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Digital Organizational Culture: Contributions to a Definition and Future Challenges

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Abstract

Digitalization is unstoppable and takes place in all domains of human life. One of the areas in which this digitalization has profound implications is organizations, understood as coordinated collective units open to the external environment and that are based on and justified by the fulfillment of purposes that would not otherwise be fulfilled, and that have an organizational culture as, generically, forms of thinking, feeling and acting that are characteristics of each specific organization. Through a focused look on contributions to the definition of the concept of digitalization and future challenges, this paper analyzes and discusses the shaping of the digital component in organizational culture, which materializes in a digital organizational culture. To fulfill this aim, a document search of papers was carried out in two comprehensive databases that focus on this topic that served as the basis for our argument. Digital organizational culture, as a product and a process, is shaped by indeterminacy and uncertainty, in an environment permeated by digital technology. However, it is already a reality that new technologies permeate all spheres of organizations and, therefore, organizations need to put in place a well-planned and well-defined strategy for this whole process of digital transition to accomplish this transformation successfully.

Keywords: digital organizational culture, organizational culture, organization, interdisciplinarity, sustainability

1. Introduction

Currently, we undoubtedly live in an increasingly digital society (Serpa, 2021; Karpova & Proskurina, 2021; Serpa & Ferreira, 2020; Al-Zubi, 2021), a process that has been accelerated by the COVID-19 pandemic (Sá, Santos, Serpa, & Miguel Ferreira, 2021; Ferreira & Serpa, 2021). One of the examples of materialization of this (possible) digital society is Society 5.0 (Sá, Santos, Serpa, & Ferreira, 2021; Sá et al., 2021), which, briefly, proposes a deepening of the potential of the individual-technology relationship in promoting the improvement of the quality of citizens' life through a super-smart society – Society 5.0. This concept is a guideline for social development, which can have a profound impact on societies at all levels in terms of quality of life and sustainability (Ferreira & Serpa, 2018).

It is unavoidable that this growing dissemination and influence of digital technology – based on the dematerialization, obtaining, processing and application of huge amounts of information and its contribution to decision-making – influences the organizations themselves: "Digital technology is not only changing how organizations operate but also the way we think about organizing" (Snow, Fjeldstad, & Langer, 2017, p. 5). Therefore, one of the areas in which this digitalization has profound implications is organizations, understood as coordinated collective units open to the external environment and that are based and justified by the fulfillment of purposes that would not otherwise be fulfilled, and that have an organizational culture as, generically, forms of thinking, feeling and acting that are characteristics of each specific organization. As Borcan (2021) claims, "The appropriate organizational culture can be understood as a competitive advantage, as it plays a major role in the adoption of new technologies and innovation process" (p. 108).

The importance of the relationship between organizational culture and information technology/information systems (IT/IS) was highlighted by Llopis, González, and Gascó back in 2004, when the authors sustained that a positive relationship between organizational culture and IT/IS entails several benefits. Among these, the following stand out:

> *It allows us to know whether IT/IS implementation will be satisfactorily accepted [...]. 2. It lays down patterns for information usage [...]. Thus, it helps identify which information is relevant, where it may be obtained and, above all, to whom it must be supplied [...]. 3. It is an important communication medium, both inside and outside the firm [...] and allows us to assess the effectiveness of the IT applied to telecommunications [...]. 4. It creates cohesion among the members of a firm, as it explains "the way things are done in a firm" [...]. 5. It allows the creation of a social control system within a firm. For instance, the implementation of an IS and the correct predisposition of corporate members towards such an IS are hardly controlled merely by means of formal measures. Cultural rules also play a very important role in this respect [...]. 6. It may help increase satisfaction levels among all the internal collaborators of the firm, for it facilitates environmental adaptation and internal integration, thus reducing the anxiety created by the IS/IT (p. 214).*

Presently, the context of digitalization is unstoppable and takes place in all social domains. This paper analyses the shaping of the digital component in organizational culture, which materializes in digital organizational culture, focusing on its definition, contributions and future challenges, as this scientific domain needs further deepening (Zhen, Yousaf, Radulescu, & Yasir, 2021), which justifies the present study. Through a focused look to contributions on the definition of the concept of digitalization and future challenges, this paper analyses and discusses the shaping of the digital component in organizational culture, which materializes in a digital organizational culture. To achieve this purpose, a document search of papers was carried out in two databases (B-ON and SCILIT) that focus on this topic that served as the basis for our argument. Although the literature on organizations provides abundant research on organizational culture, the relationship between organizational culture and digital transformation needs further analysis and discussion, which this paper seeks to deliver.

