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Digital leadership routines: Understanding the role of artifacts in digital leadership development

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ABSTRACT

Digitalization requires organizations to quickly adapt to technological trends for sustaining and improving their market position. To ensure they are capable of responding quickly to such trends, organizations implement a new leadership approach, which research and practice refer to as Digital Leadership (DL). The previous literature considers organizations from the information technology (IT) industry as frontrunners in developing DL. While it has focused on the skills of the digital leader and defining DL, our study addresses the so far unexplored development of DL at routine level. We conducted 24 interviews with followers and leaders in the IT industry. Analyzing the transcripts of those interviews with the theoretical lens of organizational routines, we contribute to DL research. We shift the narrative in this field from defining what DL is to understanding how DL is developed by the actions of leaders and followers through artifact-based transformation of DL routines. We identify artifacts in six roles that stabilize or flexibilize performance of DL routines. We uncover that DL is not static but dynamic as flexibilizing artifacts promote adjustment in routine performance based on situational context. Leaders and followers can impede DL development by deciding to situationally deviate from the intended role of artifacts due to tensions between artifacts and past experiences. These findings advance DL theory by uncovering the importance of followers in DL and leadership theory by adding the lens of routines to leadership development. They help practitioners to understand the complexity of DL development and how the IT industry realizes DL.

1. Introduction

Organizations in different industries seek to develop Digital Leadership (DL) as a leadership approach toward delivering "digital outcomes that include strategic benefits, organizational transformation and value creation" (Adie, Tate, Cho, & Valentine, 2022). Business and market imperatives to develop DL are manifold. Non-information technology companies aim to learn from DL in information technology (IT) companies since they form the industry with the largest market capitalization worldwide and dominate the top 10 most valuable companies (PricewaterhouseCoopers, 2024). Accordingly, non-IT companies strategize to follow examples of the IT industry to complement their products with digital services to sustain their relevancy and market success. One key aspect of this strategy is developing DL. Indeed, companies from various industries (e.g., automotive) visit IT companies to learn about their DL

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development (Meffert & Swaminathan, 2018). Since they consider IT companies as role models of DL, they afterward adopt workplace designs or policies that they consider characterizing DL.

Scholars have thus far investigated what DL is. They have characterized DL by providing definitions (Adie et al., 2022; El Sawy, Kræmmergaard, Amsinck, & Lerbeck Vinther, 2016), identifying digital leaders' skills (Kusanke, Kendziorra, Pilgenröder, & Winkler, 2023; Ongena, Morsch, & Ravesteijn, 2024; Petrucci & Rivera, 2018), or breaking down DL into its constituents (e.g., vision, governance, career development) (Adie et al., 2022). In contrast, little work exists on how organizations can develop DL. There may be several reasons for that research gap. First, DL is a young research stream in leadership literature. Consequently, scholars have focused their initial efforts on defining characteristics that mark its differences from previous leadership understandings (Adie et al., 2022; Eberl & Drews, 2021). Second, leadership development research generally focuses on developing leaders and their leadership skills (Cunha e Pina, Rego, Clegg, & Neves, 2013) rather than developing the organizational capabilities necessary to execute tasks (Day & Thornton, 2018). In that spirit, Avolio, Walumbwa, and Weber (2009) asserts that leadership manifests in interactions among leaders and followers. However, DL scholars increasingly recognize the importance of theorizing DL development to understand how organizations can develop DL through actions and interactions among their individuals (Adie et al., 2022). Hence, to develop DL, companies must develop these interactions so that they repeatedly reflect the characteristics of DL. This suggests an organizational routines perspective when studying DL development (D'Adderio, 2008; Feldman & Pentland, 2003; Feldman, Pentland, Pentland, D'Adderio, & Lazaric, 2016).

We can understand leadership interactions as emerging practices that establish a relationship among leaders and followers. These leadership interactions occur as repeated, task-oriented sequences of actions, which lends to an organizational routines perspective (Feldman, 2021; Feldman & Orlikowski, 2011). Accordingly, we define leadership routines as repeated, task-oriented sequences of actions and interactions among leaders and followers. By extension, DL routines emerge from actions and interactions that reflect DL characteristics. DL is characterized by an agile, customer-centric, failure tolerant, visionary and innovative organization in which leaders coach and support followers to self-organize, leverage their empowerments, take decisions and continuously learn, develop and collaborate cross-functionally (El Sawy et al., 2016; Gierlich-Joas, Hess, & Neuburger, 2020; Oberer & Erkollar, 2018). But how can the theory of routine dynamics inform our investigation of developing these DL characteristics in organizations? Previous studies on routine dynamics placed artifacts at the center of routines (D'Adderio, 2011) and showed that organizations intentionally design, remove, or replace such artifacts to trigger routine dynamics of stability or flexibility in routines' performance (Feldman, 2021; Glaser, 2017; Zimmer, Baiyere, & Salmela, 2023). In other words, organizations use artifacts to develop organizational routines. When transferring this observation to DL development, we find that IT companies, in particular, publish testimonials that present DL artifacts such as the vacation policy of Netflix or vision statements (Manimala & Wasdani, 2013; McCord, 2014). However, despite the recognition of artifacts' role in routines, and despite previous research investigating DL artifacts in IT companies (Heinz, Hunke, & Breitschopf, 2021; Manimala & Wasdani, 2013; Mankins & Garton, 2017; McCord, 2014; Prakash, Bisla, & Rastogi, 2021), we still know little about the role of artifacts in developing DL routines. In particular, we know little about how leaders' and/or followers' use of artifacts develops DL. After all, artifacts' role in routines is not directly grounded in their characteristics but emerges from the relations between individuals and artifacts when performing routines (Nicolini, 2012). Therefore, we apply routines theory to investigate the development of DL in IT companies, to advance our understanding of a) DL development as developing repeated, task-oriented sequences of actions and interactions among leaders and followers in organizations, and b) artifacts' roles in developing DL routines. Successful development of DL is characterized by the repetitive application of DL in an organization, which does not happen coincidentally but is based on intentionally transformed and established routines. To identify the roles of artifacts, we unpack how leaders and followers use these artifacts when performing DL routines (Nicolini, 2012). Hence, we raise the following research question: *How do artifacts influence the development of digital leadership routines?*

To answer this question, we conducted 24 interviews with followers and leaders in IT companies. We opted to study these companies for two reasons. First, practitioners in non-tech companies identify IT companies as frontrunners and, for instance, visit them to uncover "the secrets of Apple, Facebook, Google and Amazon" (Meffert & Swaminathan, 2018, p. 45). Second, the previous literature shows increased scholarly interest in the leadership approaches and artifacts of IT companies (Heinz et al., 2021; Manimala & Wasdani, 2013; Mankins & Garton, 2017; McCord, 2014; Prakash et al., 2021). We analyzed the transcripts of our interviews using the grounded theory method and found that interviewees referred to artifacts when explaining their actions as leaders or followers performing DL routines. By introducing the theory of organizational routines to our analysis, we make three contributions to the DL literature: First, we shift existing DL research's focus from defining what DL is to exploring its development. We uncover that DL constituents are not static but are adjusted based on the situational context in which the DL routine is performed. Second, we identify six roles that artifacts can take in developing DL routines: envisioning, empowering, facilitating, supporting, enforcing, and clarifying. While envisioning, empowering, facilitating, and supporting trigger routine dynamics of flexibilizing in order to enhance creativity and innovation, enforcing and clarifying instead stabilize routine dynamics to minimize deviations in performance. Furthermore, we uncover tensions that drive followers and leaders to deviate from the intended role of artifacts. Third, we expand the understanding of DL development by showing that this not only hinges on the skills of the leader but also concerns the interactions among leaders and followers and how these interactions draw on artifacts. Our findings advance knowledge about DL and contribute to the field of leadership development. For practitioners, we present four implications of our results guiding the development of DL in organizations.

2. Theoretical foundation

2.1. Digital leadership

Digitalization refers to the socio-technical phenomena that emerge test organizations adopt digital technologies (Legner et al., 2017). One of these phenomena is the advancement of leadership to tackle the challenges and opportunities that adapting new and emergent digital technologies present for value creation (Adie et al., 2022). Practitioners, Information Systems (IS), and leadership scholars refer to this leadership advancement as DL. DL has received increasing attention from scholars focusing on its positive impact, such as organizational digitalization (Yao, Tang, Liu, & Boadu, 2023), innovative work behavior in digital workplaces (Erhan, Uzunbacak, & Aydin, 2022), psychological well-being (Zeike, Bradbury, Lindert, & Pfaff, 2019), and organizations' customer orientation (Mihardjo, Sasmoko, Alamsjah, & Elidjen, 2019). In this vein, Baptista, Stein, Klein, Watson-Manheim, and Lee (2020) emphasize the role of leadership in realizing the benefits of introducing digital technologies to organizations' workplaces. However, organizations must first develop DL in order to realize its positive impacts. DL development can be challenging because while studies frequently investigate what DL is, we lack knowledge about how organizations can develop it. In the following, we address those two research streams: (1) definitions of DL and its constituents, and (2) DL development.

2.1.1. Definition of digital leadership and its constituents

Scholarly definitions of DL are heterogeneous. While Ravesteijn and Ongena (2019) refer to DL as a synonym for e-leadership, a term that describes leadership mediated by IT (Liu et al., 2018), El Sawy et al. (2016) point out that DL is more than using digital technology to lead. They define DL as "doing the right things for the strategic success of digitalization" (p. 141). In this paper, we follow the definition of Adie et al. (2022), who define DL as "delivering digital outcomes that include strategic benefits, organization transformation and value creation" (p. 5). We choose this definition since it outlines the goal of DL, that is, the creation of value by achieving digital outcomes, and the necessity of organizational transformation to that end. The transformation of an organization's leadership approach manifests in changing the characteristics of existing constituents of leadership. These changes cannot be limited to changing characteristics of constituents at the organizational level toward DL but must extend to the interactions of individuals (this includes leaders and followers in an organization) and groups in the organization, which we refer to as the individual level (Braojos, Weritz, & Matute, 2024; Eberl & Drews, 2021).

