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HOW TO ESTABLISH A DIGITAL ORGANIZATIONAL CULTURE: INSIGHTS FROM A MULTIPLE CASE STUDY

Research Paper

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Abstract

Digital transformation poses numerous challenges for established companies that need to change their established processes and routines. To enable successful digital transformation, the organizational culture must be adapted to the new requirements of an increasingly digitized environment. To date, however, we know very little about what a digital organizational culture looks like and how it can be established in incumbent companies. To address this shortcoming, we conducted a multiple case study with seven cases in different industries. Our findings allow us to discuss the concept of "digital organizational culture" in detail and develop a model that provides actionable insights into how such a culture can be established. Finally, we highlight opportunities for future research.

Keywords: Digital Organizational Culture, Digital Transformation, Digital Culture, Cultural Change

1 Introduction

Digital transformation was originally conceptualized as a primarily technical topic, focusing on how to transform products and processes (Morakanyane et al., 2017). With the rapid proliferation of digital technologies such as social media, mobile technology (Fitzgerald, 2013), Internet of Things (Ceipek et al., 2021), or Big Data (Dremel et al., 2017), digital transformation is increasingly viewed as a more encompassing concept that requires changes in nearly every aspect of an organization (Wessel et al., 2021). Research has produced insights that organizational culture is a central element for the successful management of digital transformation (Duerr et al., 2018; Vial, 2019). Organizational culture, which is defined in a simplified manner as "the way we do things around here" (Deal and Kennedy, 1983, p. 501), is a key component when managing digital transformation (Hartl, 2019). Initial findings show that the digital organizational culture is characterized, among other things, by a high degree of agility (Duerr et al., 2018; Hartl and Hess, 2017; Leonhardt et al., 2017) and an increased willingness to take risks (Fehér and Varga, 2017; Hartl and Hess, 2017). Furthermore, a higher tolerance for failure (Duerr et al., 2018; Hartl and Hess, 2017), cross-functional and temporary teams (Duerr et al., 2018; Maedche, 2016), and motivating and trusting leadership styles that foster change (Agarwal et al., 2011) are essential.

So far, however, research on digital organizational culture is sparse (Vial, 2019), leaving us with limited insights into what constitutes a digital organizational culture and even fewer insights into how to establish a functional digital organizational culture that enables a successful digital transformation. Thus, there are persisting calls in the literature to develop a better understanding of "what a digital culture looks like" (Kane et al., 2016, p. 10), which is further underscored by more recent research that concludes that we "should further investigate the digital culture so that firms are able to consciously shape it" (Duerr et al., 2018, p. 5134). We follow up on these calls for research by taking a closer look at what constitutes the concept of digital organizational culture as a first step. Our first research question is, therefore: *RQ1: What constitutes an effective digital organizational culture that enables digital transformation?*

In a second step, we take a closer look at how the digital organizational culture can be proactively shaped to successfully manage digital transformation. Thereby, we directly address recent calls for research on how such a “target culture can be achieved” (Hartl and Hess, 2017, p. 9). Therefore our second research question is: *RQ2: How can organizations establish an effective digital organizational culture?*

In the following, we first clarify basic concepts, distinguish them from one another and, building on this, develop a definition for the term digital organizational culture. We then present the relevant literature before explaining our methodology in detail. After that we present our results and conclude by discussing their implications.

2 Theoretical Background

2.1 Organizational Culture and Digital Transformation

Culture has been studied across various disciplines such as anthropology, sociology, psychology, and economics (Taras et al., 2009). In management research, the construct of culture came into focus in the early 1980s (Hofstede, 1980; Schein, 1984). Taras et al. (2009, p. 359) define culture as follows: “Culture is a group's shared set of distinct basic assumptions, values, practices, and artifacts that are formed and retained over a long period of time”. Similarly, numerous definitions for organizational culture exist, which refer only to the activities and members within an organization. For this paper, we follow the definition of Schein (2010, p. 18): “The culture of a group can now be defined as a pattern of shared basic assumptions learned by a group as it solved its problems of external adaption and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”. The concepts of culture and organizational culture are therefore closely related at their core: Both describe a “shared set/pattern of basic assumptions”. The term organizational culture is more specific to the extent that it refers only to the members of an organization.

Schein (2010) distinguishes between artifacts, beliefs and values, and basic assumptions, which differ in the visibility and observability of cultural elements. While artifacts are easily perceived through sensory perceptions, values and basic assumptions are intangible – they are not immediately perceivable. **(1) Artifacts** are easily observable by outsiders since it is possible to see, feel, or even hear them. Artifacts include cultural aspects such as the language, the behavior of its members, customs, rituals, technologies, the architecture of the environment, and the style reflected in clothing and the expression of emotions, for example. It should be mentioned that this level is difficult to interpret or decipher despite its easy observability. Therefore, the individual phenomena are visible but can have different meanings in different cultures. This means that similar artifacts can be observed in two cultures; however, it is not possible to recognize their background and meaning by observation alone. **(2) Beliefs and values** are not visible. External parties can therefore not recognize the beliefs and values within an organization through pure sensory perception. Beliefs and values thus explain an essential part of human behavior within organizations - but they do not explain it completely. Therefore, the third level must be considered. **(3) Basic assumptions** are not visible, and members of a culture are usually unaware of them because they are accepted as self-evident. Basic assumptions are unconscious and are taken for granted by organization members. They can only be changed if a change in beliefs and values is successful in the long term. If members perceive a difference between basic assumptions and reality, they often deny reality. This psychological process underscores that “culture has its ultimate power” (Schein, 2010, p. 29). However, since culture ultimately changes if the basic assumptions change, this is a difficult and lengthy process.

