers. After completing these steps I performed a forward and backward search following the approach of Webster and Watson (2002). Within backward search papers cited by the authors of the literature I initially identified are considered. In the forward search, I searched the databases for articles that cited the literature I had previously found. I reviewed these papers against the exclusion criteria described above to determine whether they should be considered. In this way, three additional papers from the forward search and eight papers from the backward search were added to the research table. After this selection procedure a total of 30 works were compiled from 2016 to 2022, with 80% spread over 2019 to 2022, reflecting the timeliness of this research field. The final data set consists of 23 Articles and seven conference proceedings. An overview of the publication outlets and years can be found in the appendix (Appendix 1).

### **Qualitative Analysis:**

To prepare the qualitative analysis I first added additional information to the research table for the selected studies. Therefore, I checked each source and collected information such as purpose, central statements, method, qualitative/quantitative, sample size, DL definition and DL perspective (organization-level/individual-level). This allowed me to gather a more detailed overview of the data collection. For analyzing the studies, I used the grounded theory recommended by Wolfswinkel et al. (2013). Accordingly, I have divided the analysis into three sequential coding processes. In this way, I was able to identify connections and inconsistencies within the various studies and expand my knowledge of the research subject. First, I applied open coding by conceptualizing any findings from the text that seemed relevant to the review's research question. I read each paper and generated abstract codes for relevant text excerpts. Second, I performed axial coding, by grouping the codes into categories. In this way relations between different categories within the data set were formed. Third, I proceeded selective coding, by refining the categories from step two and linking them to dimensions. To ensure the traceability of the analysis process, I used the before mentioned research table to collect every code relating to the different studies. Moreover, I have also summarized the codes in a conceptual map to clarify the connections.

## **3 Results**

The final data set for the analysis comprises 30 papers. The report by Sawy et al. (2016) on how LEGO built enterprise capabilities in the journal MIS Quarterly Executive represents a milestone in the research field of DL. A total of 19 papers within the final sample examined DL from an individual perspective, while 11 papers focused on the organizational level, in which individual capabilities were a small part of the study, if at all. To reiterate with Klein (2020), this reveals a greater urgency to understand the role of digital leaders in guiding organizations within the digital transformation process. It confirms that it is becoming increasingly important to understand what capabilities are crucial for leaders to run organizations in digital environments. Throughout the analysis, I identified following four relevant dimensions which are relevant to master the challenges of digitization in contemporary organizations: 1) Mindset, 2) Behavior, 3) Culture, 4) Technology. Since I decided for a concept-centric literature review, I visualized an overview of the findings in a concept matrix (Table 1). In the following sections, I will present a more differentiated view on these dimensions and explain which digital leader capabilities are to be classified under each of the dimensions. For this purpose, I present the dimensions with their respective subcategories. Within the subcategories, I will also address which capabilities were highlighted by the researchers, address success factors, and the effects of applying those capabilities.

<i>Reference</i>	<i>Mindset</i>	<i>Behavior</i>	<i>Culture</i>	<i>Technology</i>
Abbu et al. (A)	•	•	•	•
Abbu et al. (B)	•	•		•
Araujo et al.	•	•		
Bach and Sulíková	•			•
Bolden and O'Regan		•	•	•
Breuer and Szillat	•	•		•
Cortellazzo et al.	•	•	•	•
Da Silva et al.	•			
Drews and Eberl	•		•	
Fernandes et al.	•		•	
Gierlich-Joas et al.			•	
Hensellek	•	•	•	•
Hesse	•		•	•
Junior and Cabral	•	•		•
Kane	•		•	•
Kane et al. (A)			•	•
Klein	•	•	•	•
Klus and Müller	•	•	•	•
Kocak and Pawlowski	•	•		•
Larjovuori et al.	•	•	•	
Larson and DeChurch	•	•		•
McCarthy et al.	•	•	•	
Mugge et al.	•	•	•	
Ngayo Fotso		•		
Von Ohain	•	•		•
Sawy et al.	•	•	•	•
Schwarz Müller et al.	•	•	•	•
Sousa and Rocha´	•	•	•	•
Underwood	•	•	•	•
Weber et al.	•		•	

Table 1. *Concept matrix*

### 3.1 Mindset

During the analysis, several DL capabilities were identified that relate to the general mindset a digital leader must possess. The capabilities relate to the vision and emotions of digital leaders, which I will describe in more detail below.