At the organizational level, the characteristics of DL are represented in the company vision, culture, organizational structure, and governance. DL requires an inspiring and holistic company vision at the center of the organization's activities, one which provides long-term guidance (Hearsum, 2015; Meffert & Swaminathan, 2018). Aligned with the company's vision, DL fosters a culture of innovation and open-mindedness (Petrucci & Rivera, 2018; Promsri, 2019). It is suggested that innovation is also driven by DL's promotion of an agile network structure with limited hierarchy (Oberer & Erkollar, 2018; Schwarzmüller, Brosi, Duman, & Welpe, 2018), where governance empowers followers to make decisions within given regulations (Valentine & Stewart, 2015; Westerman, Bonnet, & McAfee, 2014). Meanwhile, Zhu, Zhang, Xie, and Cao (2022) analyzed the importance of DL at the organizational level and found that the person–organization fit positively affects DL.

At the individual level, research describes the constituents of people management, people development, collaboration, and communication as manifesting DL characteristics (Eberl & Drews, 2021). In people management, interactions occur between leaders and followers. These interactions are characterized by leaders coaching followers in operational decision-making (Benitez, Arenas, Castillo, & Esteves, 2022) and supporting followers in leveraging their empowerment and self-organization (Gierlich-Joas et al., 2020). Even though these interactions foster the empowerment of followers, previous literature has rarely investigated the followers' perspective in these interactions (Borowska, 2019). Further, scholars have found that continuous learning and cross-discipline people development play a significant part in DL (Mihardjo et al., 2019), increasing individuals' organizational commitment (Braojos et al., 2024). DL follows a "hire for a career not a job" (El Sawy et al., 2016, p. 164) principle and a life-long learning objective, where followers grow in their job and develop in horizontal and vertical careers. The individual level also involves collaboration in virtual, distributed, and heterogeneous teams (Oberer & Erkollar, 2018). In this vein, DL encourages individuals to openly share information and knowledge. In addition, communication across functions and with external stakeholders is facilitated by an open communication style (Borowska, 2019).

DL research commonly investigates the skills, styles, and roles of the digital leader in the company. This research describes the digital leader as visionary, digitally savvy, collaborative, adaptable, creative, and motivating, as well as engaged in business planning and innovating (Adie, Tate, Valentine, & Cho, 2024; Bennis, 2013; Kane, Phillips, Copulsky, & Andrus, 2019; Klein, 2020; Klus & Müller, 2018; Ongena et al., 2024; Tigre, Henriques, & Curado, 2024). The digital leader can lead the digital transformation (Adie et al., 2022). In particular, platform digitization capabilities in DL produce a high performance in innovation (Benitez et al., 2022). Borowska (2019) notes that digital leaders do not depend on disciplinary leadership authorization; instead, both leaders and followers accept entrepreneurial responsibilities and make decisions for the company. However, we have a limited understanding of DL styles, as one leader's approach can leverage one or more of those styles (e.g., transformational, transactional). While transformational leadership motivates followers to achieve outstanding goals, transactional leadership monitors how followers complete defined tasks (Antonakis, Avolio, & Sivasubramaniam, 2003). DL research is predominantly focused on transformational leadership (April & Dalwai, 2019; Prince, 2018). However, scholars have started to discuss DL as comprising transformational, transactional, authentic, relationship-oriented, and task-oriented leadership. However, the interplay of those leadership styles has not yet been subject to research (Antonopoulou, Halkiopoulos, Barlou, & Beligiannis, 2021; Farhan, Chaudhry, Razmak, & El Refae, 2023).

2.1.2. Artifacts in digital leadership development

There are few studies on DL development. Scholars in general leadership development mainly focus on instruments for training the leader, in so-called leader development, such as assessments and mentoring, and they scarcely investigate changes in everyday interactions among leaders and followers (Day, 2001). Eberl and Drews (2022) posit that DL development must overcome tensions that impede its progress. For example, Zimmer et al. (2023) show that DL development involves removing or replacing conflicting artifacts, though they provide little details on other roles that artifacts can assume in DL development. The previous literature asserts that leadership development requires an ongoing process of adapting to changed contexts (Mostovicz, Kakabadse, & Kakabadse, 2009). Hence, DL development not only occurs when moving from one leadership approach to another, but also leadership approaches themselves continuously change based on organizational contexts. As such, the existing DL research focus on describing single DL constituents fails to capture and explain DL as dynamic. Adopting this new perspective on DL development is important as it reflects a transformation from past leadership approaches to DL and embodies DL's continuous evolution.

Researchers and practitioners interested in DL development have turned to IT companies. The rapid development of technology and knowledge requires that IT companies develop new, cutting-edge innovations. This hinges on the emergence of DL within IT companies to manage uncertainty about future developments, foster innovation, and continuously adjust the digital business models (Prakash et al., 2021). Accordingly, practitioners seek to understand DL development, for example, by traveling to Silicon Valley, Tel Aviv, and further headquarter locations of IT companies, to identify the keys to successful DL development (Meffert & Swaminathan, 2018). This research has reported uncommon artifacts such as Netflix's vacation policy, which allows employees to take as much time off as they feel is appropriate (McCord, 2014). Similarly, Heinz et al. (2021) investigate vision statements from Apple and Netflix, which set out how these organizations will lead with resilience in changing environments, and Spotify has interestingly been reported to have released guidelines supporting its self-organized functional teams in balancing innovative and operational tasks as part of their routines (Mankins & Garton, 2017). Moreover, scholars refer to artifacts such as Google's leadership principle when striving to explain DL (Manimala & Wasdani, 2013; McCord, 2014), or, as part of an authentic leadership approach, how leaders such as Satya Nadella at Microsoft share artifacts that promote psychological safety, such as personal stories about failures (Prakash et al., 2021). The existing research has studied these artifacts and their contents as part of efforts to characterize the constituents of DL in IT companies. However, it does not yet explain artifacts' role as a central non-human actor in followers' and leaders' performance of DL routines (Da Costa Junior, Da Silva Nascimento, Da Silva, & de Barros Jeronimo, 2024). Hence, we investigate the role of purposefully positioned and implemented artifacts in developing DL routines.

2.2. Role of artifacts in routines

The objective of this paper is to develop an understanding of artifacts' role in DL development. Organizations unfold every day through routines, including leadership routines (Becker, Lazaric, Nelson, & Winter, 2005; Spillane, 2005). Feldman and Pentland (2003) define routines as "repetitive, recognizable patterns of interdependent actions, carried out by multiple actors" (p. 95). How actors carry out—or perform—routines depends on their actions and also the artifacts that they use. Indeed, artifacts play a central role in routines as non-human actors (Da Costa Junior et al., 2024). Artifacts come in various forms, such as written rules, procedures, forms, and the physical environment, such as an office or factory (Pentland & Feldman, 2008). Artifacts can replicate specific patterns of actions in specific situations, which enact the performative aspect (PA) of routines (Feldman & Pentland, 2003). Scholars have also studied cognitive or representational artifacts, such as Standard Operating Procedures (SOPs) and formal rules, as representations of routines (Pentland & Feldman, 2008). Artifacts often present proxies for the ostensive aspect (OA) of routines, that is, the "abstract or generalized pattern of the routine" (Pentland & Feldman, 2005, p. 796) that guides its performance. OAs are not only artifacts of formal representation but can also take the form of cognitive ideas about the ought-to-be of routines. Hence, artifacts can represent parts of the OA in the PA; however, the PA always involves some level of adaptation by the human actor (D'Adderio, 2011).

Routines are not monolithic, but exert dynamics of stability and change (Howard-Grenville & Rerup, 2017). Some routines emerge, but most are intentionally designed by organizations (D'Adderio, 2011; Glaser, 2017). Through the example of changes to the patrol routines of a law enforcement agency, Glaser (2017) shows the purposeful influence of artifacts' materiality on the flexibility in routine performance, in this case, permitting variations and change (Albuquerque & de Albuquerque & Christ, 2015). Artifacts may also inscribe the broader organizational context (D'Adderio, 2011), and in this way, generate expectations that guide, invite, or constrain actors' performance of routines (Pentland & Feldman, 2008). As such, artifacts can stabilize or flexibilize individual's performance of routines. The artifact assumes a pre-defined role based on how its creator understands the routine's scheme (Da Costa Junior et al., 2024; Feldman & Pentland, 2003). However, human actors other than the creator are oblivious to this pre-defined role, and thus the role they ascribe to the artifact stems from their perception or observation of its application (i.e., perceived role). Thus, during routine

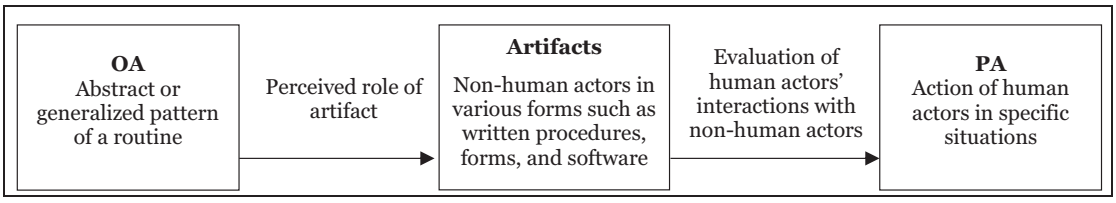

Fig. 1. Emergence of organizational routines.

performance, human actors interact with non-human actors (i.e., artifacts) in their perceived role. The resulting patterns of action emerge as the human actors' actions (Leonardi, 2011; Nicolini, 2012). From this perspective, human actors' behavior is not fixed or pinned to artifacts but depends on the context and those artifacts; in this setting, humans can decide whether to involve or follow an artifact (Horan & Finch, 2013; Pentland, Hærem, & Hillison, 2011). Thus, human actors' perceived roles of artifacts, their past experiences, and private intentions combine to form the agency of artifacts as non-human actors in routines (Becker et al., 2005; Dionysiou & Tsoukas, 2013). Hence, the modification, removal, or creation of artifacts can trigger changes in routines' PA (Zimmer et al., 2023). Figure 1 shows the emergence of organizational routines based on the role of artifacts as linkage between the OA and the PA.