In recent years, research on digital transformation has been intensified within strategic IS research (Piccinini et al., 2015). Nevertheless, some researchers note a conceptual lack regarding the definition of the phenomenon of digital transformation and related strategies (Matt et al., 2015). Based on a literature review, Vial (2019, p. 121) defines digital transformation as “a process that aims to improve an

entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies". In addition to the opportunities for improvement highlighted by this definition, however, digital transformation also poses major challenges for practicing companies (Vial, 2019; Wessel et al., 2021). Digital business models allow new competitors to enter the market overnight or existing competitors to quickly outpace them. Digital transformation confronts companies with a need for change that exceeds technological factors. "The way we do things around here" – in other words, the organizational culture – must change to manage a transformation successfully. Hartl (2019, p. 1) describes cultural change management as "crucial for the success of digital transformation". Therefore, it requires a special type of organizational culture that enables digital transformation – digital organizational culture. The term digital organizational culture has been addressed sporadically in the existing literature but lacks conceptual clarity, which is often the case for digital phenomena (Hund et al., 2021). Using the term digital organizational culture, we refer to a specific type of organizational culture that meets the challenges of digital transformation. Therefore, we define digital organizational culture as a specific shared set of basic assumptions, values, practices, and artifacts which aim to meet the challenges and requirements posed by digital transformation.

Therefore, digital organizational culture is related to the more general term organizational culture. With this definition, we also show the conceptual relationship between the two constructs: A digital organizational culture supports and enables digital transformation. In order to manage the digital transformation successfully, the organizational culture must be actively shaped.

2.2 Digital Organizational Culture – State of Research

Organizational culture is a key component in successfully mastering digital transformation (Teichert, 2019). Nevertheless, the construct of digital organizational culture – above classified as specific type of organizational culture – remains ambiguous (Gurbaxani and Dunkle, 2019). However, some publications provide first insights into the construct of digital organizational culture. Bolton et al. (2017) showed that unified communications and collaborations have the potential to change the way employees work and communicate. Earley (2014) defines, among other things, a decentralized organizational structure and an accompanying higher degree of agility as a key element in the digital transformation framework. For many, agility is a central element of digital organizational culture (Duerr et al., 2018; Freitas Junior et al., 2017; Hartl and Hess, 2017; Reitz et al., 2018). Also, ambidexterity seems to be an element of digital organizational culture (Dixon et al., 2017; Holotiuk and Beimborn, 2017). Like agility, ambidexterity also aims to meet increasingly complex requirements. Another element to meet the digital transformation could also be working in cross-functional teams (Duerr et al., 2018; Maedche, 2016). Through cross-functional teams, conflicts can be reduced, and it can be ensured that certain functions are aware of what happens in other functions (Duerr et al., 2018). Regarding leadership – which can be defined as an important part of the organizational culture (Schein, 2010) - some trends can also be identified: To meet the new requirements, the literature repeatedly calls for the new role of a Chief Digital Officer (CDO), who could change the style of leadership within an organization (Becker et al., 2018). The role of the CDO and the Chief Information Officer (CIO) in digital transformation is also discussed by Haffke et al. (2016). Agarwal et al. (2011) define characteristics for transformational leaders: They motivate employees to change, provide training, integrate employees as well as novel skills into the organization, adapt new technologies, and provide clear visions. Hesse (2018) outlines what this form of leadership looks like and defines a stronger focus on change management, the lower hierarchical distance between leader and employee, and a more pronounced need for communication as key elements.

In summary, we develop a definition for "digital organizational culture" and thus distinguish it from the fundamental concepts of "digital transformation" and "organizational culture". The subsequent summarized state of research regarding digital organizational culture serves as a basis for the further procedure.

3 Research Methodology

This paper follows a multiple case study design described by Yin (2014). Case study research aims to answer research questions that attempt “to explain some present circumstance” (Yin, 2014, p. 4). Such questions often begin with “how” or “why” – a description that applies to both research questions of this paper. In addition, case study research is suitable for investigating issues that have been less well known up to now. It offers openness to new insights and exploring new research fields (Eisenhardt, 1989). To gain detailed insights into the phenomenon of digital organizational culture, we conducted 16 interviews in seven companies across different industries. All companies can be classified as large companies with more than one thousand employees. *Table 1* provides an overview of our data sample:

Case	Industry	Alias	Number of Interviewees	IPs
A	Chemistry	ChemComp	4	IP01-IP04
B	Media & Publishing	MediaCorp	2	IP05-IP06
C	Mobility & Engineering	MobilCo	2	IP07-IP08
D	Automotive	CarCo1	3	IP09-IP11
E	Pharmacy	PharmaComp	2	IP12-IP13
F	Consulting	ConsultO	1	IP14
G	Automotive	CarCo2	2	IP15-IP16

Table 1: Overview of cases and interviews

Interview partners (IP) were selected based on two factors. First, all interviewees had worked in the respective organization for at least three years. This ensured that “the way things are done around here” was familiar to the IP. Second, care was taken to interview employees who were aware of cultural developments and/or digital transformation due to their position. Since organizational culture is perceived subjectively in some facets, an attempt was made to interview employees in different functions within the cases. Including different perspectives helped outline a holistic picture of the organizational culture. Based on these criteria, employees in organizational development, change management, agile coaching, digital innovation management, IS analysts, and HR business partnering were interviewed.