#### **Vision:**

Nearly every reviewed paper addressed the need for digital leaders to formulate a strategic digital or transformative vision, which is also demonstrated through the frequency in the concept matrix (e.g. Hesse 2018; Kane 2019; Von Ohain 2019; Abbu et al. 2020; Junior and Cabral 2020; Eberl and Drews 2021; Kocak and Pawlowski 2021; McCarthy et al. 2021; Fernandes et al. 2022). On the one hand, such a vision is essential to enable innovation within an organization (Breuer and Szillat 2019; Fernandes et al. 2022). On the other hand, it helps to better counter the challenges of the VUCA environment

(Volatile, Uncertain, Complex and Ambiguous) in the form of volatility. A digital vision should be clearly articulated, accepted by employees, ambitious to compete internationally, address all areas of an organization, and consider other stakeholder groups (Larjovuori et al. 2018; Underwood 2019; Hensellek 2020). It must be designed with the future in mind and ideally cover a time frame of 10 to 20 years (Kane 2019). However, a recent empirical study by Weber et al. (2022) found that great caution should be exercised when formulating a digital vision as challenging wording or continuously emphasizing can lead to negative emotions toward digital transformation, reduced affective trust and innovative work performance, and greater resistance to organizational change. When developing a vision, a high level of individual commitment and clear communication of direction throughout the organization is important (Sawy et al. 2016; Mugge et al. 2020; Klus and Müller 2021). In addition, the necessary resources must be made available for the strategic implementation of the vision. Furthermore, a digital mindset and providing purpose is of great importance for the future vision (Hensellek 2020; Araujo et al. 2021; Bach and Sulíková 2021; Kocak and Pawlowski 2021).

#### **Emotion:**

To enable a culture that is adapted to the environment of the digital age, digital leaders must have capabilities related to their own emotions. Some scholars use the term "emotional intelligence" in this context, which is necessary for the motivation and effectively management of subordinates (Cortellazzo et al. 2019, p. 13; Underwood 2019, p. 234) and therefore a prerequisite for team empowerment. However, as Da Silva et al. (2019) noted in the context of information systems projects, emotional capabilities are relevant not only to interactions with employees, but to all stakeholder groups in the organization. As described in the literature, emotional intelligence is also related to the social skills that a leader must possess. The use of social awareness and the development of relationship skills enable the formation of work teams that reach their full potential (Sousa and Rocha 2019; Larson and DeChurch 2020). Since digital transformation processes often bring together different social groups, digital leaders must balance these groups through social intelligence (Klein 2020). The capability to work with heterogeneous teams is highly important, which sometimes requires sufficient intercultural or language capabilities, for instance when dealing with virtual or global teams (Schwarz Müller et al. 2018; Sousa and Rocha 2019). Interpersonal bonds are less likely to form in dynamic and intercultural teams (Cortellazzo et al. 2019). Therefore, team building reveals as critical capability to effectively manage diverse team structures (Schwarz Müller et al. 2018). Furthermore, a successful digital leader is emphatic (Von Ohain 2019; Abbu et al. 2022). A positive attitude to express emotionalizing responses such as recognition, gratitude, and praise was emphasized in terms of a successful leader. Overall, such leaders prove to be more resilient and socially integrated and have greater flexibility and creativity (Abbu et al. 2022). In terms of resilience the capability to manage stress is required as modern work environments require greater availability and involve increased workloads and more frequent decision-making (Schwarz Müller et al. 2018). Finally, self-awareness was also mentioned to rely on instinct and trust oneself in critical moments (Breuer and Szillat 2019; Klein 2020).

### **3.2 Behavior**

There are several capabilities described in the literature concerning the behavior of digital leaders. These relate to entrepreneurial action and the involvement of networks. I will take a more differentiated view in the following.

#### **Entrepreneurial action:**

Several authors have recognized that a leader's behavior is characterized by its entrepreneurial thinking and acting (e.g. Abbu et al. 2020; Junior and Cabral 2020; Mugge et al. 2020; Klus and Müller 2021). A digital leader has the capability to constantly expand his knowledge (e.g. Schwarz Müller et al. 2018; Cortellazzo et al. 2019; Hensellek 2020; Larson and DeChurch 2020; Araujo et al. 2021). Keywords used by scholars in this context were for example, "continuous learning", "life-long learning" or "knowledge-orientated" which I assessed as synonyms (Breuer and Szillat 2019, p. 30; Klein 2020, p. 899; Kocak and Pawlowski 2021, p. 58). The application of new methods (Abbu et al. 2020) and openness to new technologies was also pointed out. Nevertheless, Hensellek (2020) addressed, that it is