The previous literature sets out that artifacts do not determine routine performance, but it ascribes them an important role in routines (D'Adderio, 2008). Chiefly, scholars have found that artifacts can constrain or guide routine performance (Baralou & Dionysiou, 2022), to stabilize routines. In particular, software artifacts stabilize routine performance through their offered (and missing) features (Ribes, Jackson, Geiger, Burton, & Finholt, 2013). This suggests that software artifacts determine routines, but Leonardi (2011) showed that human actors ascribe perceived roles to artifacts when deciding whether to use software or leverage workarounds for a specific routine performance. This means that the role of an artifact can change based on the human actor or situational context (Nicolini, 2012). Lastly, Ribes et al. (2013) point out that artifacts, rather than having a passive role, actively reconfigure and coordinate human actions in routine performance. This echoes research into digital workplace transformation, which investigated new digital workplace technology (e.g., smartphones, Enterprise Resource Planning (ERP) systems, etc.) as artifacts that trigger changes in workplace routines (Dery, Kolb, & MacCormick, 2014; Ribes et al., 2013; Rossi, Nandhakumar, & Mattila, 2020). Thus, the existing work describes that artifacts, to differing degrees, inform and shape human action in routines (Glaser, 2017). This means "prescribing, enabling and constraining … they [artifacts] are markers for the collective assignment … acquir[ing] … a certain 'for-ness', purpose" (Iannacci & Hatzaras, 2012, p. 5) through their use by human actors in routine performance. However, the role or "for-ness" that individuals (leaders and flowers) ascribe to artifacts in DL routines—and thus the role of artifacts in DL development—remains unknown.

Accordingly, we chose the theoretical lens of routines when exploring the role of artifacts in developing DL routines since we understand DL as emerging from repeated, task-oriented sequences of action and interaction among leaders and followers in organizations. We build on the understanding that routine performance (PA) is an interplay of the artifact as non-human actor and the human actor, where the human actor decides how to act based on the perceived role of the artifact. Therefore, we focus on studying the role of artifacts in DL development through routines from the perspective of followers and leaders (Da Costa Junior et al., 2024; Leonardi, 2011).

3. Research approach

To study the role of artifacts in DL development, we conducted semi-structured expert interviews with leaders and followers in IT companies. Considering the lack of research on artifacts' role in DL development, we built our data analysis on Corbin and Strauss's (1990) exploratory, qualitative grounded theory. When analyzing our data, we employed the theory of organizational routines, making DL routines our unit of analysis.

3.1. Data collection

We collected data through semi-structured expert interviews. In total, we conducted 24 interviews between September and November 2021 via Microsoft Teams using audio and video connections. We categorized interviewees as leaders ($n = 13$) when they disciplinarily lead followers, and all others as followers ($n = 11$). The interviews' average duration was 43 min. The first author textually documented all interviews either via recording and subsequent transcription ($n = 22$) or written minutes ($n = 2$). We acquired interviewees from our professional network ($n = 14$) as well as LinkedIn ($n = 10$). We selected them based on recommendations from our professional network or prior interviewees (i.e., snowballing) and because of their experience in IT companies. Furthermore, we aimed for diversity of age, gender, ethnicity, and education. The resulting sample comprised experts with extensive experience from different management positions in IT companies and who were part of DL development as either leaders, followers, or both. Their average experience in IT companies was more than 19 years. Thus, all interviewees had track records of working in IT companies that developed DL. We refer to firms as IT companies when their main revenue comes from providing value to customers through digital technology, including software, hardware, and IT consulting services. The companies the interviewees were working for at the time of the interview have an average size of 88,000 employees ranging from the smallest company with 3600 employees to the largest with 228,000 employees. The average revenue is 75 billion (lowest revenue: 0,3 billion, highest revenue: 282 billion). The companies (C1 to C13) operate in multiple fields: cybersecurity (C1, C11), IT consulting (C1, C2, C3, C6, C7, C9, C10, C11, C12, C13, C14), hardware (C3, C9), software (C3, C4, C5, C6, C7, C8, C9, C14), Cloud Service Provider (C2, C3, C4, C5, C8, C9, C13). The evidence for DL development in these companies is a track record of financial and strategic benefits generated from digital outcomes (Adie et al., 2022) and publications about their organizational and leadership transformation.

When interviewing leaders and followers, we prepared two interview guides—one for leaders, one for followers (see the Appendix)—which we did not provide to interviewees before their interviews. These guides contained questions based on the constituents of DL, such as people management (Borowska, 2019) and decision-making (Benitez et al., 2022), as mentioned in the theoretical foundation of this paper. We structured the interviews as follows. First, we asked interviewees to introduce themselves, including their position and experience. Second, we asked them to describe how the constituents of DL are pursued in their day-to-day business. Third, we asked if there were any formal rules that initially guided their actions and behaviors. Lastly, closing the interviews,

Table 1
Interview candidates divided into leaders and followers.

Leaders					Followers			
No.	Department	C	YiIT	YaL	No.	Department	C	YiIT
L1	Engineering	C1	25	9	F1	Sales	C9	12
L2	Customer Success	C2	13	11	F2	Strategy	C10	11
L3	Transformation	C3	32	23	F3	Industry Experts	C3	12
L4	Sales	C4	25	11	F4	Sales	C9	11
L5	Partner Management	C2	30	25	F5	Partner Management	C2	18
L6	Consulting	C2	25	2	F6	Solution Technology	C3	33
L7	HR	C10	23	15	F7	Engineering	C11	22
L8	Consulting	C5	26	18	F8	Engineering	C12	26
L9	HR	C6	8	1	F9	Sales	C13	8
L10	Transformation	C7	20	10	F10	Strategy	C11	15
L11	Sales	C8	26	19	F11	Engineering	C7	4
L12	Industry Experts	C2	24	21				
L13	Customer Success	C3	30	1				

we asked interviewees about additional aspects related to DL. When interviewing, we followed Myers and Newman's (2007) seven guidelines to mitigate the common risks of qualitative interview studies. For example, we used mirroring to avoid influencing the experts' responses. We leveraged our semi-structured interview approach to delve into interesting responses and explore different directions during data collection. That is, we simultaneously collected and analyzed data.

After conducting and analyzing four interviews — two with leaders and two with followers — we noticed that their responses described several DL routines, and thus, we adopted the theoretical lens of organizational routines. Moreover, we noticed from these interviews that artifacts' perceived role depended on companies' past leadership approach. Thus, we adjusted the interview guides to collect more information on past leadership approaches and their influence on DL development in routines' PA. We also aimed to acquire insights into how artifacts are designed and mobilized in DL development. For this, we selected additional interviewees in Human Resources (HR) and transformation management. This sampling process entailed a versatile set of interviews, and after reaching theoretical saturation (Corbin & Strauss, 2014), we concluded data collection. Table 1 lists the leaders (L1 to L13) and followers (F1 to F11), including the interviewees' departments, companies (C), years of experience in the IT industry (YiIT), and years of experience as a leader (YaL).

To manage the risk of Maxwell's (2013) four validity threats, we took the following actions: First, when scheduling interviews, we ensured that interviewees were in a neutral environment where they could speak openly. Moreover, we asked open questions and provided interviewees time to speak. In addition, we asked follow-up questions, leveraging the wording of the interviewees to uncover more details (i.e., mirroring, Myers & Newman, 2007). Second, to reduce bias and collect "rich" data, we triangulated the collected data with publicly available data found through internet searches (e.g., companies' websites), as IT companies widely share insights about DL and respective artifacts. Finally, data collection and analysis as well as resulting interpretations were discussed among all authors.

3.2. Data analysis

We used the grounded theory method (Corbin & Strauss, 1990) to inductively develop a coherent theory on artifacts' role in DL development. We took the following steps in preparing and conducting our data analysis: (1) the first author transcribed the recorded data using the software MAXQDA, including grammatical and linguistic corrections; (2) the first author triangulated the interview data with publicly available data about artifacts in IT companies; (3) we conducted open, axial, and selective coding, as described in Table 2; and (4) we continuously reflected upon our final theorizing. Although we infused our interview questions with our theoretical foundation of DL and routines, we inductively coded how artifacts influence the PA of DL routines. We formulated our codes in English and translated non-English quotes into English.

We continuously analyzed our data parallel to data collection. In that process, we started by creating a codebook while openly coding four transcripts (L1, L2, F1, F2). We transcribed and analyzed every line and assigned one or multiple codes per line. These codes channeled and expressed similarities among the lines' content. We kept memos documenting the thoughts and understandings behind our coding. For example, we coded quotes such as: "One sticking point in our journey to DL was a written, easy vision statement that created clarity about where we want to go as a company and how individuals can individually contribute to it" (L2). Our attention was caught by how writing down the abstract vision in an understandable artifact was important to enable individuals to align their

Table 2
Coding categories and exemplary quotes.

Exemplary Data	Open Coding	Axial Coding	Selective Coding
"The grounding principle of the organization is to have a growth mindset." (L5) "We have an internal principle that says you should criticize constructively." (F9)	Principles for leading and hiring	Generalized patterns of DL routines in the OA	Development of DL on routine level by artifacts in six roles transferring OA to PA: envisioning, facilitating, empowering, supporting, clarifying, enforcing
"We want to create a real failure culture because it is the foundation of agility." (L8) "Decision authority is distributed across the organization to make sure people with the right skills take decisions." (M10)	Designs of the organization		
"Just being visionary, … having a sense of optimism that … inspires, … coach[ing], and be[ing] open to other individuals' [way of] looking at things." (L2) "A leader needs patience, … be a good listener, … empathy, … and enjoying working with people that are smarter than you." (M5)	Attributes for leaders		
"Sometimes there are principles that are still valid but need to be rephrased and written down to address individuals." (L3) "The vision gives people a north star and they can develop ideas how to get there by themselves." (L1)	Envisioning		
"A post on social media can reach an audience [that is] not limited by hierarchical boundaries." (L10) "I am surprised about the transparency of this company. If you want to find out what a specific team is doing, you can go to their digital workspace and get the information! (F8)	Facilitating		
"People empowerment is only limited by necessary policies to be compliant" (L11) "Decision authority is not with single individuals, but distributed to the individuals that have the knowledge, background and are affected by the decision." (M7)	Empowering		
"In preparation for the job as a leader, I did a coaching training that was very intense." (L9) "Leaders coach followers, so there is no directive order, however, followers also reverse coach leaders and question them." (M9)	Supporting		
"On the leaders' skills, it is written down what we expect from a leader, from Munich to Tokyo." (L7) "We have cards in meetings rooms that make our values clear and that we can refer to in difficult situations." (M6)	Clarifying		
"The picture of a leader is very diverse and different people can grow into the manager role. However, there are some behaviors that are no gos." (L8) "We have a very high bar of what is expected from leaders and that comes down then through the teams." (L9)	Enforcing		
"Individuals are used to working as lonely wolves [and] not sharing information." (F3) "In the past, it was a privilege to have access to specific information." (L12)	Artifact and past behavior	Intentional application of artifacts in the PA	
"Individuals are empowered to take decisions within boundaries due to compliance and policies." (L3) "Individuals take the opportunity for self-fulfillment by defining their own contribution to the vision." (F2)	Behavior based on artifacts' roles		
"I do not act according to the company values, but [act according to] my personal values." (L12) "Individuals like decision authority but withdraw from the responsibility." (M4)	Intents in applying artifacts		

actions. We turned to the literature to identify suitable theories for examining and explaining how artifacts influence behavior in recurring interactions. This led us to the theoretical lens of organizational routines, which provides concepts for explaining the relations between generalized patterns, designed artifacts, and the actions resulting from these artifacts. This initial open coding of four interviews resulted in nine codes based on 247 coded segments and more than 70 memos. Later, we used this codebook when extending our open coding to additional interviews. This involved adding and adjusting codes that emerged from subsequent interviews.