The paper is structured as follows: next section offers a justification of the material and methods mobilized; afterwards, it discusses directly the digital organizational culture: the digital, the

definition of the (digital) organizational culture concept, and puts forth several theoretical and practical challenges that emerge in this context shaped by digital. The paper closes with the conclusions of this contribution.

2. Material and Methods

The methodology used in the development of this study is qualitative. A literature search was carried out, using, as search terms, digital organizational culture, organization, digital, interdisciplinary, and sustainability, mentioned either in the title or the abstract of books, journal articles and papers in conference proceedings. The search took place between January 17-22, 2022, and the databases searched were (1) B-ON (Biblioteca do Conhecimento Online, online), in Portuguese, which is the database used by the vast majority of higher education institutions in Portugal and enables the search on the Web of Science, DOAJ and Scielo, among other databases or indexers, as well as repositories with documentation, such as doctoral theses and master's dissertations (https://www.b-on.pt/en/what-is-b-on/); and (2) SCILIT (online), which includes all digital objects that have been assigned a DOI (Digital Object Identifier) (https://www.scilit.net/about). This literature search and selection resulted in 37 publications analyzed. Table 1 depicts their characterization. Documents with the following expressions were selected: "digital organizational culture", or "digital organization culture" in the title or the abstract.

Table 1: Results of the document search

	Digital Organizational Culture	**Digital Organization Culture**
SCILIT	1,295	4,770
B-ON	1,193	2,720
TOTAL	2,488	7,490

Source: Authors' production.

Subsequently, each document was read first by the title, rejecting those not written in English, Portuguese, Spanish or French. The abstracts of those that remained were read, having been selected those that seemed interesting. In the following selection step, the remaining ones were read, which narrowed the selection even further. This selection process resulted in 37 documents, characterized in Table 2.

Table 2: Document sources analysed and their characterization

Type of Document		**Geographical Scope**		**Year of Publication**			
Theoretical/ Conceptual	**Empirical**	**International**	**National**	**2021**	**2020**	**2019**	**Prior to 2019**
27	10	28	9	15	7	4	11
Total: 37 publications							

Source: Authors' production.

The treatment and analysis of the collected data were carried out through the content analysis technique (Bardin, 1995), so as to meet the objectives drawn for this research in a comprehensive, rigorous and grounded way (Santos, Ferreira, & Serpa, 2020; Serpa, Ferreira, & Santos, 2020).

3. Digital Organizational Culture

3.1 The digital

Today's society is pervaded with organizations, each of which is seen as:

> *[...] a complex collective unit with a formal dimension and an informal dimension in which there is interaction between (individual and collective) actors with at least a minimum of coordination and reciprocal expectations that employ more or less different roles in the pursuit of goals set internally (not necessarily with the same degree of internal sharing) and generally recognized externally (which are not necessarily the internal goals) influencing and being influenced by the environment, producing for it, over time, characteristics that are both specific and dynamic (Serpa, 2016a, p. 3258).*

These organizations are being deeply affected by digitalization processes, considering social digitalization a process of conversion of information into the digital format and how this conversion and transformation take place. This transformative process influences the configuration and reconfiguration of intergroup and interpersonal relationships, as digitalization cuts across all domains of society (Karpova & Proskurina, 2021, p. 718). Figure 1 depicts the main indicators of social digitalization.

Figure 1: Some indicators of social digitalization
Source: Adapted from Karpova and Proskurina (2021, pp. 718-719).

Savić (2019) very pertinently draws attention to the difference in content between digitization, digitalization, and digital transformation. *Digitization* consists of converting and storing analogic data (paper files) in a digital format; *digitalization* focuses on automating processes and operations, as well as processing information; finally, *digital transformation* consists of creating a completely new business model using digital information and technology (Savić, 2019).

Trenerry et al. (2021) put forth factors associated to and necessary for effective digital transformation within organizations at the individual-, group-, and organizational-level (Figure 2).

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Figure 2: Factors associated to and necessary for effective digital transformation in organizations
Source: Adapted from Trenerry et al. (2021, p. 15).

These three clusters of factors play a relevant role and should be carefully considered in the process of organizations going digital, and their presence or absence may condition its results, the amount of time needed for digital transformation to take place and the quality of its outcomes.