worthwhile to discuss how far openness and trust in digital technologies must go. Anyways, as revealed by several authors a high degree of adaptability is required to meet the constantly changing market structures (e.g. Bolden and O'Regan 2016; Cortellazzo et al. 2019; Sousa and Rocha 2019; Underwood 2019; Araujo et al. 2021; McCarthy et al. 2021). To realize this, flexibility is decisive (Hensellek 2020; Klus and Müller 2021). In terms of technology use leaders must stay up to date on new innovations and communicate its functionality to the team (Von Ohain 2019; Larson and DeChurch 2020). Furthermore, the openness to exploit new business opportunities was mentioned (Sousa and Rocha 2019; Von Ohain 2019). The capability to act quickly and flexibly was subsumed under agility by some researchers (Underwood 2019; Klein 2020). Creativity was identified as an elementary capability to drive innovation (Schwarz Müller et al. 2018; Sousa and Rocha 2019; Klein 2020; Klus and Müller 2020; Larson and DeChurch 2020; Kocak and Pawlowski 2021). Furthermore, problem-solving orientation and rapid decision making were also cited as key factors that constitute agility (Larjovuori et al. 2018; Schwarz Müller et al. 2018; Breuer and Szillat 2019; Cortellazzo et al. 2019). A digital leader should be capable in the management of multi-tasking (Junior and Cabral 2020; Klus and Müller 2021) and think both strategic and analytic as these are crucial elements of entrepreneurial thinking and acting to enable continuous improvement (Klus and Müller 2020; Kocak and Pawlowski 2021). Some authors also drew the line to the VUCA environment by highlighting the accomplishment of complex tasks as another capability (Schwarz Müller et al. 2018; Cortellazzo et al. 2019; Klein 2020). Also risk-taking was reported in this concern as critical capability that differentiates leaders in the modern world from others as the business environment becomes increasingly uncertain and ambiguous (e.g. Bolden and O'Regan 2016; Sawy et al. 2016; Larjovuori et al. 2018; Sousa and Rocha 2019; Abbu et al. 2020; Kocak and Pawlowski 2021). A digital leader must be able to take prudent risks, fail quickly, continue, and learn to develop. Therefore, it will be critical to build capabilities that are suited for the future, not past challenges (Bolden and O'Regan 2016). The importance of a competitive mindset was not demonstrated throughout the literature (Kocak and Pawlowski 2021). Rather, a digital leader must be able to anticipate innovative business models (Klein 2020) and foster its own innovation process by creating an appropriate culture (Sousa and Rocha 2019; Underwood 2019), which more information can be found in the section "Culture".

#### **Network involvement:**

According to the literature, a supplier-centric approach seems no longer sufficient, as customers define the products and services in today's world. Consequently, DL is more about responding to customers' needs than just delivering goods (Larjovuori et al. 2018). Research confirms that it is becoming increasingly important to follow a customer-centric approach (Sawy et al. 2016; Breuer and Szillat 2019; Hensellek 2020; McCarthy et al. 2021). Processes and products should be effectively aligned with the end customer (Von Ohain 2019). A key factor here is that digital leaders care deeply about customer experience (Ngayo Fotso 2021), customer service and the overall customer competence (Kocak and Pawlowski 2021). In addition to customer-orientation, the role of business collaborations and partnerships was also highlighted in the literature (Sawy et al. 2016; Larjovuori et al. 2018; Mugge et al. 2020). Researchers revealed that the capability to build strategic networks with partners is of great importance (Kocak and Pawlowski 2021). A number of researchers, associate "collaboration" with building partnerships or networks, for example with technology providers, customers, or other stakeholders (Sawy et al. 2016; Sousa and Rocha 2019; Underwood 2019; Mugge et al. 2020). To innovate and respond to ever-faster changing customer needs, digital leaders must take a collaborative development approach, by generating new ideas from communication with customers, suppliers, and business partners (Mugge et al. 2020; McCarthy et al. 2021). Partnerships are also valuable in terms of co-creation, as it pays to leverage partners' complementary knowledge to keep up with rapid digital developments or to enhance business model opportunities (Sawy et al. 2016; Larjovuori et al. 2018). A digital leader is expected to be present online and to communicate with various stakeholders, for instance, through interaction via digital tools or social media (Cortellazzo et al. 2019).

### 3.3 Culture

Another building block mentioned for digital leaders was the capability to shape an organizational culture appropriate to the digital age. The following section presents a more differentiated view about what is crucial for digital leaders in this context. The section is divided into employee empowerment and people management.

#### **Employee empowerment:**

Most authors have elaborated that a digital leader must be capable to shape a cultural change as this is a key factor for enabling innovation (e.g. Larjovuori et al. 2018; Underwood 2019; Hensellek 2020). This includes, for instance, the motivation and the promotion of employee participation (e.g. Sousa and Rocha 2019; Hensellek 2020; Klein 2020; Klus and Müller 2021). Employees who are empowered tend to be more cooperative (Gierlich-Joas et al. 2020). In this respect, digital leaders are also increasingly expected to incorporate the opinions of their teams into decision-making. Decisions should be based on collective intelligence, leading to divide leadership responsibilities among the team. Therefore, digital leaders need to grant their team a great piece of autonomy (Larjovuori et al. 2018). Whereas traditional leaders were also responsible for determining how goals would be achieved, digital leaders are only responsible for setting goals, while employees decide how to achieve them (Hesse 2018; Schwarzmüller et al. 2018). A digital leader must be capable to delegate decision authority (Sawy et al. 2016). In this context, the term "collaboration" has been used by several authors to describe a cooperative relationship between a leader and subordinates (e.g. Kane 2019, p. 48; Fernandes et al. 2022, p. 4). Trust was found as a prerequisite in making joint decisions with followers. Moreover, transparency can lead to a significant reduction in resistance to change, as employees are able to form their own rational judgment about the opportunities and risks of potential changes (Abbu et al. 2022). It is also reported that inspiration can promote intrinsic motivation and lead to better performance (Schwarzmüller et al. 2018; Eberl and Drews 2021). However, for cultural change it is not only important to consider employees, but ideally external stakeholders such as suppliers and customers should also be considered, with the digital leader acting as a role model (Cortellazzo et al. 2019; Sousa and Rocha 2019; Hensellek 2020; Klein 2020). To empower employees, it is important that digital leaders create a culture of failure, as this is strongly emphasized in the literature. The following terms were mentioned in this concern for example: "learning from failure, "learning to fail" and "learning from errors" (Bolden and O'Regan 2016, p. 4; Larjovuori et al. 2018, p. 7; Klein 2020, p. 898). Accordingly, digital leaders must be able to accept failure and deal with it transparently, in a constructive way that benefits everyone in the organization (Sawy et al. 2016).