The interviews were conducted between January and March 2021 in a semi-structured way. The interview guideline consisted mostly of open-ended questions to allow the IP to share openly and without bias about current culture, desired culture, and measures to establish a digital organizational culture. Additionally, we asked some closed-ended questions such as “Do you know the values of your company?” or “Has there been a cultural initiative in your company in the recent past?” Questions like those were asked to clarify how distinct cultural awareness is. This form was chosen to create a guided discussion rather than a simple and rigid query of a fixed sequence of questions. Additionally, this type allows for improvisation and exploration of the objects (Runeson and Höst, 2009). The interviews took place almost exclusively via virtual platforms such as Microsoft Teams and were subsequently transcribed by the first author. The transcription was done with the help of the software “MaxQDA Plus 2020”. To analyze the data, a qualitative content analysis, according to Mayring (2015), was carried out, which was divided into two steps based on our research questions. First, a deductive-inductive approach was taken to understand the construct of digital organizational culture along the dimensions of artifacts, values and beliefs, and underlying assumptions. For this purpose, we built on findings regarding digital organizational culture in extant literature (Duerr et al., 2018; Hartl and Hess, 2017) to define coding categories. *Table 2* provides an overview of some exemplary coding categories. After coding all the available data in accordance with the deductively identified coding rules, each category was inductively

explored by searching for emerging sub-categories or additional categories. Thus, existing results are iteratively reviewed and extended through the inductive approach.

Category	Coding Rule	Anchoring Example
Willingness to Learn	Statements that show the need for employees to be willing to learn, to be curious, and to develop themselves	“I would say that curiosity is certainly a topic that increasingly plays a role as a value.” (IP02)
Trust	Statements that illustrate the need for trust between different stakeholder groups within the organization	“A culture of trust has also resulted or has been created.” (IP04)
Autonomy	Statements that employee empowerment is promoted so that they can act proactively and autonomously	“I perceive, in some areas, that employees or teams can act more autonomously. Have more freedom.” (IP03)
Communication	Statements that foster internal and external communication for knowledge and information sharing	“I would say that this generates an open and transparent exchange. Feedback is also given more often.” (IP14)

Table 2: Exemplary coding categories

Second, due to the dearth of research on achieving digital organizational culture, a purely inductive approach was conducted to address our second research question - How can organizations establish an effective digital organizational culture? The entire data set was analyzed again by following the recommendations for inductive analysis by Mayring (2015), which allows uncovering hidden themes and patterns within the data by avoiding the *a priori* definition of deductive coding categories. Two key topics emerged during the inductive analysis: (1) *Fundamental challenges regarding cultural change* and (2) *Initiatives to enable cultural change*. In the following, we present our insights into what constitutes an effective digital organizational culture (RQ1) before presenting insights on how to establish an effective digital organizational culture (RQ2).

4 Findings

4.1 What Constitutes Digital Organizational Culture

To understand how digital organizational culture becomes embedded in organizations, it is necessary to describe the concept of digital organizational culture in more detail. Previous studies provide initial approaches but do not provide a holistic and uniform construct.

Artifacts: All IPs agreed that a *hybrid form of virtual and physical collaboration* will be established in the future: “We know that this remote working works. [...] This percentage will increase, and it will become more natural. But there will also be no 100%, there will be a hybrid” (IP03). The extent to which collaboration is composed of virtual and physical share could depend primarily on three variables: (1) *Team Composition*: The proportion of physical and virtual collaboration will depend on the extent to which teams that collaborate and communicate directly and regularly are based on one location or more. (2) *Type of Work*: Based on the premise – which admittedly requires further study – that virtual collaboration is associated with a lower level of innovation capability, tasks requiring more creativity might be more likely to occur in a physical context than tasks that require a quieter atmosphere. (3) *Individual Preferences*: To increase autonomy and flexibility, employees can decide independently how the proportion of virtual and physical collaboration is composed within the team. Even though many IPs state that most of the company’s offices are still rather classic in style, some others give insights about *open and flexible working space*. Three elements can be identified which should shape the working spaces in times of digital transformation: (1) *Openness and transparency*, (2) *High level of flexibility*, (3) *Space for interaction and networking*. Companies establish *internal virtual platforms* that go beyond pure communication. Virtual learning platforms were identified in three cases – *ChemComp*, *PharmaComp* and *CarCo2*. These aim to provide employees with development opportunities independent of time and location. In four cases, it became clear that *cross-functional teams* will be increasingly used in the

future, which means that teams are put together for shorter periods, depending on the competencies needed. In this way, those competencies and strengths of the employees can be brought together that are necessary: “You need completely different competencies. And I think that is the vision, that [...] really derived temporary teams are formed, which take care of this task” (IP09). In some of the cases, it became clear that companies have implemented measures designed to **break down of structural silos** within the company or to bring all parts of the company closer together. This artifact was formulated based on two more frequent activities: (1) *Merging several units* and (2) *Introducing a collective bonus system*.