3.2 Organizational Culture

The digital transformation being discussed in this paper also changes the culture of an organization (Savić, 2019; Dudija, 2019). In this context, organizational culture can be seen, according to Serpa (2016b), as "[...] the shared way of being, thinking and acting in a collective of coordinated people with reciprocal expectations; it is shaped, disseminated, learned and changed over time, providing some predictability in every organization" (p. 51).
Schein (2004, 2010), a key author in the field of organizational culture, defines an organization's culture as:

> *[...] a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that 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 (2004, p. 17).*

For Schein (2004, 2010), there are three levels of cultural elements, from the most to the least visible: artefacts, values and basic assumptions as values deemed indisputable truths or certainties of pre-conscious nature that consider fundamental aspects of human life, such as the nature of reality, truth, time, space, human nature, human activity and human relationships that help to understand the previous more visible levels, justifying them (for further development on the concept of organizational culture, different perspectives and ways of apprehension, operationalization and transformation, and corporate culture, see Serpa, 2016b; Isensee, Teuteberg, Griese, & Topi, 2020;

Dauber, Fink, & Yolles, 2012).

Applying this proposal by Schein on digitization processes of organizational culture, Duerr, Holotiuk, Wagner, Beimborn, & Weitzel (2018) present and describe the three levels of organizational culture (Table 4).

Table 4: Levels of organizational culture

Levels	Description	Application to the results
Artefacts	Artefacts deal with organizational attributes that can be observed, felt, and heard as an individual enters a new culture.	Artefacts become manifest in the changing structures of digitalizing firms. These are the facets explicated by practitioners regarding internal and external structure of their firms.
Espoused Beliefs and Values	This level deals with the espoused goals, ideals, norms, standards, and moral principles and is usually the level that can be captured through interviews and questionnaires.	For digitalizing firms, we derived 'digital' goals and norms which have been expressed as vital for a new OC [Organizational Culture]. These values are concentrating around the mentality and authority modes towards digitalization.
Underlying Assumptions	This level deals with phenomena that remain unexplained when insiders are asked about the values of the OC. Information is gathered by observing behaviour carefully to gather underlying assumptions because they are often taken for granted and not recognized.	Firms operating in the digital age are driven by central tenets about digital innovations that are recurrently addressed in stories and business reports within the cases. Abstracting these stories allowed us to derive four central assumptions.

Source: Adapted from Duerr et al. (2018, p. 5128).

The digitalization process tends to increase the pressure and the need for organizations to innovate their culture (Zhen et al., 2021). This phenomenon was analysed by Kiefer, Van Dinther, and Spitzmüller (2021), who, from their analysis, concluded that nine features of organizational culture promote digital innovations: "[...] corporate entrepreneurship, digital awareness and necessity of innovations, digital skills and resources, ecosystem orientation, employee participation, agility and organizational structures, error culture and risk-taking, internal knowledge sharing and collaboration, customer and market orientation as well as open mindedness and willingness to learn" (p. 1).

This process of organizational culture transformation encompassing digital changes raises profound challenges and generates uncertainties (Prakasa, Raharjo, & Wiratama, 2020), which are addressed in the next section.

3.3 Challenges

Managers, with greater or lesser intensity, are aware of the need to follow and, if possible, even anticipate digitalization processes in their organization (Davison & Ou, 2017), and, therefore, leadership is a critical element in the establishment of digital organizational culture (Prakasa et al., 2020). However, sometimes top managers themselves are obstacles, by taking a stance of fear towards digital innovation and change and maintaining the *status quo* (Savić, 2019). Moreover, the potential influence of the outside of the organization and even of the national culture on the organizational culture, whether in its establishment, consolidation, and transformation, should not be forgotten (Ansah & Louw, 2019).

Furthermore, formal leadership is not enough for the establishment of digital organizational culture (Davison & Ou, 2017). It is important to take into account what Laaser and Karlsson (2021) name "subjective autonomy", which derives from informal collectives and can be defined as:

[...] informal worker relations and practices at work that are driven by bottom-up norms and values that aim to establish and defend a sphere of autonomy and independent meaning systems from the formal organization and its demands (Laaser & Karlsson, 2021, p. 7).