#### **People Management:**

A digital leader is capable to identify, attract, recruit, develop and retain skilled people (Bolden and O'Regan 2016; Sawy et al. 2016; Cortellazzo et al. 2019; Kane 2019; Sousa and Rocha 2019; McCarthy et al. 2021). As revealed by Kane et al. (2016), digital mature organizations successfully integrate their talent management within its overall digital strategy. Meeting the demands of the digital world requires dynamic and adaptable employees who can deal with changing tasks and positions (Cortellazzo et al. 2019). Moreover, Mugge et al. (2020) found, that digital leaders invest in trainings to give their employees the skills they need to meet the challenges of the digital environment. Furthermore, digital leaders must act as digital talent scouts, by creating an attractive workplace for digitally savvy people, winning over talents which enable new digital capabilities (Sawy et al. 2016; Klein 2020). The interpersonal level must not be neglected either. Leaders might engage in more personnel development to help their employees cope with increased job demands such as higher competency requirements or challenging work-life dynamics. From theoretical point of view, a key difference between traditional leadership and leadership in digitalized business environments is a relationship-based leadership approach, which is becoming increasingly important. Leaders must be able to support them in their development and success in their work (Larjovuori et al. 2018; Larson and DeChurch 2020). In this respect, a leader is asked to considerate employee's needs individualized (Schwarzmüller et al. 2018). Digital leaders support their employees and address their needs accordingly to reduce negative emotions or resistance related to rising organizational dynamics occurring in the digital transformation (Weber et al. 2022). They take the position of a motivational coach by addressing employees' fears, providing constructive criticism,



and encouraging them to adapt to changing working conditions and increasing demands (Klein 2020; Fernandes et al. 2022). Some researchers take one more step beyond stating that the organization should be build employee-centric (Gierlich-Joas et al. 2020; Hensellek 2020; Klein 2020). Overall, the importance of a careful people management was highlighted in an interview with Rick Haythornthwaite, former chairman of Centrica and MasterCard, who said regarding future of leadership: "The one immutable truth of leadership is that people really matter." (Bolden and O'Regan 2016, p. 7).

### 3.4 Technology

Technological capabilities were considered rather marginal throughout the literature. However, in the following section, I will provide an overview of what technological capabilities were mentioned in the context of leadership. The section is subdivided in digital literacy and the use of digital tools.

#### **Digital Literacy:**

There exists a considerable body of literature on reporting about the importance of digital literacy (e.g. Junior and Cabral 2020; Bach and Sulíková 2021; Kocak and Pawlowski 2021; Abbu et al. 2022). Other terms found in similar context are for example "digitally savvy", "digital skillset", "digital technology skills" (e.g. Bolden and O'Regan 2016, p. 7; Hensellek 2020, p. 62; Junior and Cabral 2020, p. 4). However, there is neither a common understanding of the various terms nor any idea of how far the technological capabilities of digital leaders need to go. In his conceptual framework Hensellek (2020) understands digital skills as the skills required to understand digital technology, to handle it as easily as possible, and to use it meaningfully, by always balancing the associated opportunities and risks. In contrast Abbu et al. (2020, p. 3) defines the "preexisting experience and knowledge about digital technologies" as "digital literacy". To give one more example both Abbu et al. (2020) and Mugge et al. (2020) studied companies with different levels of maturity in implementing digital transformation and concluded that digitally mature companies are likely to have leaders with extensive technological expertise who make decisions less from intuition and more based on data. The extent to which technical expertise is required should be discussed. What remains is widespread recognition that digital leaders need to understand the business value of technologies and how they can shape the organization, for instance, in terms of applying artificial intelligence, virtual reality, data analytics, data science, or blockchain (Schwarz Müller et al. 2018; Breuer and Szillat 2019; Kane 2019; Sousa and Rocha 2019; Underwood 2019; Hensellek 2020). Digital leaders must be able to efficiently integrate digital technologies into the daily business of both themselves and their employees (Hensellek 2020). Furthermore, as mentioned by Von Ohain (2019), digital leaders are likely to be technology-oriented in trying out innovative technical solutions. However, they are not expected to develop algorithms or perform big data analytics (Kane 2019). Although new technologies are constantly being introduced, most can be learned, and the essence of the business acumen remains. For instance creating an understanding of the customer and acting entrepreneurial are more important than possessing a particular technological capability (Breuer and Szillat 2019; Underwood 2019; Kocak and Pawlowski 2021). IT skills will be increasingly in demand in the future due to the emerging businesses driven by IT such as Internet of Things, Cloud, Big Data, Artificial Intelligence, and robotics (Sousa and Rocha 2019). However, Kocak and Pawlowski (2021) revealed that these skills such as in terms of cloud or artificial intelligence and programming are for now not critical for leaders but assigned to the responsibility area of employees. This was also emphasized by some researchers, who addressed that digital transformation is more about people than the digital technology as already mentioned above (Bolden and O'Regan 2016; Abbu et al. 2022). As also confirmed by Kane (2019) what matters for leadership is the establishment of a transformative vision, the attitude to think ahead, and to be change-oriented. Since organizational adaptations are more difficult to solve than technological ones this is more essential than to obtain certain technological skills. This could also be the reason why only few capabilities concerning technology were found in the review. Nevertheless, business intelligence can help digital leader develop new business models (Klein 2020) and leveraging big data provided by IT helps to identify customer needs (Von Ohain 2019). Moreover, data security will become increasingly important in the future, making cybersecurity incident mitigation an important capability for digital leaders (Cortellazzo et al. 2019; Underwood 2019; Bach and Sulíková