Values & Beliefs: Twelve IPs, spread across all seven companies, see the need for **openness towards change**. The fact that this value is becoming even more important in times of digital transformation seems hardly surprising: “Then came the next change, then came the next stage, something was changed again, something was improved again. I believe that [...] we will lose the phase of constancy – I think we will get much more into permanent change than we have done in the past. [...] I don’t think that will give any calming down” (IP02). Nine IPs within six cases mentioned the importance of the company's **innovation capability**. It seems that innovation capability is becoming more important in times of digital transformation, as it is no longer limited exclusively to end products but involves all business units: “This inventive spirit is at the core of our business. What is becoming important and gaining in importance, however, is to apply these ideas to other areas of the business” (IP12). **Communication** will continue to be a fundamental component of a modern and successful organizational culture in the future. During the interviews, two reasons were found why open and transparent communication will continue to gain relevance in times of digital transformation. (1) *Greater complexity requires greater exchange* and (2) *Increasing importance of human networks*. Seven of the IPs state that employees’ **willingness to learn** will become more important in the future. Some of them specifically mention employee curiosity (IP01; IP02; IP09; IP14) as a necessary competency to meet emerging demands. “Well, I would say that the topic of “curiosity” is certainly one that increasingly still plays a role as a value” (IP02). IP07 uses the term more broadly and speaks of “permanent learning” and a “journey of continuous development”. There was a clear need to establish a **tolerance towards failure** within the cases interviewed, which was considered relevant by 14 IPs across all companies. The IPs agree that mistakes cannot be avoided. Especially in times that are characterized by change, in which openness to such changes is demanded, mistakes always occur: “Especially when many things are newly developing, newly emerging, and when you do one thing or another for the first time – then you make mistakes” (IP04). Since this aspect was widely discussed in the interviews, five clear elements of dealing with failure are: (1) *Encourage experimentation*, (2) *Recognize and admit failure quickly*, (3) *Provide fast solutions*, (4) *Open communication of failure*, and (5) *Learn from failure*. A central characteristic brought into the professional world by digital transformation is **speed**. Both companies and employees must adjust to this unprecedented speed. There are several ways to establish speed in the way employees work. During data collection, two aspects were found: (1) *Less relevance of perfection* and (2) *Risk affinity*. Another element that fosters speed but needs to be mentioned as a separate component of digital organizational culture is the value of **autonomy**. In total, eleven IPs within five of the interviewed companies stated that employees must have greater freedom to try things out independently and make decisions directly – across hierarchies. During the interviews, four reasons could be elaborated why autonomy is becoming even more important in times of digital transformation: (1) *Better response to complexity*, (2) *Foster speed*, (3) *Higher degree of self-realization*, and (4) *Foster entrepreneurship*. Another value of digital organizational culture is **trust**. This value was discussed in the context of four cases. When new forms of collaboration are being established, when collaboration is more interconnected and interwoven than ever before, and when employees are given a greater degree of responsibility and autonomy, the value of trust also takes on greater significance. When talking about digital transformation, it is obvious that employees need to bring a level of **digital skills** to deal with new tools or automated processes. IP06 sums up: “If I replace processes, by using technology, of course, I have to be able to deal with the technology.” However, digital skills do not seem to be the focus of the culture. IP13 describes them as a “minimum requirement at a certain level”. Another aspect when talking about digital skills seems to be the large amount of data and information that employees must deal with. For IP08, this large amount of data leads to two challenges: First, the need to filter the relevant data and, secondly,

the need to verify the information in terms of reliability and truth. This approach is supported by IP06, which calls this a “core competency” (IP06). Furthermore, a strong shift toward a **start-up mentality** is mentioned, which comprises: (1) *Low level of formality* and (2) *Cross-hierarchical collaboration*.

Basic Assumptions: Based on the artifacts and the values and beliefs, it was possible to define four basic assumptions within the interviews that represent the core of digital organizational culture. (1) Artifacts such as cross-functional teams and values such as openness, speed, tolerance towards failure, and start-up mentality assume that organizations face the **necessity for increased agility**. Some of the IPs support this: “You need agility to be able to introduce and drive digitalization at all. Because I think it’s so complex and the whole issue is so multi-layered – you won’t be able to manage it with one big master plan.” (2) It was shown that organizations aim for more open and transparent communication and higher autonomy and trust. Those values clarify that there is a **need for a new understanding of leadership**. This new understanding of leadership includes the central element that leaders need to empower employees by handing over power to individual employees or teams. Instead of dictating step-by-step instructions, a clear goal or overarching vision is provided. (3) When talking about digital transformation, it is not surprising that organizations seek **greater awareness of digital technologies to maximize new emerging possibilities**. This basic assumption is supported through values such as openness towards change, willingness to learn, and digital skills. (4) It was clearly shown that digital transformation is a huge, complex, and multi-layered challenge for organizations. To face this challenge faster knowledge management is necessary. Values such as communication, speed, and openness underline the **need for intensified operating in open and transparent networks**. In conclusion, digital organizational culture encompasses the following elements:

	Elements of digital organizational culture	Mentioned by IP
Artifacts	Hybrid Form of Virtual and Physical Collaboration	IP01-IP16
	Open and Flexible Working Space	IP01; IP03; IP04; IP07; IP12; IP13-IP15
	Internal Virtual Platforms	IP01; IP03; IP04; IP13; IP16
	Cross-Functional Teams	IP06; IP07; IP09; IP10; IP12; IP13
	Break Down of Structural Silos	IP01-IP03; IP05- IP07; IP09; IP10; IP12- IP14
Values & Beliefs	Openness Towards Change	IP01- IP05; IP07; IP09; IP11; IP12; IP14-IP16
	Innovation Capability	IP01; IP06; IP09; IP11-IP16
	Communication	IP01- IP04; IP06; IP08; IP09; IP13- IP16
	Willingness to Learn	IP01-IP03; IP07; IP09; IP14; IP15
	Tolerance Towards Failure	IP01- IP09; IP11- IP14; IP16
	Speed	IP01-IP05; IP07; IP09; IP11; IP12
	Autonomy	IP01; IP03; IP04; IP07; IP09; IP10-IP13; IP15
	Trust	IP01-IP05; IP07; IP11
	Digital Skills	IP01; IP06; IP08; IP11; IP13; IP14
	Start-Up Mentality	IP01-IP08; IP12; IP14-IP16
Basic Assumptions	Increased Necessity for Agility	IP03-IP07; IP09-IP14; IP16
	New Understanding of Leadership	IP01; IP02; IP04; IP06; IP07; IP09; IP10; IP13-IP15
	Greater Awareness for Digital Technologies to Maximize New Capabilities	IP01-IP04; IP06; IP07; IP09; IP10; IP12; IP13; IP15
	Need for Intensified Operating in Open & Transparent Networks	IP01-IP04; IP08; IP09; IP10; IP14; IP16

Table 3: Elements of digital organizational culture

4.2 How to Establish a Digital Organizational Culture

Based on these insights, we now focus on how to establish such an effective digital organizational culture within an organization. Our IPs highlight different perspectives on how to establish a digital organizational culture, which seem paradoxical at first glance: On the one hand, cultural change was described as overly complex, creating fundamental challenges, which cannot be managed with classic change projects, or how IP07 put it: “There is no possibility to change culture by program”. On the other hand, there was a strong focus on concrete change measures initiated by the companies to change the culture - so-called “cultural initiatives”. In the following, we first address the fundamental challenges regarding cultural change before moving on to the specific initiatives to establish a digital organizational culture.

Fundamental challenges regarding cultural change

There are three challenges which demonstrate how cultural change differs from classic change projects: (1) *People behave according to the system*. IP03 counts structures and processes among this system: “Employees behave according to certain behavioral structures within a system. Usually, the system leads to any behavioral patterns being acquired step by step.” Based on this logic, the system must be adapted to be able to change the culture in the following step. IP06 summarizes this assumption with a metaphor: “That means we want to observe culture because we are convinced that culture is always only the shadow of the current conditions. You cannot change the shadow. You have to change the current conditions.” (2) *Cultural change is omnipresent*: The IPs name numerous measures and activities in which the desired culture is to be communicated and exemplified. These measures are not limited to specific organizational units. For example, IP13 highlights the evaluation interviews, in which the corporate values are discussed at *PharmaComp* to get closer to the target state. At *ChemComp* the incentive system was adjusted as part of the cultural initiative from an individual-based incentive system to a company-wide incentive system. IP07 goes a step further and sees cultural change as omnipresent: “Every activity, every project, every strategic decision for a new business, for new customer markets has to do with cultural change.” The difference to classic change projects is, therefore, that cultural change is not limited to individual departments or processes, but is omnipresent. (3) *Cultural change is perceived eternally*: Cultural development has its own dynamics. Especially in large companies - like the ones we studied - the culture is constantly changing on its own, and without any specific initiatives, in a direction unknown to the company.

Initiatives to establish a digital organizational culture

We found that some companies have recently implemented cultural initiatives to change culture consciously and to address the challenges defined above. In three cases (*ChemComp*, *CarCo1* and *CarCo2*), we spoke with employees who worked with cultural development on a daily basis. In these cases, it was possible to talk about the procedure in the context of the initiatives. As part of the data analysis, we realized that these initiatives can be divided into three categories: (1) *Trigger*, (2) *Direction* and (3) *Measures*. Within those categories six sub-categories can be defined which allowed a more precise subdivision: Table 4 provides an overview of the three categories and the six sub-categories:

	<i>ChemComp</i>	<i>CarCo1</i>	<i>CarCo2</i>
Trigger	Analysis of the current state of organizational culture		
	Analysis of actual culture revealed low-performance orientation and lack of dynamic (IP03; IP04) Personnel change in the board of directors (IP01)	Employees' desire for more empowerment (IP10)	Analysis of actual culture revealed low innovation capability and strong hierarchical thinking (IP15) Growth and increasing internationalization of the company (IP16)
Direction	Definition of the target state and concrete measures through a top-down and bottom-up approach		
	Bottom-up survey to determine the current situation (IP03) Top-down communication of new organizational values (IP01; IP03) Bottom-up approach: development of proposals from employees to achieve two values (IP01)	Top-down communication of the need for cultural change (IP10) Bottom-up approach by leaders and employees to define necessary measures and concretize cultural target state (IP10)	Bottom-up survey to determine the current situation (IP15) Top-down communication on various channels (IP15)
Measures	Communication of new cultural elements		
	Establishment and communication of new values	Establishment and communication of new principles	Establishment and communication of new values
	Structural changes to adapt the system		
	Conversion of individual bonus system to a collective-based approach (IP01) Merging different business units to break down structural silos (IP01)	Conversion of the individual bonus system to a collective-based bonus system (IP10) Establishment of digital tools such as feedback apps (IP10)	Integration of values and behavioral anchors in trainings (IP15)
	Sensitize leaders to exemplify values		
	Coach leaders to establish behaviors that map to values (IP03)	Highlight the relevance of leadership during cultural change (IP09)	Make leaders aware that they act as role models (IP16)
	Considering restraining forces		
Independent initiatives in individual segments (IP01) Impatience and resistance within the organization (IP03)	Employees who stick to habits and the old ways of doing things (IP09; IP10)	Need for higher awareness of culture (IP15)	