When starting axial coding, we introduced the theory of organizational routines. Specifically, we examined our open codes against the concepts of artifacts, OA, and PA. This led to 56 artifacts, 83 OAs, and 108 PAs. Next, we reviewed our axial codes when entering selective coding. We asked ourselves what roles the identified artifacts take in DL development when related to the identified OAs and PAs. We noticed that OAs were not just inscribed into artifacts, but that interviewees described specific roles that the artifacts have for implementing OAs. For example, L1 expressed the artifact of a vision statement as "a buoy in the water," intentionally designed to fulfill the role of "providing orientation" in DL development. In addition, the interviewees described how the perceived role of the artifact is interpreted by individuals when performing DL routines (i.e., PA).

In total, we identified six roles that artifacts take in developing DL development. These roles are grounded in individuals' interpretation (i.e., leaders and followers) of artifacts in 13 DL routines' PAs. When selectively coding, we named these routines by their intended outcome, for example, hiring decision-making (Feldman et al., 2016). We provide an overview of our coding, resulting categories, and exemplary data in Table 2.

4. Findings on the development of digital leadership by changing organizational routines

In this findings section, we dissect the role of artifacts in DL development of 13 routines, as described in interviews with 24 leaders and followers within IT companies. Through these interviews, we found that routines are not changed coincidentally but are intentionally developed through leaders' and followers' use of artifacts in repeated executions of DL routines. These actors use artifacts based on six perceived roles, namely, envisioning, facilitating, empowering, supporting, clarifying, and enforcing. Table 3 provides an overview of the identified roles of artifacts and relates them to the inscribed OAs and their interpretation in PAs. Moreover, in the

Table 3
Roles of artifacts in digital leadership development.

Artifact Roles	Digital Leadership Routines	Described Artifacts	Generalized Pattern (OA) of Routine Inscribed in Artifacts	Application of Artifacts in PA
Envisioning visualizes an attractive future condition of the company	• Purpose and goal setting • Cultural identification and alignment	• Statements • Neologisms	Abstract expressions of objectives and desirable future	Identification with company, but restrained implementation due to doubts about the honesty of artifacts and due to a lack of understanding of relevance for the own work environment
Facilitating offers resources to simplify routines for individuals	• Customer-centric teamwork • Information sharing • Learning	• Software • Incentives • Training • Events, locations • Learning paths • Learning badges • Learning content	Provision of resources to make DL routines possible	High dependence on motivation of individuals to leverage artifacts; fear of missing information if not participating in facilitating artifacts
Empowering provides authority and confidence to individuals	• Working in a permeable hierarchy • Decision-making	• Software • Leadership principles • Communication about removal of status symbols and policies • Principles and policies	Short, general, and actionable phrases as guidance while authorizing individuals to decide and act	Selective usage of empowerment because of hesitance to take on responsibility
Supporting provides help and encouragement without taking over routine performance	• Leader–follower interaction • Career planning	• Conversation frameworks • Key performance indicators (KPIs) • Training • Career development plan	Assistance provided while requiring individuals' proactiveness	Unlocking ownership and proactiveness of individuals
Clarifying adds specification to increase comprehensibility in routines	• Application of values • Hiring decision-making • Upskilling of digital leaders	• Statements • Anecdotes • Leadership principles • Leader skills • Training	Descriptions and explanations of targeted behaviors	Direction in uncertain situations and justification for actions and decisions
Enforcing obliges individuals to comply with rules in routine performance	• Adjustment of leadership styles	• Leadership principles • Penalties • Reporting	Rewards or penalties for actions and behaviors	High focus on overperformance of enforcement mechanisms, such as incentives, though enforcement limits freedom for exploitation

following, Figs. 2 to 14 illustrate these roles based on the inscription of OAs in artifacts (heading of left arrow) and leaders' and followers' interpretation of the artifacts (heading of right arrow), which leads to dynamics of stability or change in the PA (right box).

4.1. Role of envisioning

Interviewees observed certain artifacts as taking an envisioning role in DL development, for example, in the routines of purpose and goal setting as well as cultural identification. Envisioning motivates individuals to visualize an attractive future condition of the company and engages them in contributing to this future condition. In DL development, artifacts in the role of envisioning advance the development of cutting-edge solutions. However, individuals are hesitant to utilize artifacts of envisioning because they can contradict past experiences.

Routine: purpose and goal setting

In the routine of purpose and goal setting, interviewees described the OA of defining the company's purpose for existence. In the PA, followers and leaders employ envisioning artifacts to establish a shared objective and "give individuals the trust and freedom to think about their contribution to that vision" (L7). Interviewees described artifacts of vision and purpose statements as being easily formulated, independent of technology, purposeful, and published on different media, as well as found in locations like the entrances of office buildings: "The vision is like a buoy in the water, obviously identifiable and providing orientation" (L1).

Interviewees pointed out that the artifacts in the role of envisioning guide individuals to visualize their contribution to the OA by aligning their work with their companies' purpose and objectives. However, routine performance also deviates from the OA as some individuals are hesitant when it comes to artifacts in the role of envisioning. This hesitancy results from doubting the honesty of the purpose defined in the OA, as in the past, the vision focused on financial goals. One leader reported that "the vision is two-fold. It sets the customer and user in the center, which is good, but if you drill down, you can see that it is about making revenue" (L11). Moreover, hesitancy of individuals evolves from their lack of ability to break down the vision to the level of their daily work. Based on past experience of leadership following a command-and-control approach, followers reported it as the role of the leader to break down the vision "into OKRs [Objective Key Results] that are assigned to every individual and discussed in performance reviews" (F4). However, certain interviewees also described taking on the envisioning role of artifacts, leading them to "discuss and reflect on how their work contributes to the vision" (L8). As such, DL development leverages artifacts in the role of envisioning to motivate individuals to align their work with the purpose of the company.

Routine: cultural identification and alignment

Interviewees recognized artifacts in the role of envisioning in the routine of cultural identification and alignment in DL development. In this routine, followers and leaders strive for the OA of a culture of "openness and curiosity" (L10), a "reflection and trial-and-error culture" (F7), "trust" (L7), and a growth mindset that is "driven by continuous innovation instead of keeping up with competitors" (L3). In the PA, individuals align their behavior with the company's culture. Interviewees identified artifacts such as cultural statements, events such as failure nights, and neologisms tasking the role of envisioning.

These artifacts encourage individuals to aspire and be part of the company's appealing culture described in the OA. In the PA, the envisioning role of the artifacts creates a feeling of belonging to a unique culture. For instance, interviewees described using neologisms, such as "Googliness", in routines to summarize the unique characteristics of a company's culture (F4), or they reported a general sense of feeling they fit into their work culture: "I like the fast-moving culture. It is very difficult to go back to a more traditional place and bureaucratic approach" (L1). Another finding was that while followers value a trust culture, they struggle with a failure culture, as they fear ramifications: "I felt like none [of my followers] were putting themselves in vulnerable spaces. But that's what you need to do to achieve something new" (L1). Neglecting a failure culture in routine performance could be tracked back to the past company culture, which was characterized by a strong pride and conviction in their achievements. "We did not admit our mistakes but saying extreme things (about competitors) and the crowd was screaming like there was a sacrifice of an animal" (F5). However in developing DL, one interviewee described "cultural change as a requirement for DL" (L13). In this regard, envisioning artifacts allowed individuals

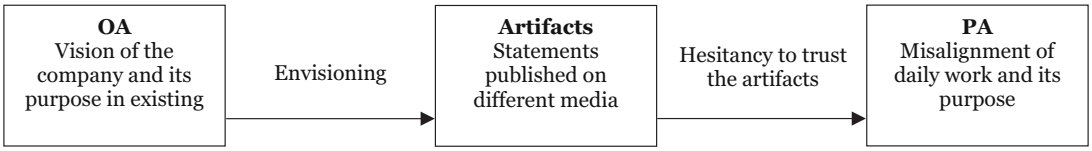

Fig. 2. Routine: purpose and goal setting.

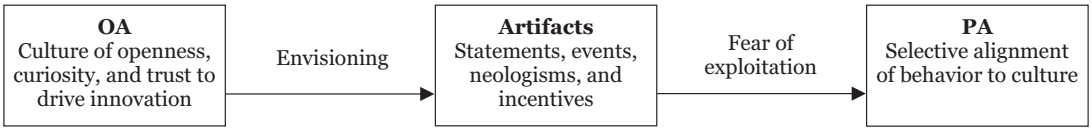

Fig. 3. Routine: cultural identification and alignment.

to picture an appealing culture, which they align their actions toward.

4.2. Role of facilitating

Our analysis of the interviews revealed that artifacts can assume a facilitating role, for example, in the routines of customer-centric teamwork, information sharing, and learning in DL development. In this role, the organization provides resources to followers and leaders to simplify cross-organizational collaboration, information sharing, and learning. By facilitating, followers feel trusted to leverage the provided freedom for their best individual use. However, this role is dependent on the individual leveraging the facilitating artifact.