It is critical to consider features such as digital expertise and competence, as well as digital leadership, in the process of training and transformation towards digital organizational culture, collaborating to understand the organization's digital transformation goals and training (Duerr et al., 2018; Eschenfelder et al., 2019). Digital competences of both leadership and employees are then crucial to the survival and success of many organizations, and the digitization of processes has impacts on the workforce that need to be taken into account (Villumsen et al., 2021) (Figure 3).
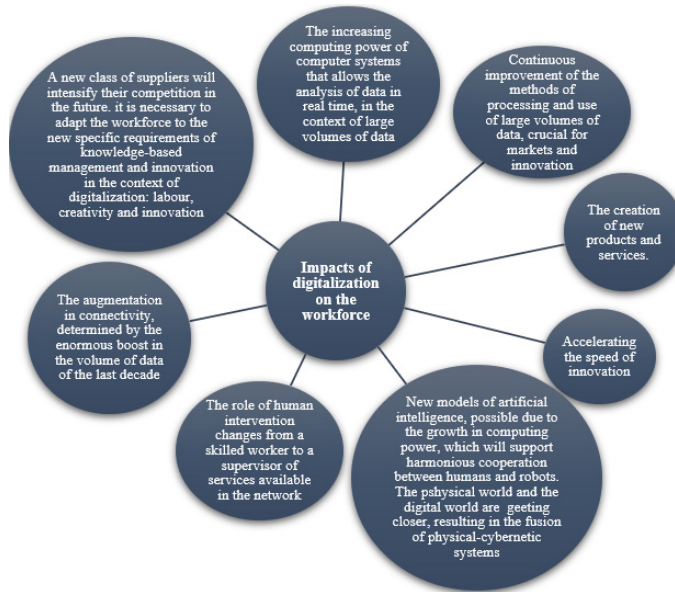
Figure 3: Some impacts of digitalization on the workforce
Source: Adapted from Androniceanu, Georgescu, Tvaronavičienė, and Androniceanu (2020, pp. 4-5).

In this context, digital literacy, as access, consumption and production of digital goods and services (Santos & Serpa, 2017; Serpa & Ferreira, 2020; Sá et al., 2021), is seen as a key source of opportunities and needs for organizational innovation (Davison & Ou, 2017; Chernyavskaya, Polonkoeva, Diuzheva, Mukhambetova, & Tokayeva, 2021).

The "digitalization" of organizational culture change faces several obstacles, including those mentioned by Eschenfelder et al. (2019): information, organization, personnel, marketing, education, technology, and investment and finance. Chernyavskaya et al. (2021) also warn about the possible losses organizations may suffer during the digital transformation implementation process, detailed in Table 5.

Table 5: Possible losses that organizations can incur during the implementation of digital transformation

1	Insufficient information about the digitalization of business systems, its inaccuracy or misinterpretation, leading to confidence level reduction in digital changes and inadequate management decisions.
2	An avalanche-like inflow of information, leading to the cost of its processing increase.
3	Negative perception of the ongoing changes, leading to active resistance of the organization personnel and low employee motivation in the implementation of the digital transformation strategy.

4	Fragmentation of digital changes arising from the lack of a systematic perception of the digital transformation strategy, leading to the build-up of digital competencies among a narrow group of employees of the organization, which entails a failure in the process of a digital value chain development within the business system.
5	Forecasting errors arising from the lack of understanding concerning the consistency of digital transformations in the organization.
6	Technical failures and the failures of technologies and equipment caused by an insufficient technical level for digitalization implementation.

Source: Adapted from Chernyavskaya et al. (2021, p. 3946).

To overcome these obstacles and potential losses of the transition to digitalization in the context of the information economy, organizations should develop a comprehensive organizational culture that promotes "[...] a symbiosis and constant interconnection of influencing factors, constituent elements, digital competencies and skills, and information technologies" (Trushkina, Abazov, Rynkevych, & Bakhautdinova, 2020, p. 27) (Figure 4).
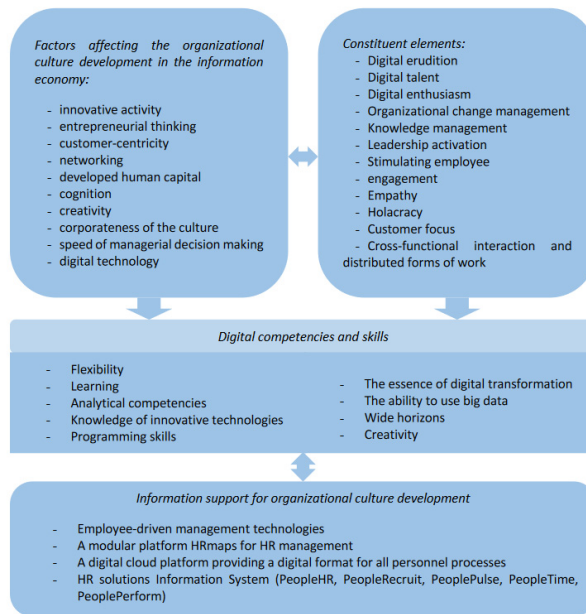
Figure 4: A comprehensive approach to the digital transformation of enterprises' organizational culture in the information economy
Source: Trushkina et al. (2020, p. 27).