2021; Klus and Müller 2021; Kocak and Pawlowski 2021). This includes monitoring the sensitive personal data processed, as unlawful data practices could harm the company's reputation and irreparably damage its brand image (Cortellazzo et al. 2019).

### **Digital tools:**

In examining the literature, I found that using a few digital tools is a prerequisite for successful digital leaders (Schwarz Müller et al. 2018; Larson and DeChurch 2020; Kocak and Pawlowski 2021). As regular teamwork is increasingly replaced by virtual teamwork, paper-based and face-to-face communication is more and more substituted by computer-based communication. The integration of communication software such as “Trello” or “Slack” ensures more structured communication, as archives or summaries cannot be guaranteed with face-to-face communication (Hesse 2018). On the other hand, communication tools are used to delegate routine tasks or exchange feedback. Therefore, digital leaders must be able to communicate through different communication means (Junior and Cabral 2020). Employee participation can be improved through collaboration software like “Asana” and as mentioned earlier, this is a critical capability for DL (Hesse 2018). As developing social interactions plays a key role in driving innovation, leaders need to know how to harness the power of networking (Cortellazzo et al. 2019). In that regard, a leader must be able to build collaborative networks (Sousa and Rocha 2019; Underwood 2019). Schwarz Müller et al. (2018, p. 130) summarizes this capability as "organizing a network," which means efficiently bringing together the best competencies to solve a particular task. Some authors, on the other hand, subsume this under the term "networking intelligence", which can be seen from both a technical and an organizational perspective (Klein 2020, p. 896). With collaboration tools, the transfer of knowledge can also be ensured, which can be crucial, if there is a frequent change of personnel (Abbu et al. 2022). Here, leaders must be aware that they play a critical role in shaping the team context and how teams use different types of technology (Larson and DeChurch 2020). Therefore, a digital leader must not only be able to create platforms for collaboration and knowledge sharing, but also act as a role model for open information sharing. In the context of the increasing spread of home office, digital platforms and cloud technologies are being used to ensure continuous access to information regardless of time and place (Sawy et al. 2016). A digital leader must have the capability to create and manage a digital workspace that meets the needs of their employees (McCarthy et al. 2021). In addition, the use of social media is important to understand customer needs or follow customer networks to take advantage of them (Sawy et al. 2016; Cortellazzo et al. 2019). Digital leaders must also be familiar with the use of decision-making tools that rely on big data analytics (Schwarz Müller et al. 2018; Sousa and Rocha 2019). This is also justified by the observation I made earlier in the text that digital leaders make decisions based on data rather than intuition. Furthermore, the extraction of valuable information from data analysis tools or various networks can be modelled as crucial part of DL (Klein 2020). Finally, the use of business intelligence applications can support in invention of new business models (Klein 2020).

## **4 Discussion**

The discussion section is divided into three subsections. First, I present the limitations of this work that must be considered when interpreting the results. Second, I present practical implications, before I finally propose future research opportunities.

### **Limitations:**

My literature review comes with some limitations. First, this review is based on a relatively small sample of studies restricted to selected number of databases. I applied the exclusion criteria to ensure quality and overall consistency of content. I focused only on high-quality scientific articles from peer-reviewed conference proceedings or journals and did not include non-commercial contexts or papers with certain industry or country in focus. Since no industry was focused, the literature also revealed only general capabilities relevant to the broad spectrum of organizations in the digital world. Furthermore, non-English publications have not been considered. Second, regarding search, I did not include synonymously terms like “skills” or “abilities”, which could have provided a broader range of research results. Third, regarding scope, I searched different comprehensive databases. However, there is a possibility, that other

studies such as those published in non-English language were not indexed in the database and therefore not included in this review. I also applied advanced search filters to narrow the hits in the various databases to title, abstract, and keywords, which limited the overall search results. Fourth, due to access restrictions, no additional manual search for recent publications in context-relevant journals from the field of general management and IS such as "Journal of Management", "Information & Organization", "Journal of MIS", "Journal of Business Economics" could be performed.