Routine: customer-centric teamwork

Interviewees described leveraging facilitating artifacts in the routine of customer-centric teamwork. The routine's OA intends to drive customer-centric team collaboration across organizational teams, to "bring the best experts together to serve the customer's needs" (F10). According to the interviewees, in the PA, individuals are motivated to work in "a highly collaborative company" (L03). Interviewees referred to software artifacts as providing the capability of collaborating across disciplines and finding the right knowledge (L09). In addition, individuals described incentives being in place for "helping people and asking for help" (F04).

The facilitating role of artifacts was observed as an invitation to perform actions in accordance with the OA and reach out to individuals in the organization (L01). In the PA, depending on individuals' personalities, there are still individuals who do not leverage facilitating artifacts and instead take actions "totally blocking collaboration" (F04) as they are "used to work as lone wolves, not collaborating" (F3). However, interviewees also reported that facilitating artifacts as leading individuals to collaborate by reaching out to individuals needed in the customer context: "you cannot be successful in this company without working [with] others" (F05). The facilitating role of the artifacts results in simplified collaboration and overcomes barriers in the routine of customer-centric teamwork.

Routine: information sharing

The interviewees mentioned the routine of information sharing, where the OA captures the ability to freely share information internally and externally while upholding confidentiality policies. In the PA, artifacts provide the capability to openly exchange information as everyone can access, distribute, and consume information: "I save information on a shared platform, so everyone can find and consume the information." (F4) Artifacts in a facilitating role address different audiences in information sharing—such as via chat tools, social intranet, and public social media accounts—as well as offer training about managing and increasing the social media impact.

The facilitating role of artifacts provides forums for individuals to share information. In the PA, individuals "enjoy being creative in posting content. We trust that individuals post appropriate content" (L10). However, the format used for sharing information is heterogeneous in routine performance. As such, individuals reported that the written form is used to address a broader audience, whereas information sharing in smaller teams on a detailed level is often verbal. Based on their experience, in which "it was a privilege to have access to specific information" (L12), individuals fear missing out on information that is not written down. "People want to be in every meeting to hear everything directly as they do not trust their co-workers to fully document and share the information." The facilitating role of these artifacts makes it easier for individuals to share information; however, the receipt of information depends on trusting the individuals sharing information that it is complete and correct.

Routine: learning

The routine of learning changes in DL development, with the OA expressing continuous learning. IT companies establish artifacts in a facilitating role, such as structured learning paths and learning events to upskill leaders and followers at scale: "We had trainings that were produced like [a] mini-series on Netflix" (F10). Moreover, they introduce artifacts, including learning days and locations, to create a space for individual learning. Artifacts such as knowledge badges incentivize learning. In the PA, followers see artifacts as enablers that prioritize learning.

This facilitating role of artifacts aims at realizing the OA of continuous learning and knowledge sharing by simplifying the

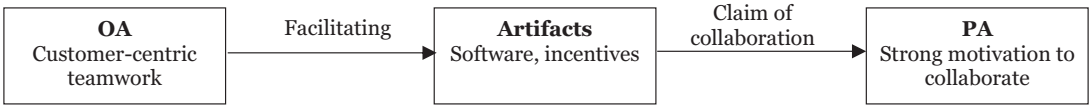

Fig. 4. Routine: customer-centric teamwork.

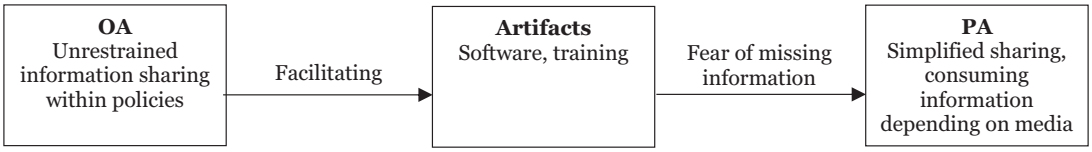

Fig. 5. Routine: information sharing.

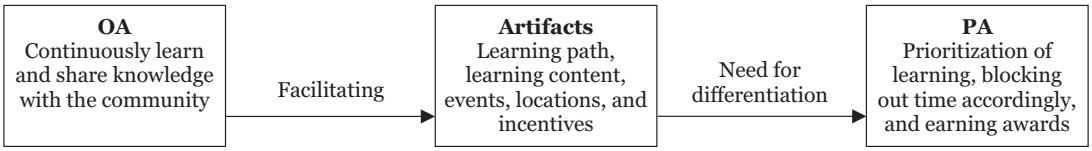

Fig. 6. Routine: learning.

consumption of learning content and making time for learning. In the PA, interviewees reported that blocking time out for learning on set days helps them make time for it. However, interviewees also described that in routine performance, individuals may abuse these facilitating artifacts to "differentiate from the group by collecting badges and awards" (F1) and seek to maximize their personal achievement of incentives instead of sharing knowledge. Routine performance depends on individuals' motivation to leverage these artifacts in a facilitating role, and in certain cases, individuals may not leverage these artifacts or may try to differentiate themselves by heavily using them.

4.3. Role of empowering

Our investigation uncovered artifacts that assume an empowering role, for example, in a permeable hierarchy and decision-making. Empowering artifacts give individuals the authority and confidence to communicate across hierarchical levels and make decisions. Followers and leaders are authorized to act in the best interest of the company within defined guidelines. Empowering targets the self-determination and participation of individuals as they do not follow given work orders but are asked to define by themselves how they want to act and decide.

Routine: working in permeable hierarchy

The interviewees reported empowering artifacts as appearing in the routine of working in a permeable hierarchy during DL development. The OA is described as fostering equality among disciplinary and professional leaders within a permeable hierarchy: "We don't have hierarchies in the classic sense; we have hierarchies, actually a lot, but they are extremely permeable and (…) open" (L13). In the PA, while the organizational structure is still hierarchical, DL fosters a network structure that connects relevant stakeholders based on customer needs. To realize a permeable hierarchy when developing DL, IT companies leverage artifacts in an empowering role, such as communication about removing status symbols or allowing access to collaborative software, to show democratization. Moreover, interviewees pointed out leadership principles as addressing followers as professional leaders and empowering them to reach out to anyone, regardless of hierarchy.

Empowering artifacts thus authorize individuals' actions in the OA of collaborating with individuals of different parts of the organization and hierarchy. In the PA, interviewees expressed that the presence of a structural hierarchy, with defined roles and responsibilities, is important for handling complexity. They evaluated communication about removing physical status symbols, for example, the privilege of having a company car, as "an equality and upgrade of every individual in the company" (F1). However, they also voiced opinions that individuals still need differentiation and want to show their status: "I think this is one of the essentials of people, it doesn't have anything to do with the company" (L5). Therefore, individuals still strive for differentiation through artifacts such as titles: "There are still individuals counting the nodes between them and the CEO" (L12), but the resistance against collaborating with individuals at higher levels in the hierarchy had decreased as individuals felt empowered by these artifacts. In contrast, followers who joined the IT industry from industries with a strong command-and-control hierarchy were hesitant to initiate communication independent of hierarchical levels (L12). Overall, empowering artifacts help individuals to overcome hierarchical thinking by permitting them to collaborate permeably in their organization.

Routine: decision-making

We identified artifacts of empowering in the routine of decision-making. Interviewees highlighted that the OA is to have a distributed decision matrix that enables decisions to be delegated to individuals who have the right knowledge, within the necessary legal and compliance boundaries. In the PA, individuals are permitted to make decisions related to their work environment, to achieve their objectives. Empowering artifacts provide guardrails for compliance; the designed artifacts include ethical policies, such as "do no evil" (L1), and principles that empower decision-making based on a "good instinct and business judgment" (F10).

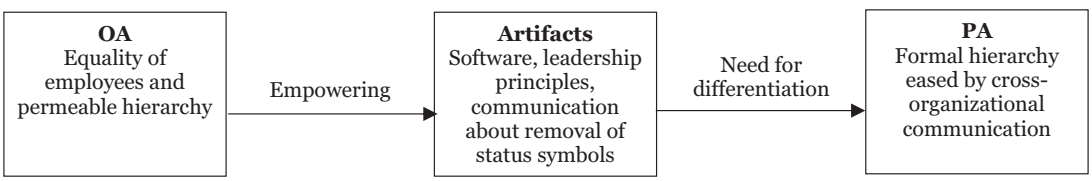

Fig. 7. Routine: working in a permeable hierarchy.

Fig. 8. Routine: decision-making.

Even though individuals are authorized to make decisions, decision-making is heterogeneous in the PA. Leaders pointed out that "there are followers who want to make decisions but not take responsibility for them" (L10). Followers hold back in leveraging their empowerment as in the past, decision-making was highly regulated and the norm was that "for taking a decision, you needed to cascade through the full hierarchy" (L10). Followers fear not having all information relevant to making business decisions, as those in different positions in the hierarchy are perceived as having unequal access to information. In addition, leaders who recently joined the IT industry complained that "everyone can make decisions, but there is no committee you can address to get a final decision" (L12). Hence, these leaders perceive that their responsibility is unclear in the PA where enhanced decision authority is given to followers.

4.4. Role of supporting

Artifacts observed in a supporting role emerged, for example, in the routines of leader–follower interaction and career planning. The supporting role of the artifact helps and encourages individuals in performing the routine or guides them to take charge of initiating the routine. However, in the PA, supporting artifacts are often deprioritized.

Routine: leader–follower interaction

Interviewees described artifacts in the role of supporting in the routine of leader–follower interaction. The routine's OA places followers in the driver's seat and ascribes a coaching position to leaders: "the individual should lead the interaction and benefit from the ideation and coaching skills of the leader" (L3). In the PA, digital leaders coach followers on topics that followers bring up in conversation and help them "to look for answers to the questions that have never been answered" (L8). In the routine of leader–follower interaction, interviewees mentioned artifacts that define the content of the interaction: "We have measurable criteria for the quality of the leader-follower interaction" (L3). For example, conversation frameworks and training aim at increasing the quality of these interactions.