Thus, organizations, whatever their nature, need to define a clear and strong strategy that guides them towards digital transformation. This includes, among other elements, ensuring that their members have the necessary and appropriate digital skills, that the organizational culture is receptive and supportive of digital transformation, and that the leadership is strongly committed to this change (Chernyavskaya et al., 2021). Only with this state of mind will it be possible for organizations to succeed in adopting and embracing digital transformation.

Digital organizational culture is characterized by a set of specific features, shown in Table 6, which include the full acceptance of innovation, the ability to work together, the ability to quickly process large volumes of data and information, the competence to work in complex environments,

and the ability to take risks.

Table 6: Some specific features of digital organizational culture

1	The possibility of joint work of both the company personnel and the organization clients, as well as the rapid exchange of information in the process of such economic interaction
2	The ability to process quickly large amounts of digital information in short periods of time, which makes it easier to delegate authority and reduce the degree of bureaucracy in a company
3	Orientation to short-term planning and operational activities of the organization by reducing the time for information processing and management work complexity
4	Focus on overcoming the fear of risky activity conduct by supporting staff activities related to digital innovation

Source: Adapted from Chernyavskaya et al. (2021, p. 3947).

This transformation, involving the participation of organizational members and the implementation of interdisciplinary perspectives (Davison & Ou, 2017), is paramount for organizations to meet the expectations of establishing a "sustainable digitalization culture" (Isensee et al., 2020, p. 13). In short, and borrowing Borcan's (2021) words, "The type of culture adequate for digital transformation is open, flexible and agile" (p. 115).

In their recent study, Imran, Shahzad, Butt, and Kantola (2021) identified leadership, structure, and culture as the most relevant factors for digital transformation in industrial organizations. Based on these three enablers, the authors put forth the propositions of digital transformation in organizations depicted in Table 7.

Table 7: Digital Transformation of Industrial Organizations

Proposition 1	Developing identified leadership competencies facilitates the digital transformation of industrial organizations and enables them to be more agile, customer-centric, and collaborative.
Proposition 2	Flexible organizational structures (decentralization, less formalization, internal and external integration) drive the digital transformation of industrial organizations and enable them to achieve performance outcomes (agility, customer-centricity and collaboration).
Proposition 3	Cultural aspects of values, assumptions, and artefacts underpin digital transformation to achieve performance outcomes (agility, customer centricity and collaboration) in industrial organizations

Source: Adapted from Imran et al. (2021).

Throughout the process of digital transformation in organizations, the three concepts (leadership, structure, and culture) imbricate, resulting in their enhancement and the enhancement of the digital transformation process itself.

4. Conclusion

The purpose of this paper was to analyse and discuss how the digital component is shaped in organizational culture.

Digital organizational culture, as a product and a process, is shaped by indeterminacy and uncertainty, in an environment permeated by digital technology (Zhen et al., 2021). However, it is already a reality that new technologies permeate all spheres of organizations and, therefore, it is pivotal that all their elements have digital literacy to move around easily in an environment characterized by high complexity (Davison & Ou, 2017).

This is a revolution underway within organizations. The current social and organizational dynamics point towards a scenario in which institutional actors master digital technologies and exert

pressure, together with their own social, economic and cultural development, for their organizations to operate in a digital environment, given that only in this way they can grow and develop. A well-planned and well-defined strategy for this whole process of digital transition is the safest and wisest way to successfully accomplish this transformation (Davison & Ou, 2017). This is framed within the idea that cultural change, in this digital context, often tends to take longer than desired by managers; furthermore, and at the same time, it always gives rise to situations of unpredictability (Erdurmazli, 2021).

Today, it is a well-established and accepted fact that organizations of any kind need to be part of and embrace digital transformation, otherwise they cannot strive and succeed in the digital society we live in. For that to happen, organizational culture needs to reshape and be innovative in order to welcome and accommodate all the shifts that digital transformation brings about. This is neither an easy nor a straightforward process, and the culture and the people that make up organizations need to be prepared for the change. Digital transformation, more than being about automating processes and operations, as well as processing information, consists of creating an entirely new business model through digital information and technology. For such a change to occur, organizations need to rethink their operations at the individual, group and institutional levels. This process, while unavoidable for organizations, also presents them with challenges and difficulties to overcome. Leaderships with a mind-set on digital transformation, technology acceptance and adoption, training of specific and transversal competences, team adaptability and resilience and an organizational culture that fosters innovation and change are paramount for this process to be put in place and succeed. It is, thus, critical for organizations to establish an organizational culture that is receptive to and supportive of digital transformation, otherwise, it takes the serious risk of being left behind in the digital world.

5. Funding

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