### **Practical implications:**

This review has important practical implication. These are relevant to leaders, which I categorize along four dimensions. First, this work helps to raise awareness of the capabilities required of leaders in digital enterprises. Second, it enables organizations to rethink strategies in terms of developing capabilities to respond to critical challenges arising from dynamic market structures. In this context, it could also help in restructuring the organizational culture required to compete in digital environments. Third, the findings may also support in recruitment and selection processes for leadership positions. They could also be used to develop suitable management roles in the organization from the capabilities. Finally, both professionals and organizations can use the results as an index for self-diagnosis and for development reasons.

### **Future research:**

Several research gaps were identified during the literature review. Along with the limitations of this work, I address following future research opportunities. As pointed out by Haythornthwaite, "there is no one approach to DL" (Bolden and O'Regan 2016). Even though the interview is from 2016, this statement still seems to be the rule, as also confirmed by my analysis, in which I found articles with different perspectives, definitions and scopes of the phenomenon. Accordingly, future research could help examine which capabilities, for example technological ones are relevant in different contexts (e.g. Bolden and O'Regan 2016; Larjovuori et al. 2018; Da Silva et al. 2019). It could be useful to distinguish according to various factors such as digital maturity level, industry or size. This would allow to take the general findings of this study to a more specific level, which would have a smaller number of addressees but a higher practical orientation. In this regard it would also be beneficial to gather practical insights through surveys with digital leaders of context-related organizations. Contributions could also be made from an individual perspective by assigning different capabilities to different roles such as first manager, HR management, senior management, and top management. A prioritization or weighting of the respective capabilities would bring advantages for the practice in assessing the relevance of each capability. In addition, I suggest that empirical research should be conducted to determine whether digital leaders share my view of the various DL capabilities. New empirical studies could be designed to develop measurable models to assess the long-term impact of DL on overall organizational performance (Abbu et al. 2020). Once the capabilities are empirically demonstrated, a model should be developed to measure the expression of the capabilities. Finally, developing strategies for training and acquisition of DL capabilities could mark a milestone in the research field of DL.

## **5 Conclusion**

What capabilities does a digital leader need to successfully master the challenges of digitization in contemporary organizations? In this paper, I addressed this research question by conducting a systematic literature review. Exceeding existing research on leadership capabilities, I also examined individual capabilities. I derived capabilities by examining the literature on DL with a qualitative analysis. Four overarching dimensions emerged from the analysis: Mindset, Behavior, Culture, Technology. Formulating and communicating a digital vision to the entire enterprise was found critical regarding the general mindset of digital leaders. Furthermore, the review revealed that digital leaders must bring certain capabilities concerning emotional intelligence. Entrepreneurial thinking and action and the involvement of collaborative networks in the innovation process have been associated with the behavior of digital leaders. In shaping a digital culture, digital leaders need to empower their subordinates and manage individual careers. Finally, digital literacy and the use of specific communication and collaboration tools were found to be critical for digital leaders in the context of technology literacy. With this literature review,

I contribute to the overall picture of the DL research field, adding value to both IS research and organizational research. The findings are relevant first for leaders, offering them a more integrative understanding of leadership capabilities in a digital world. By also considering individual capabilities, this work helps managers to assess their own leadership style. On the other hand, companies can make use of the results when hiring new managers. In addition, organizational alignment can be designed accordingly. Together with other works which examine traits or characteristics of digital leaders a holistic conceptual could be built up. However, it should be kept in mind that DL capabilities are context-dependent and the extent to which DL is required varies by digital maturity level or industry (e.g., manufacturing, education, service), and a variety of other factors. Future research could therefore help explore the distinct contextual capabilities according to the different criteria associated with digital leaders through empirical work.

## Appendix

<i>Publication outlet</i>		
Business & Management Studies: An International Journal	1	3,33%
Business Research	1	3,33%
Dialogue	1	3,33%
European Journal of Training and Development	1	3,33%
Frontiers in Psychology	1	3,33%
Hawaii International Conference on System Sciences	1	3,33%
IEEE International Conference on Engineering, Technology and Innovation	1	3,33%
International Academic Mindtrek Conference	1	3,33%
International Conference on Business Information Systems	1	3,33%
International Conference on Information Systems	1	3,33%
International Conference on Knowledge Management and Information Systems	1	3,33%
International Journal of Educational Administration, Management, and Leadership	1	3,33%
ISLA Proceedings	1	3,33%
Journal of Business Economics	1	3,33%
Journal of Business Research	4	13,33%
Journal of Decision Systems	1	3,33%
Journal of Management Inquiry	1	3,33%
Journal of Media Management and Entrepreneurship	1	3,33%
Managing Global Transitions	1	3,33%
MIS quarterly executive	1	3,33%
MIT Sloan Management Review	1	3,33%
Mrev management revue	1	3,33%
Research-Technology Management	3	10,00%
Strategic HR Review	1	3,33%
The Leadership Quarterly	1	3,33%
	30	100,00%
<i>Year</i>		
2016	3	10,00%
2018	3	10,00%
2019	7	23,33%
2020	7	23,33%
2021	7	23,33%
2022	3	10,00%
	30	100,00%