Artifacts in the role of supporting provide general resources such as conversation frameworks that encourage individuals. However, the usage of the artifact depends on its implementation by leaders and followers in their interactions to achieve the OA. In the PA, interviewees criticized how supporting artifacts are interpreted as a second priority after meeting business performance goals: "Of course, you collaborate better when … your leader … shows interest in the follower; however, the transparency of the performance of business is first required" (F1). This deviation from the OA in the PA might have its source in past routine performance, which was limited to "talk[ing] with managers about strict business topics" (F5). To avoid performance-focused interaction and increase the quality of the interaction, followers and leaders use conversation frameworks to structure their interactions, so they gain the most value from those.

Routine: career planning

DL development also leverages artifacts in the role of supporting in the routine of career planning. The OA is to develop and retain talents. In the PA, meanwhile, interviewees reported that "individuals [do]n't do the same job for 5 years, but [they] regularly

Fig. 9. Routine: leader–follower interaction.

Fig. 10. Routine: career planning.

completely makeover and redefine their career with support of [their] leaders" (F3). The artifact of career development plans is employed in a supporting role in this routine.

The supporting artifact makes individuals responsible for their career planning, with the help and encouragement of leaders. However, in the PA, followers reported that career planning is neglected in day-to-day business. Moreover, with increasing experience, followers experienced limitations in starting a new career path, as leaders were not willing to invest in their ramp-up: "The company is open to cross-vertical hiring; however, with a specific salary, I want to gain value out of the high salary" (L10). To mitigate these limitations in the routine of career planning, interviewees emphasized the need to increase transparency about competency levels for professional careers, to demonstrate how experienced people offer value outside their job-specific skills.

4.5. Role of clarifying

The analysis of the interviews showed that artifacts can assume a clarifying role, for example, in the routines of applying values, making decisions about hiring, and upskilling digital leaders. The clarifying role adds specifications and explanations, to avoid deviation in routine performance. As such, artifacts in this role serve to orientate individuals and align their actions with the OA.

Routine: application of values

Our investigation revealed that DL development leverages clarifying artifacts in the routine of applying the company's values. The interviewees mentioned new sets of company values in the OA: "In the development process of DL, we did a hard value assessment, and three positive values remained" (L13). These values were respect, accountability, and authenticity. In the PA, the value statements for daily interactions in business and the behavioral compass were cited, which are used as mechanisms for justifying actions. The interviewees identified clarifying artifacts in the form of written practical examples of how to implement these values. Artifacts, such as value statements, are also connected to leaders' personal statements and stories, which offer clarification and give practical guidance: "There is an anecdote behind every value from our top-level management" (F19).

The clarifying artifact is consulted by individuals seeking to gain further specifications in the PA when they are unsure how to act in alignment with the OA: "The values keep us grounded and honest in difficult times and help us make hard decisions without regrets" (L8). However, the implementation of the values in the PA is also "highly influenced by (…) the individual" (L7). Leaders reported that they carefully checked the alignment of the company's values with their own values before accepting the job offer for their position (L4). Others prioritize their own values and intentionally deviate from company values. In the routine of applying values, clarifying artifacts specify how to behave according to the company values, albeit individuals can decide to deviate from those values.

Routine: hiring decision-making

In the routine of hiring decision-making, interviewees also observed artifacts in the role of clarifying. This routine rests on the OA of hiring people who strive to continuously learn. In the PA, criteria defining the ability of the candidate to learn, thrive, and develop a career in the company are used to make hiring decisions. Interviewees identified leadership principles as clarifying artifacts, which encourage the hiring of those with a growth attitude rather than those with a skill fit.

Even though, in the PA, individuals advocate for hiring based on behavioral characteristics of candidates that align with the OA, leaders may disregard the clarifying role of these artifacts. Because of the lack of standardization and evaluation of documented hiring criteria, leaders may base their hiring decisions on individual evaluations: "We have no aligned criteria that define a good candidate. Now, the leader says, this person is good and gets hired" (L9). In these instances, leaders mitigate risks and steer onboarding efforts by hiring according to the best skill fit, and not in the long-term interest of the company (i.e., candidates' growth mindset). However, interviewees point out that ignoring the leadership principles will only lead to short-term success. Instead, following the clarifying artifacts and "hiring talents motivated to continuously develop" (L3) are key practices required for DL development.

Routine: upskilling of digital leaders

Interviewees described clarifying artifacts in the routine of upskilling digital leaders. They viewed the OA of this routine as

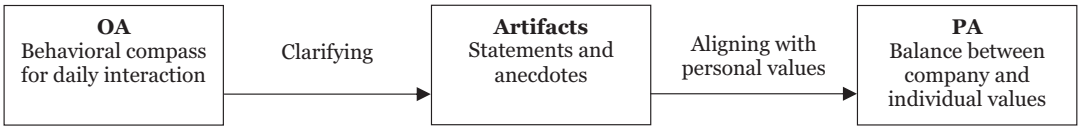

Fig. 11. Routine: application of values.

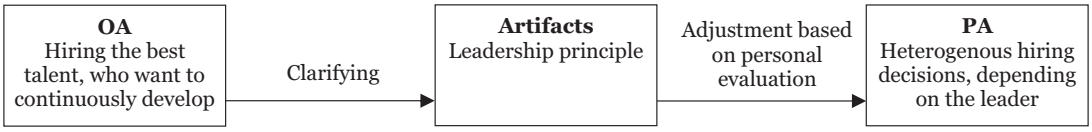

Fig. 12. Routine: hiring decision-making.

Fig. 13. Routine: upskilling digital leaders.

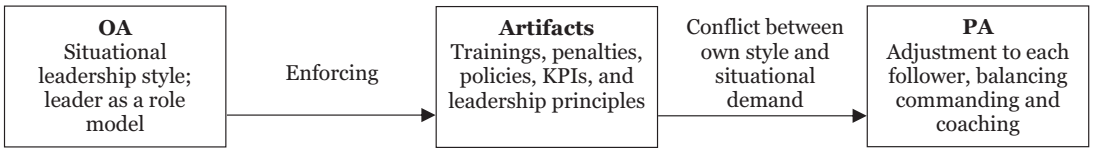

Fig. 14. Routine: adjustment of leadership style.

empowering individuals to succeed in their jobs and energizing them to pursue their individual ambitions. In the PA, interviewees observed an increasing appearance of empathy, communication, and technical skills. In regard to developing these skills, leaders refer to clarifying artifacts such as documented, abstractly phrased leader skills and training offerings.

Interviewees described artifacts that serve as a reminder of the OA during daily leadership activities, guiding leader behaviors. In the PA, they emphasized the importance of communication skills for increasing transparency about leadership development. Moreover, personal attributes—such as empathy, authenticity, and charisma—are important to "be able to align followers to the company's goals" (L5). Particularly, followers noted the ability to give "constructive feedback but [have a] positive mindset heading into the future" (F1). Interestingly, technical skills were frequently discussed by interviewees as important for leaders to "know what the market trends are" (L5) and "coach followers by asking constructive questions about how to achieve a goal" (L9). Leaders may avoid upskilling by instead compensating for their missing skills through a reliance on followers.

4.6. Role of enforcing

Interviewees discussed artifacts that assume an enforcing role, for example, in the routine of adjusting leadership styles. DL as a leadership approach can leverage different leadership styles, such as transformational or transactional (Antonakis et al., 2003). In DL development, enforcing artifacts achieve alignment with the OA by obliging individuals to follow fundamental principles of DL. They ensure individuals are knowledgeable about these principles and apply them in routine performance. These artifacts include some that penalize deviations from the OA in the routine PA.

Routine: adjustment of leadership style

We found that enforcing artifacts are used in DL development in the routine of adjusting leadership styles. The OA consists of a situational leadership style aligned with team demands: "at the end, it is about building a high-performing team" (L11). In the PA, leaders coach followers and act as role models: "How should followers learn the new culture if their leaders still live in the old world?" (L7). To train leaders, IT companies run mandatory training in situational leadership styles and coaching approaches. Moreover, the set KPIs force leaders to hold regular team and individual meetings with their followers, to uphold a situational leadership style. Interviewees also described artifacts in the role of enforcing, which penalize leaders who act contrary to the leadership principles: "Leaders who do not follow the principles get dried out" (F9).

Hence, artifacts in the role of enforcing train and oblige leaders to follow the OA through the PA and penalize non-compliance. In this way, they ensure that leaders follow fundamental principles in the routine PA. However, interviewees reported a varied adoption of leadership styles in routine performance and described leaders as facing challenges in empathically understanding followers' situations and adjusting their leadership accordingly: "Leaders need [to] balance different leadership styles based on the follower's needs … You need to be sensitive: some people need coaching, some clear direction, [and] some need support" (L3). Therefore, based on the rate of adjustment per follower, a great variety of leadership styles can be observed in the IT industry. However, if leaders fall back to an authoritarian leadership style, followers feel misunderstood by their leaders: "I experienced these authoritarian managers that told you when to breath and how to breath." (F6). Amid the great variety of leadership styles, artifacts of enforcing are leveraged to penalize the use of styles not following the set leadership principles, ensuring that fundamental constituents are not violated in DL development.

5. Discussion and conclusions

In this paper, we uncovered that leaders' and followers' use of artifacts in DL development reflects six roles, namely, envisioning, facilitating, empowering, supporting, clarifying, and enforcing. Our findings show that DL development emerges from individuals' use of artifacts when performing DL routines. These artifacts inscribe abstract patterns of DL (the OA) into the performance of routines (the PA). By taking a routine perspective, we shift the narrative of this research field from describing the constituents of DL to exploring its

development. Specifically, we contribute to DL development research by shedding light on DL development, theorizing six roles of artifacts in that development, and examining the role of followers. Within this discussion, we detail those contributions, present four implications for practice, and address this study's limitations as well as future research opportunities.

5.1. Advancing digital leadership development from a routines-perspective

With this study, we make three contributions to understanding DL development from an organizational-routines-perspective. First, we show that DL constituents are not static but dynamic as they emerge from the situational context of DL routines' performance. Thus, we can understand DL constituents as emerging from continuous DL development. Second, we theorize the six artifact roles identified in our study as stabilizing or flexibilizing DL routines. Third, having examined leaders and followers, we extend DL development beyond training digital leaders to developing leader–follower interactions. This extension applies not only to DL development but to leadership development, in general.