Table 4: Comparison of cultural initiatives

(1) Analysis of the current state of the organizational culture: In both *ChemComp* and *CarCo2*, an analysis of the current state of the culture was conducted before any change in the culture was intended. In both cases mentioned, this was done by a bottom-up survey of the employees. In both companies, this process was supported by an external consultant (IP03; IP15). IP14 – working as a consultant at *ConsultO* – supports the fact that the culture is analyzed before it is consciously changed. IP14 emphasizes above all that different perspectives must be taken to get a holistic image. **(2) Definition of the target state as well as concrete measures through top-down and bottom-up approach:** It is striking that there was both a top-down and a bottom-up stream in the cultural initiatives examined. The implementation of the two different directions was handled differently. On the one hand, the bottom-up approach could already be found in the analysis of the current status. *ChemComp* and *CarCo2* conducted

an employee survey to define this. Further measures included, for example, the development of proposals of concrete measures for the implementation of individual values by employees. In defining the target culture, *CarCo1* relied on employees and leaders who could apply for this interdisciplinary activity. On the other hand, the top-down stream was manifested in the initiation of the culture initiative as well as in the definition and communication of the new values. The combination of a top-down approach as well as a bottom-up approach is necessary to respond to employees, involve their perspective on things and exemplify the new target culture. In defining the new target culture, it also became clear that the companies examined, defined values or principles that clarified the core of the culture. This was the case at *ChemComp* (IP02) and at *CarCo2* (IP15). At *CarCo1* (IP10) for example, leadership criteria were defined and at *PharmaComp* (IP13) for example, principles were defined that pursue the same aim – namely, to summarize the target culture and provide behavioral anchors. **(3) Communication of new cultural elements:** The companies communicated the new target culture through various channels to create cultural awareness. Communication ranged from internal platforms and magazines to communication at employee events. In addition, leaders were trained in seminars to communicate the new cultural elements to their employees as part of the top-down stream. **(4) Structural changes to adapt the system:** It has already been established in the previous section that structural changes must also be made when cultural change takes place. To ensure a common definition at this point: IP03 (46) speaks of an adaptation of the system. IP06 calls for cultural change to be incorporated into “structures.” IP07 chooses the term “a systematic further development of the framework”. However, they aim to ensure that structures and processes are aligned with the target culture. The most common change identified in four companies (*ChemComp*, *MediaCorp*, *MobilCo* & *CarCo1*) was a shift in the incentive system from an individual performance appraisal to a link to collective KPIs. This change aimed to promote open and transparent collaboration to operate less in silos and promotes the basic assumption of operating in open and transparent networks. IP06 outlines the connection: “For example, this is also a structural effect that we hope will have a great effect on a cultural level.” **(5) Sensitize leaders to exemplify values:** Within the same companies – *ChemComp*, *CarCo1* and *CarCo2* – IPs addressed the specific role of leaders that becomes necessary to move closer to the target culture: “A leader is much of a role model. How I do things.” (IP16). In *ChemComp* and *CarCo1*, the leaders were taught about the new target culture in training sessions and then communicated it to the individual teams. “Culture is essentially shaped by example.” (IP04). IP03 supports this approach by emphasizing the need for leaders to seek out and promote discourse in the spirit of the new culture. However, he qualifies the special role by adding: “But there, too, you have to see that the leaders are also part of a system” (IP03). **(6) Considering restraining forces:** We found that companies experienced restraining forces in changing their culture. These were varied and ranged from a lack of cultural awareness to a lack of willingness to change among employees. In addition, it became clear that cultural change itself was particularly challenging due to the magnitude of change. Companies should therefore identify and specifically address the restraining forces.

Those findings within the cultural initiatives seem to match the defined elements of digital organizational culture above: There should be a top-down approach to ensure communication of a clear vision. A bottom-up approach should empower employees to contribute their ideas and encourage their autonomy. All employees should be involved to take advantage of an organization’s diversity and generate a higher level of innovation. Measures should be cross-hierarchical and company-wide to foster start-up mentality and cross-functional collaboration. Role models should be found to identify with the values and exemplify them. Systemic and structural changes should be made to promote the values consciously. A fundamental awareness of culture and its constant and continuous development should be created to strengthen willingness to learn and openness to change. It should be communicated why a new culture is necessary to establish trust in the changes.