### *Appendix 1. Descriptive Data Analysis*

## References

- Abbu, H., Mugge, P., Gudergan, G., Hoeborn, G. and Kwiatkowski, A. (2022 A). “Measuring the Human Dimensions of Digital Leadership for Successful Digital Transformation”. *Research-Technology Management*, 65(3), pp. 39–49.
- Abbu, H., Mugge, P., Gudergan, G. and Kwiatkowski, A. (2020 B). Digital Leadership - Character and Competency Differentiates Digitally Mature Organizations. In: *2020 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*, pp. 1–9, Cardiff.
- Araujo, L.M. de, Priadana, S., Paramarta, V. and Sunarsi, D. (2021). Digital leadership in business organizations: an overview. *International Journal of Educational Administration, Management, and Leadership*, pp. 5–16.
- Avolio, B.J., Kahai, S. and Dodge, G.E. (2000). E-Leadership: implications for theory, research and practice. *The Leadership Quarterly*, 11(4), pp. 615–668.
- Bach, C. and Sulíková, R. (2021). Leadership in the Context of a New World: Digital Leadership and Industry 4.0. *Managing Global Transitions*, 19(3), pp. 209–226.
- Bawany, S. (2019). Leadership 4.0: How Ready Are You To Be A Digital Leader?. *Leadership Excellence*, 36(2), pp. 28–30.
- Bolden, R. and O’Regan, N. (2016). Digital Disruption and the Future of Leadership: An Interview With Rick Haythornthwaite, Chairman of Centrica and MasterCard. *Journal of Management Inquiry*, 25(4), pp. 438–446.
- Breuer, S. and Szillat, P. (2019). Leadership and Digitalization: Contemporary approaches towards leading in the modern day workplace. *Dialogue (1311-9206)*, (1), pp. 24–36.
- Cortellazzo, L., Bruni, E. and Zampieri, R. (2019). The Role of Leadership in a Digitalized World: A Review. *Frontiers in Psychology*, 10, p. 1938.
- Da Silva, F.P., Jerónimo, H.M. and Vieira, P.R. (2019). Leadership competencies revisited: A causal configuration analysis of success in the requirements phase of information systems projects. *Journal of Business Research*, 101, pp. 688–696.
- De Villiers, C., Kuruppu, S. and Dissanayake, D. (2021). A (new) role for business – Promoting the United Nations. Sustainable Development Goals through the internet-of-things and blockchain technology. *Journal of Business Research*, 131, pp. 598–609.
- Eberl, Julia.K. and Drews, P. (2021). Digital Leadership – Mountain or Molehill? A Literature Review. In: *Wirtschaftsinformatik 2021 Proceedings*, Essen.
- Ehmig-Klassen, K. and Schallmo, D. (2021). Digital Leadership: Approaches and Practical Insights from the B2B Sector. In: *ISPIM Connects Valencia*, Valencia.
- Erhan, T., Uzunbacak, H.H. and Aydin, E. (2022). From conventional to digital leadership: exploring digitalization of leadership and innovative work behavior. *Management Research Review*.
- Fernandes, C.I., Veiga, P.M., Ferreira, J.J., Rammal, H.G. and Pereira, V. (2022). Assessing strategic leadership in organizations: Using bibliometric data to develop a holistic model. *Journal of Business Research*, 141, pp. 646–655.
- Gierlich-Joas, M., Hess, T. and Neuburger, R. (2020). More self-organization, more control—or even both? Inverse transparency as a digital leadership concept. *Business Research*, 13(3), pp. 921–947.
- Gudergan, G., Mugge, P., Kwiatkowski, A., Abbu, H., Hoeborn, G. and Conrad, R. (2021). Digital Leadership - Which leadership dimensions contribute to digital transformation success?. In: *2021 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*, pp. 1–8, Cardiff.