First, the narrative shift extends DL research by basing DL development on the situational interpretation of artifacts instead of considering it as the sum of homogenously described constituents. Today, research primarily highlights constituents such as cross-team collaboration (Oberer & Erkollar, 2018), an organizational vision (Hearsum, 2015), and an open, innovative culture (Petrucci & Rivera, 2018). We contribute by uncovering a variety of implementations of the constituents of DL, which develop in repetitive actions as part of the routines of an organization. In contrast, actions that are not repeated are random and therefore cannot be structurally defined and developed as part of DL. Our contribution strengthens the understanding of how theoretical descriptions of DL are realized in practice. As such, artifacts in the role of envisioning drive an innovative vision and culture as people align their work with those. Artifacts in the role of facilitating, meanwhile, give individuals resources that simplify continuous learning, information sharing, and customer-centric teamwork by emphasizing trust in individuals that they will use the provided resources for the best interest of the company. Moreover, individuals take over responsibility and show self-organization in preparing for follower–leader interactions, resulting from supporting artifacts. These artifacts also result in proactiveness and self-driven career development activities of individuals. Next, the artifact role of empowerment emphasizes entrepreneurial thinking among individuals by enabling them to make decisions and collaborate with individuals in a permeable hierarchy independent of set hierarchical levels. The clarifying artifacts then support people in evaluating their behavior, leading to a stronger alignment with company values and criteria for decision-making and leadership skills. Lastly, artifacts in the role of enforcing realize a baseline for leadership styles, ensuring that no contradicting leadership occurs. Although our investigation showed that the outcomes of these artifact roles can be observed repeatedly, the theoretical lens of routines helped to reveal that the execution of the OA via artifacts is heterogeneous and not deterministic in the PA of routines. Artifacts do not always fit all contexts and work situations and are therefore enacted differently depending on the situation. The homogenous description of DL's constituents in the extant literature does not consider situational deviation (Temelkova, 2018; Wade & Obwegeser, 2019). However, our study shows that in the PA, leaders and followers diversely interpret artifacts, resulting in situational deviation from the homogenous description of constituents in the PA. Hence, we show that DL cannot be understood from descriptions of its constituents, but by the constituents' implementation based on the situational context in the PA of routines.

Second, we contribute to research on DL development by identifying six roles of artifacts in DL development. These artifacts can trigger routine dynamics of stabilizing (i.e., enforcing or clarifying artifacts) or flexibilizing (i.e., empowering, facilitating, supporting, or envisioning artifacts). When triggering stabilizing dynamics, artifacts aim to minimize deviations of routine performance from the OA. On the contrary, artifact roles that trigger flexibilizing dynamics encourage individuals to diversify their routine performance based on the specific context. This proposal contrasts with the previous literature by framing artifacts in DL development as not only carriers of DL descriptions (Manimala & Wasdani, 2013), such as the vacation policy of Netflix (McCord, 2014), but as playing a central role in developing DL routines. Our investigations suggest that artifacts are intentionally designed to not only inscribe the OA but also to play an active role in reconfiguring routines through the use of artifacts by followers and leaders (Ribes et al., 2013). Therefore, artifacts' influence on routines extends beyond the tangible (Dionysiou & Tsoukas, 2013). For example, the supporting artifact of conversation frameworks in the routine of leader–follower interaction triggers a flexibilizing dynamic. While the artifact helps structure conversations, followers can freely create meeting agendas, which increases their self-determination. In addition, this dynamic can be observed in Netflix's vacation policy (McCord, 2014), which symbolizes empowerment, and with that, trust in followers' judgment to responsibly manage their days off. Our investigation suggests that flexibilizing dynamics foster innovation and creativity (Petrucci & Rivera, 2018) in developing DL.

We also found artifact roles that trigger stabilizing dynamics (i.e., enforcing and clarifying). In DL development, these stabilizing dynamics seem contrary to DL characteristics of trust, creativity, empowerment, and self-organization (El Sawy et al., 2016; Gierlich-Joas et al., 2020; Oberer & Erkollar, 2018). Instead, they follow the intention of minimizing deviations from the OA in the PA, and thereby limit creativity and innovativeness. This finding presents a contradiction between DL development and its constituents. However, stabilizing dynamics are important to ensure the execution of specific DL routines according to the OA. While DL constituents emphasize trust and empowerment, organizations that develop DL must ensure that individuals implement foundational DL constituents. Thus, our findings demonstrate the importance of understanding the roles of artifacts that individuals employ, and how those influence routine performance. For example, the literature ascribes roles to software artifacts in triggering stabilizing dynamics because software features constrain routine performance as you cannot perform an action in a software without having access to the respective functionality (Ribes et al., 2013). In contrast, in DL development, leaders and followers perceive software as facilitating routine performance entailing flexibilizing dynamics (Braojos et al., 2024). These contradictory observations advance our understanding of DL constituents. Rather than assuming that a leadership approach must reflect these constituents to be DL, we show that DL constituents situationally emerge from the performance of routines, which differs between individuals. Based on the analysis, we show

that the different roles of artifacts are all necessary for DL development, which even requires the implementation of conflicting constituents of DL, such as setting strict rules in governance while also empowering individuals and encouraging their creativity (Petrucci & Rivera, 2018; Valentine & Stewart, 2015; Westerman et al., 2014).

Surprisingly, the role of previous artifacts may even change in DL development. For example, an agile network structure (Oberer & Erkollar, 2018; Schwarzmüller et al., 2018) is described as a constituent of DL. This suggests that artifact such as organigrams showing the company's hierarchy must be removed to achieve a network structure. However, according to the interviewees, IT companies are still structured in complex hierarchies, with several levels determining roles and responsibilities in the organization. Interestingly, the hierarchy remained, however, its role changed in DL development. In the past, the hierarchical structure had a stabilizing role in limiting communication across hierarchies, where individuals felt banned from reaching out to those of other hierarchical levels. In DL, the hierarchical structure is made permeable caused by artifacts in roles introducing flexibilizing dynamics. To achieve permeability in the hierarchy, artifacts in the role of empowering authorize and encourage individuals to collaborate independently of their hierarchical position. Based on these findings, we advocate for a shift in the narrative of DL research from descriptions of artifacts as DL constituents to the recognition that artifacts in defined roles trigger stabilizing and flexibilizing dynamics, which allow for developing DL routines.

Our insights into how artifacts trigger these dynamics in DL development have implications for the leadership style as a constituent of the DL approach. In DL theory, there is a lack of clarity about the leadership style. Research mainly emphasizes a transformational style, motivating followers by aligning them toward a shared vision (April & Dalwai, 2019; Prince, 2018). Our investigation instead shows that DL leverages different leadership styles. The dynamics in DL development suggest that individuals use both transactional (i.e., stabilizing) and transformational (i.e., flexibilizing) leadership styles, a finding supported by the six identified artifact roles. Although a transformational leadership style dominates the previous literature (April & Dalwai, 2019; Prince, 2018), we assert that aspects of a transactional leadership style such as defining clear objectives rewarded with incentives are also part of DL (McCleskey, 2014). Hence, our findings advance the understanding of the leadership styles in DL, leading us to put forward the idea of combined transactional and transformational leadership depending on the situational context.

Third, we contribute to DL literature by revealing that DL is not only developed by training digital leaders (Adie et al., 2024; Bennis, 2013; Kane et al., 2019; Klein, 2020; Klus & Müller, 2018; Ongena et al., 2024; Tigre et al., 2024), but by developing the routine performance via the interplay of artifacts, leaders, and followers. As such, "artifacts do not act deliberately" (Da Costa Junior et al., 2024, p. 9); instead, their influence on routine performance is highly dependent on human actors. In this vein, our findings show that artifacts do not initialize but influence DL development. This influence emerges from leaders' and followers' interpretation of the artifacts in the PA (i.e., perceived role). While some artifacts pertain to leaders (e.g., leadership principles), others (e.g., artifacts published organization-wide) influence not only leaders but also leader–follower interactions. The current literature focuses on how we understand and develop the competencies of leaders in DL (Day, 2001; Kane et al., 2019; Klus & Müller, 2021), but our study points out that in addition to the leader, DL development needs to address followers and analyze and develop their competencies. In particular, artifacts with the roles of empowering and facilitating encourage followers to define their actions in routines' PA. If competencies of followers for the empowerment are not developed, our findings show that in the PA, followers are hesitant and insecure in using DL artifacts. For example, artifacts empower followers in decision-making. However, if their competencies in decision-making are not developed, followers may not trust an artifact's empowerment, as they do not have the confidence and skills needed to evaluate the impacts of decisions, which are required in order to make them. Hence, followers might impede the potential achievement of accelerated business outcomes as they postpone or avoid making the required decisions. Hence, DL development is not limited to the leader but is also required for followers to enable them to fulfill the routines of DL. This finding suggests a need for further training of followers regarding DL. Research into DL development needs to further our understanding of the competencies of followers and how best to train them.

In favor of shifting the narrative from describing the constituents of DL to understanding leadership development at the routine level, we argue that artifact-based development of DL routines is not limited to DL but can be transferred to the development of other leadership approaches. Modern leadership approaches, especially DL, are not building on the idea of authoritarian leaders, but aim at democratizing leadership activities such as decision-making among followers and leaders (Benitez et al., 2022). Focusing solely on the development of the leader may even prevent the development of DL, as our study shows that if followers observe conflicts between an artifact and leadership skills, they deviate from the artifact in the PA to find a compromise that is appropriate for the specific situation in order to avoid tensions. As such, a visionary leader needs flexibilizing artifacts in order to give freedom to followers so they can embrace DL (Klus & Müller, 2018). Otherwise, individuals selectively choose to use the pleasing parts of an artifact and ignore its unpopular aspects. Instead of focusing on leaders' skills, the shift in the narrative holds that artifacts with different roles are combined to develop DL. As such, Day (2001) points out that leadership development so far ignores "almost 50 years of research showing leadership to be a complex interaction between the … leader and the social and organizational environment" (p. 583). Developing leadership through routines reflects the organizational environment and highlights the adjustment of the leader and follower based on the situation in the PA. Hence, developing leadership based on artifacts manifesting routines is not specific to DL; in contrast, we argue that the artifacts of a company influence leaders' and followers' behavior in routines no matter whether it is intended or not. Our investigation on developing DL based on artifacts in six roles suggests that artifacts can be leveraged to improve the development of leadership approaches, for instance, by intentionally positioning testimonials for individuals to use to evaluate and adjust their behavior in the PA. Our study for the first time shows leadership development from the perspective of routines manifested by these six artifact roles. We assert that this perspective is valuable for leadership development, in general, and especially for leadership approaches distributing leadership tasks among leaders and followers, as artifacts can be easily distributed among the organization by digital technology. As such, followers and leaders in leadership development can be addressed at scale by artifacts in different roles.