The combination of the elements of digital organizational culture defined above and the findings from the culture initiatives imply that cultural initiatives must already contain and convey the spirit of the new culture. Every activity consistent with the cultural elements defined above changes the culture towards the target state. According to IP07, all measures and changes impact culture: “All these things [...] are culture-shaping elements.” Obviously, this also applies to the measures within the cultural initiatives per se.

5 Discussion

Wessel et al. (2021) demonstrate that digital transformation is not limited to technical changes but also encompasses changes for the entire organization. To uncover what an effective digital organizational culture should look like and how organizations can establish this culture, we put forward the following research questions:

(RQ1) What constitutes an effective digital organizational culture that enables digital transformation?

(RQ2) How can organizations establish an effective digital organizational culture?

Regarding *(RQ1)* we have identified key elements of digital organizational culture, which support insights from extant research: Digital organizational culture is characterized by four basic assumptions: First, a high degree of agility in individual teams as well as in the entire organization to adapt quickly to the rapidly changing circumstances of the environment and to establish an openness towards change. Second, the affinity for digital technologies to maximize the opportunities that arise in the context of digital transformation. Third, employees need to operate internally and externally in distinctive networks characterized by open and transparent communication to achieve a high degree of speed in the exchange of knowledge and information. Fourth, a new understanding of leadership is embedded in the core of the culture. Leaders are no longer characterized by hierarchical levels. Rather, leaders act as coaches and consultants to empower teams and employees to act autonomously. Leadership is thus more distributed and better aligned with the strengths of individuals. In this way, organizations act in a way that is better attuned to the new speed and complexity emerging: since decision-making power now is within autonomous teams, decision-making and coordination paths become shorter. Since employees or teams with the highest expertise and with the power of heterogeneous teams make the decisions, the increasingly complex issues are also better addressed. The four basic assumptions are surrounded by ten values and five artifacts, all of which fall into at least one of the four categories of basic assumptions.

To link our results to some previous exemplary studies: Duerr et al. (2018) and Leonhardt et al. (2017) defined the need for a higher level of agility within the organization. We confirm some of the identified values of Hartl and Hess (2017), such as “Openness towards change”, “Tolerance towards failure”, “Communication” and “Trust”. However, we identified one key element contradictory to the existing studies and therefore requires attention: Earley (2014) states that organizations implement a decentralized structure to foster agility. In contrast, our results indicate that organizations created a shift towards a more centralized structure. This does not conflict with a higher degree of agility: The intention behind this change was to promote collaboration within the organization and ensure a closer connection. To the authors' knowledge, digital organizational culture has been studied twice in IS as a holistic construct. Duerr et al. (2018) used exploratory case studies to examine characteristics of digital organizational cultures categorized on the levels of Schein's model and Hartl and Hess (2017) digital organizational culture values based on exploratory Delphi study. We confirm some key elements and extend their constructs by adding values such as "speed" and "autonomy" and the basic assumption that knowledge needs to be better networked within and outside organizations and made openly and transparently accessible.

(RQ2) Extant literature has not yet investigated how organizations can establish a digital organizational culture. We found three fundamental challenges regarding the cultural change that demonstrate the difficulty of changing culture: (1) people behave according to the system, (2) cultural change is omnipresent, (3) cultural change is perceived to be never-finished. Therefore, cultural change implies a high degree of complexity. We observed three cultural initiatives in more detail and found six commonalities between those initiatives (see Table 4). Those commonalities can be seen as a guideline for organizations when changing organizational culture. First, an analysis of the current state of the culture should be implemented to identify key elements of culture and elements with the highest potential for improvement. Second, a top-down and a bottom-up approach should be combined to define the target state and concrete measures to achieve this target state. Third, organizations should communicate new cultural elements through various channels. Fourth, structural changes need to be implemented to adapt the system concerning the new culture. Fifth, leaders need to be sensitized to exemplify the new values. Sixth, organizations should identify restraining forces concerning particular changes.

The three challenges demonstrate the high complexity associated with cultural change, which leads to the assumption that cultural change should be divided into single steps. *Figure 1* visualizes this process and thus provides the basis of the cultural change to achieve digital organizational culture.