- Gupta, S. (2018). *Driving digital strategy: a guide to reimagining your business*. Harvard Business Review Press. Boston.
- Hearsum, S. (2015). How to develop digital leadership capability. *Strategic HR Review*, 14(5).
- Hensellek, S. (2020). Digital Leadership: A Framework for Successful Leadership in the Digital Age. *Journal of Media Management and Entrepreneurship*, 2(1), pp. 55–69.
- Hesse, A. (2018). Digitalization and Leadership - How Experienced Leaders Interpret Daily Realities in a Digital World. In: *Proceedings of the 51st Hawaii International Conference on System Sciences*, Hawaii.
- Junior, J.C.F. and Cabral, P.M.F. (2020). Digital Transformation: The Gap Between Digital Leadership and Business Performance. In: *ISLA 2020 Proceedings*.
- Kane, G. (2019). The Technology Fallacy: People Are the Real Key to Digital Transformation. *Research-Technology Management*, 62(6), pp. 44–49.
- Kane, G.C., Palmer, D., Philipps, A.N., Kiron, D. and Buckley, A.N. (2016 A). Aligning the organization for its digital future. *MIT Sloan Management Review*.
- Kane, G.C., Phillips, A.N., Copulsky, J. and Garth, A. (2019 B). How Digital Leadership Is(n't) Different?, *MIT Sloan Management Review*, 60(3), pp. 34–39.
- Kitchenham, B., Pearl Brereton, O., Budgen, D., Turner, M., Bailey, J. and Linkman, S. (2009). Systematic literature reviews in software engineering – A systematic literature review. *Information and Software Technology*, 51(1), pp. 7–15.
- Klein, M. (2020) Leadership Characteristics in the Era of Digital Transformation. *Business & Management Studies: An International Journal*, 8(1), pp. 883–902.
- Klus, M.F. and Müller, J. (2020). Identifying Leadership Skills Required in the Digital Age. *CESifo Working Paper*, (8180), pp. 1–35.
- Klus, M.F. and Müller, J. (2021). The digital leader: what one needs to master today's organisational challenges. *Journal of Business Economics*, 91(8), pp. 1189–1223.
- Kocak, S. and Pawlowski, J. (2021). A Qualitative Study on the Categorisation and Prioritisation of Digital Competencies and Attitudes for Managers and Employees. In: *Proceedings of the 13th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management*. Science and Technology Publications, pp. 52–63, Valletta.
- Kohnke, O. (2017). It's not just about technology: The people side of digitization. , Oswald, G. and Kleinemeier, M. (eds) *Shaping thr Digital Enterprise*. Springer, pp. 69–91, Waldorf.
- Larjovuori, R.-L., Bordi, L. and Heikkilä-Tammi, K. (2018). Leadership in the digital business transformation. In: *Proceedings of the 22nd International Academic Mindtrek Conference*, pp. 212–221. Tampere.
- Larson, L. and DeChurch, L.A. (2020). Leading teams in the digital age: Four perspectives on technology and what they mean for leading teams. *The Leadership Quarterly*, 31(1), p. 101377.
- McCarthy, P., Sammon, D. and Alhassan, I. (2021). Digital Transformation Leadership Characteristics: A Literature Analysis. *Journal of Decision Systems*, pp. 1–31.
- Meffert, J. and Swaminathan, A. (2018). Leadership and the Urgency for Digital Transformation. *Leader to Leader*, 2018(88), pp. 44–49.
- Mihai, R.-L. and Crețu, A. (2019). Leadership in the Digital Era. *Valahian Journal of Economic Studies*, 10(1), pp. 65–72.

- Mugge, P., Abbu, H., Michaelis, T.L., Kwiatkowski, A. and Gudergan, G. (2020). Patterns of Digitization: A Practical Guide to Digital Transformation. *Research-Technology Management*, 63(2), pp. 27–35.
- Ngayo Fotso, G.M. (2021). Leadership competencies for the 21st century: a review from the Western world literature. *European Journal of Training and Development*, 45(6/7), pp. 566–587.
- Promsi, C. (2019). The Developing Model of Digital Leadership for a Successful Digital Transformation. *GPH - International Journal of Business Management (IJBM)*, 2(8).
- Sawy, O.El., Amsinck, H., Kræmmergaard, P. and Lerbech Vinther, A. (2016). How LEGO built the foundations and enterprise capabilities for digital leadership. *MIS Quarterly Executive*, 15(2).
- Schiuma, G., Schettini, E., Santarsiero, F. and Carlucci, D. (2021). The transformative leadership compass: six competencies for digital transformation entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*.
- Schwarz Müller, T., Brosi, P., Duman, D. and Welpel, I.M. (2018). How Does the Digital Transformation Affect Organizations? Key Themes of Change in Work Design and Leadership. *management revue*, 29(2), pp. 114–138.
- Sousa, M.J. and Rocha, Á. (2019). Skills for disruptive digital business. *Journal of Business Research*, 94, pp. 257–263.
- Underwood, C. (2019). Developing leadership roles for a digital age. *Strategic HR Review*, 18(5), pp. 233–234.
- Von Ohain, B.P. (2019). Leader Attributes for Successful Digital Transformation. In: *ICIS 2019 Proceedings*, Munich.
- Weber, E., Büttgen, M. and Bartsch, S. (2022). How to take employees on the digital transformation journey: An experimental study on complementary leadership behaviors in managing organizational change. *Journal of Business Research*, 143, pp. 225–238.
- Webster, J. and Watson, R.T. (2002). Analyzing the Past to Prepare for the Future: Writing a Literature Review. *MIS Quarterly*, 26(2), pp. xiii–xxiii.
- Wolfswinkel, J.F., Furtmueller, Elfi. and Wilderom, C.P.M. (2013). Using grounded theory as a method for rigorously reviewing literature. *European Journal of Information Systems*, 22(1), pp. 45–55