5.2. Practical implications for digital leadership development

For practitioners, our findings have the following four implications for DL development. First, as organizational behavior is built on routines, our results may inspire transformation and change leaders to consider the OA and how leaders and followers leverage artifacts in the six outlined roles to transmit the OA to the PA. In that regard, practitioners may start by analyzing and defining their requirements for a routine in DL development, including the OA. Following that, the organization must define the roles of artifacts required for DL development in this routine. Then, artifacts in the pre-defined roles can be designed, with the motivation that the intentional design of routines helps in changing routines (Glaser, 2017). However, it should be recognized that the front-loaded intention of the artifact designed by the organization (e.g., transformation or change leaders) is not deterministic; instead, our findings show that its role is defined by how it is perceived by leaders and followers, which guides the role they ascribe to the artifact. To develop a better understanding of DL development, organizations should focus on the PA and how individuals enact defined guidelines of the OA in their daily work.

Second, we recommend that practitioners measure the effectiveness of DL development based on the artifact's role. In the past, 360-degree feedback and leadership assessments were used in practice to evaluate the effectiveness of leadership development (Day, Fleenor, Atwater, Sturm, & McKee, 2014). For example, interviewees described that artifacts of an open culture are implemented; however, the facet of an error culture in the artifact is ignored as it is inconvenient for individuals to be transparent about their mistakes. We argue that the success of an artifact in DL development in routines can only be evaluated by considering the artifact's roles. The enactment of an artifact succeeds if the intended behavior can be observed afterward. However, this behavior needs to be compared more or less strictly against the content of the artifact based on its role in introducing dynamics of flexibility or stability. Hence, the evaluation of the effectiveness of DL development in practice needs to consider the role of the artifact and the degree of observed deviation of the routine performance compared to the OA.

Third, a takeaway from our investigation is that practitioners need not only think about implementing new artifacts in DL but also assess existing artifacts shaping the company's context. As such, practitioners must investigate contextual factors influencing individuals toward deviating from the pre-defined roles of artifacts. These factors can be personal, such as past experience, need for differentiation, or missing competency, or contradicting artifacts that need to be adjusted or removed. Our investigation aligns with the literature in demonstrating that in the interaction of the artifact with individuals, leaders and followers are influenced by contextual factors in evaluating if and how they follow the artifact in its role (Becker et al., 2005; Dionysiou & Tsoukas, 2013). In particular, we propose that individuals striving for differentiation and individually outstanding employees are driven to deviate from the artifact and the OA. In addition, behavior that led to success under the past leadership, such as following orders and avoiding risks, leads individuals to neglect the role of the artifact or ask for more clarity and guidance (e.g., in the routine of purpose and goal setting). These observations lead us to recommend that when changing the routines in DL development, practitioners need to observe and evaluate how individuals leverage the roles of artifacts in the PA and recreate and adjust artifacts to recreate routines (Dionysiou & Tsoukas, 2013).

Fourth, artifacts support DL development, but their usage in the PA is highly dependent on the individual. For example, when using less prescriptive artifacts to serve the role of empowerment, followers and leaders struggle with a lack of guidance on how to use that empowerment. However, empowerment is not only a question of being authorized to perform a specific task but also a question of individuals having the competence to meet the expectation that accompanies the action. For example, in the routine of decision-making, interviewees pointed out that they do not have the necessary information to make decisions. We suggest that information, and competency to access and consume that information, may be factors that are commonly missing, which is why individuals ask for further guidance. To address this situation, practitioners may benefit from evaluating the skills required of leaders and followers in targeted leadership routines before implementing them. Besides assessing skills, practitioners may also leverage supporting actions such as communication of artifacts and their intended usage in the PA.

6. Limitations and future research

This study does not come without limitations. First, the description of artifacts by interviewees and the actual content of artifacts may vary. However, our study focuses on the roles of artifacts in the development of DL independent of its actual content. Nevertheless, we observe that the organizational action of creating and introducing new artifacts to fill a certain role is an interesting area for future research. Second, while the interviewees' descriptions at the organizational and individual levels were rather homogenous, we saw varied answers to questions addressing leaders, which may represent a limitation of our interview setup. For instance, when discussing organization-wide routines, interviewees drew from diverse experiences of DL development in their organizations. Across the 24 interviews, our findings showed a balanced view of their understanding of DL development; when discussing leader-specific aspects of routines, however, they tended to relate to experiences with specific leaders, thus drawing on a limited pool of experiences. Their descriptions of leaders were heterogeneous as the interviewees described different leaders. We tried to mitigate this limitation by speaking with more interviewees and ensuring they had many years of experience, in which they had worked with many leaders over time, allowing the interviewees to give descriptions of a variety of leaders. Third, this research did not map out the chronological sequence with which artifacts in different roles are leveraged in DL development to trigger routine dynamics. In this development process, artifacts may change, disappear, or be adjusted over time. The present study does not cover that process in detail. Fourth, this study focuses on the roles of artifacts in DL development by leveraging the theoretical lens of routines, which underpins the explanatory power of our study of the observed phenomenon. With that said, different theoretical lenses (e.g., boundary objects) might introduce further and/or different explanations for artifact-based DL development.

Despite these limitations, we propose that the six artifact roles identified for developing DL by flexibilizing and stabilizing routine dynamics provide an interesting new perspective to inform future research on DL. As our study did not investigate the process of designing and introducing artifacts, we suggest that future research should perform long-term investigations of DL following the lifecycle of artifacts. In this vein, future research may leverage design science research to design and evaluate artifacts in pre-defined roles. Possible research questions are the following: "*Which design principles and design features should an artifact follow to develop digital leadership routines in organizations?*" and "*How do artifacts and their roles evolve over time in DL development—from design to deprecation?*" In addition, we acknowledge that the idea of leveraging artifacts in DL development is only one puzzle piece. Future research may investigate the interconnection between artifacts and other leadership development instruments. Moreover, we investigated the role of artifacts in developing DL at the routine level. However, there may also be an interplay of multiple artifacts with different roles within a routine, which has not yet been subject to research. For this, we suggest an ethnographic research approach tackling the research question of *"How do leadership development instruments influence the implementation of new leadership approaches?"* Our investigation also failed to measure the effectiveness of artifacts in terms of practical outcomes. We theorize that artifacts have a role in developing DL at the routine level based on what we observed in practice. However, the causality between artifacts' roles and practical outcomes must be subject to future quantitative research. Lastly, our investigations show that artifacts for DL development in routines are not limited in their use to leaders but also involve followers. Hence, extending DL research toward understanding the competencies of followers in taking over responsibilities such as decision-making provides an interesting area for future research. This research gap could be addressed by utilizing grounded theory to investigate the research question of *"Which competency do followers need in digital leadership?"* Moreover, our findings uncovered how the execution of DL depends on the situational context. In that regard, a context analysis based on a case study could answer the research question of *"Which context factors trigger leaders and followers to deviate from the OA in the PA?"* That dependency was not considered in the present research and stands as a research gap worthy of investigation.

CRediT authorship contribution statement

Julia Katharina Eberl: Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Markus Philipp Zimmer:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis, Conceptualization. **Paul Drews:** Writing – review & editing, Supervision, Conceptualization.

Appendix A. Interview questions for followers and leaders

A.1. Introduction and objective of the interview

This study focuses on digital leadership IT industry from a leadership and followership perspective. The study aims to understand the process of developing DL in the IT industry. We guarantee that we will not publish any information that would allow the disclosure of the identities of the interviewees and their companies. To give you our full attention during the interview, we would like to record this interview digitally.

A.1.1. Category 1: Introduction

Introduction: The information from this interview and all others will be evaluated and published in such a way that no conclusions can be drawn about the interview participants and their companies.

Questions:

- Please introduce yourself and your position in the company.
- What are your current responsibilities and tasks?
- *Followers only:* How long have you been working under your current manager?
- *Leaders only:* How long have you been working in disciplinary leadership positions? How many people are currently in your team? On which level of the organization are you positioned?

A.1.2. Category 2: current digital leadership in the information technology industry

Introduction: The following concerns your current leadership during daily business in the company.

Questions:

Digital Leader

How would you describe the leadership style in the company today?

Followers only: How would you describe the leadership style of your manager today?

Leaders only: How would you describe your own leadership style?

What skills do you consider important for a leader in your company?

Individual Level

Followers only: How would you describe people management in one-on-one interactions with your manager?

Leaders only: How would you describe people management in one-on-one interactions with your followers?

Followers only: How would you describe the current development opportunities and needs for development as an employee?

Leaders only: How would you describe the current development opportunities and needs for development as a follower and a

leader?
How do you communicate and collaborate in the company today?
Is there an adjustment in collaboration and communication through virtual cooperation?
Organizational Level
What role does the company's vision play in your manager's leadership activities?
What role do the company's values play?
How would you describe the company culture in your company?
How would you describe the organizational structure in the company?
How would you describe processes in general and decision-making processes in particular in the company?
Followers only: What role does governance play in your daily work?
Leaders only: What role does governance play in your leadership performance?
Follow-up Questions
How do you perceive the target image/ideal state of DL your company is aiming for?
What are the challenges in reaching this ideal state today?
Are there any testimonials or rules that influence your descriptions?

A.1.3. Category 3: development of digital leadership
Introduction: We now want to look at the development and changes in leadership up to the current state.
Questions:
How was leadership practiced in the past, and what has changed?
Follow-up: Were there changes in leadership?
Regarding the skills and style of the Digital Leader
Was there any testimonial or rule that led to the change?
Regarding the leadership of employees (e.g., measurement systems, incentives, communication)
Was there any testimonial or rule that led to the change?
Regarding the design of the organization (structure, vision, culture)
Was there any testimonial or rule that led to the change?
Was there an event in the past that triggered a change in leadership?

A.1.4. Category 4: final question
Introduction: Introduce accordingly.
Question:

- Do you have any further comments on the topic of DL?

Data availability

The authors do not have permission to share data.

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