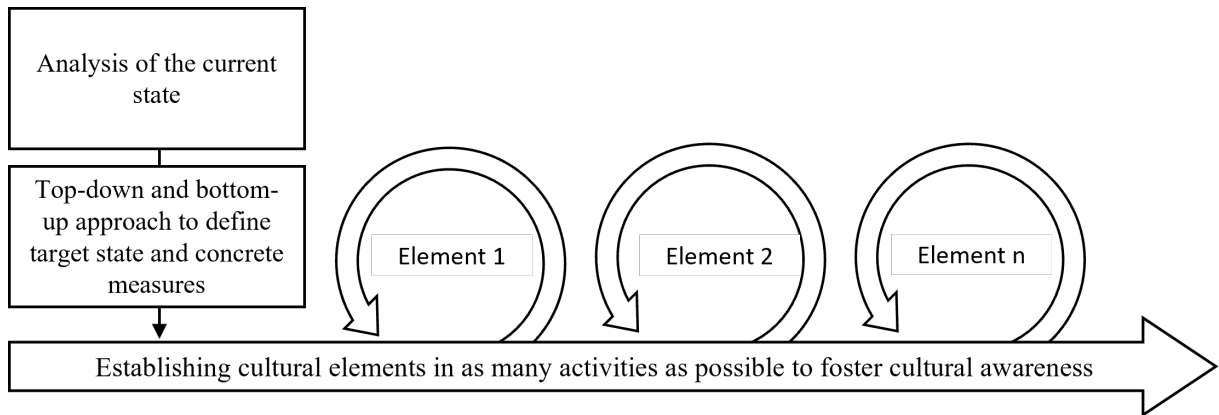


Figure 1: Cultural change in times of digital transformation

The iterative process illustrates that culture changes continuously and the huge scope of cultural change. Due to this huge scope of cultural change individual elements are not implemented all at once within the organization but gradually. The elements within the iterative cycles therefore refer to the cultural elements that make up the digital organizational culture. We have defined these elements with respect to the first research question in Table 3 and therefore include the artifacts, the values, and the fundamental assumptions of the digital organizational culture. Since cultural change is omnipresent, it seems necessary that the measures themselves in the context of cultural change also already contain the spirit of the new target culture. A culture characterized by values such as openness towards change, a high innovation capability, and a willingness to learn cannot have a fixed endpoint – rather, it remains continuously changing and developing. A closer look at *Figure 1* reveals that this already contains the first two steps defined in the framework of the commonalities of the cultural initiatives studied: The analysis of the current state and the definition of the target culture and concrete measures in a combination of a top-down and a bottom-up approach. The four remaining measures are expressed in implementing the individual cultural elements, which are illustrated by the cycles within *Figure 1*. To go one step further, *Figure 2* shows how those individual cycles are composed.

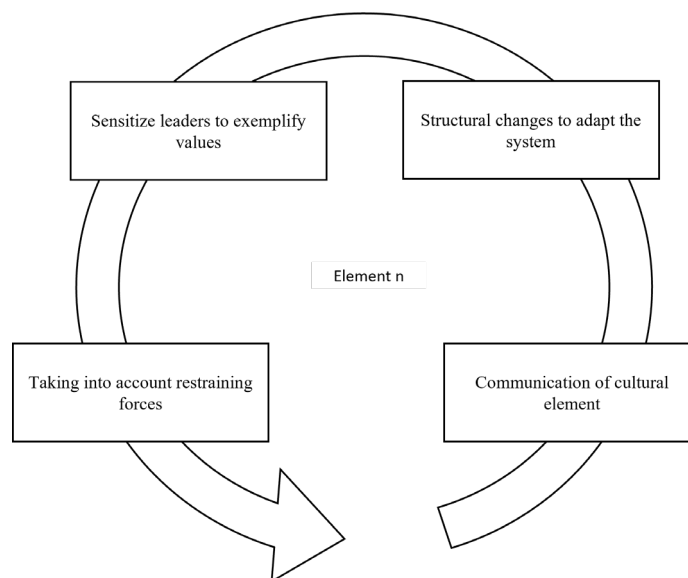


Figure 2: Measures for implementing digital organizational culture

The combination of both figures provides companies with a guideline on carrying out cultural changes. Our analysis shows that even though the three identified fundamental challenges show that cultural change cannot be seen as a classic change project, targeted change measures can help ensure cultural awareness among employees. IP03 summarizes this final thought, which combines the identified challenges with the identified measures: “Our cultural elements describe a target state, perhaps even an ideal state. We will probably never achieve this in its entirety, but our cultural initiative ensures that we constantly align ourselves with these elements - like a compass.”

6 Limitations and Conclusion

As with any research, some limitations must be considered: First, only a few interviews could be conducted in some cases. Since digital organizational culture initiatives are a complex, multi-layered – partly also subjectively perceived – construct, we aimed to interview particularly knowledgeable people with an overview of developments in the entire organization. Second, even though our data set comprises 16 interviews in seven different companies, these do not cover all industries. Future research might verify and contextualize our insights across other industrial settings. Lastly, due to the exploratory nature of our research, we relied exclusively on interview data. Based on our findings, future research might collect different types of data to triangulate and extend our findings.

Based on these limitations, there are opportunities for further research: First, additional industries should be included to give the outlined picture of digital organizational culture even more validity. In this way, differences and similarities can be worked out to establish a universal construct. Second, this paper exclusively examined companies with over one thousand employees and focused on large or very large companies. Research in medium-sized and small companies is necessary to verify the applicability of our findings in different settings. These companies face different challenges from digital transformation than large companies and probably need different cultural elements. Third, the achievement of the elaborated digital organizational culture offers scope for future research. To the author’s knowledge, the elaborated model is the first that answers the question of *how* to achieve a digital organizational culture. Therefore, it would be interesting to see if other researchers come to a similar conclusion to validate the elaborated findings. The structural changes to the system, which offer companies an initial lever to change the culture in the long term, should be expanded. Finally, we identified specific measures to promote cultural change and build a digital organizational culture. Future research could investigate how specific measures affect different aspects of digital organizational culture or in which phase of the process which measures are particularly important.

To conclude, this paper addresses what a digital organizational culture is and how it can be established by conducting a multiple case study. The results allow us to make three key contributions: First, we corroborate insights about the nature of digital organizational culture and develop a definition of digital organizational culture. Second, we uncover four basic assumptions, ten values, and five artifacts related to digital organizational culture. Third, we open the black box of establishing a digital organizational culture. Therefore, we have defined six elements that characterize an iterative process and serve as a guideline for companies on their way to digital organizational culture.

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