

Beyond Boundaries: Assessing the Role of Digitalization in Elevating Innovation Capability within Organizations

Maciej Koczerga¹

¹Institute of Management, Pomeranian University in Słupsk,
Poland

Abstract— This report investigates the contradictory nature of digital transformation within organizations and its impact on innovation capabilities, specifically highlighting the potential detrimental effects on employee creativity. Although digital transformation is often lauded for enhancing innovation through various technological advancements and collaborative tools, this research highlights a critical yet underexplored consequence—the stifling of employee creativity. By examining the mechanisms of employee surveillance and digital stress, as well as the resultant information overload and decline in spontaneous interactions, the paper accentuates the human cost of an uncritical embrace of digitalization. It argues that while digital technologies can serve as catalysts for innovation, they can simultaneously erode the informal, creative spaces that foster original thought, ultimately impeding the very innovation they aspire to enhance. To reconcile the advantages of digital transformation with the need to preserve creativity, the paper suggests an approach that values and nurtures the human element alongside the adoption of new technologies.

Keywords— Digital Transformation, Innovation Capabilities, Employee Creativity, Digital Stress, Organizational Change

been identified as key drivers of innovation, with the potential to reshape entire organizations (Nasiri et al., 2020).

Researchers and business practitioners demonstrate much enthusiasm for digitalization and digital transformation due to several reasons. They perceive digitalization as a major driving force of innovation and disruption that challenges organizations. It empowers businesses to create novel solutions, novel value propositions and leverage digital technologies to improve their products, services and business models.

Digitalization and digital transformation offer opportunities for strategic and competitive advantage, leading to business growth. The easy accessibility and 24/7 availability of digital technologies make them more accepted and popular among all sectors. Overall, the potential benefits of digitalization and digital transformation in terms of innovation, competitiveness, and resilience drive the enthusiasm among researchers and business practitioners. The digital transformation process should not be however perceived as technological only, as it is people that make organizations and create novel and innovative products and services.

I. INTRODUCTION

The digital era has brought about significant changes in the way organizations operate and innovate. The role of broadly defined digitalization in enhancing innovation capability within organizations has become a topic of interest for researchers and practitioners alike. As organizations strive to adapt to the highly competitive landscape, it is essential to understand the influence of digital technologies on innovation capabilities.

Innovation in the present era requires not only perceiving change and seizing opportunities, but often reconfiguring organizations. Digitalization and digital transformation have

II. THE CONCEPT OF DIGITALIZATION

Digitization, digitization, and digital transformation are three different concepts that are often used interchangeably but with different meanings and implications. Digitization refers to the process of converting analog information or data into digital form (Iyamu et al., 2021). It involves the technical task of scanning or capturing analog records and converting them into digital data. Digitization in particular focuses on storing information in a digital format, making it easier and more manageable. It is often used in contexts where physical



documents such as books or records are converted into digital files. For example, in public health domain, digitization refers to the technological process of converting analog health records into digital data (Iyamu et al., 2021).

Digitalization, on the other hand, goes beyond the mere conversion of analog information into digital format. It refers to the broader integration and use of digital technologies in various aspects of an organization or industry (Warner & Wäger, 2019). Digitalization involves the adoption and implementation of digital technologies, such as mobile, artificial intelligence, cloud, blockchain, and Internet of Things (IoT) technologies, to improve business processes, enhance customer experience, and create new business models (Warner & Wäger, 2019). It is a process of widespread introduction and utilization of information and communication technologies in the economy (Puzina et al., 2021). Digitalization is focused on leveraging digital technologies to transform and optimize existing processes and operations (Björkdahl, 2020). It involves the integration of digital technologies into various functions and activities of an organization, such as marketing, sales, operations, and customer service (Björkdahl, 2020).

Digital transformation, on the other hand, is a more comprehensive and strategic concept that goes beyond the adoption of digital technologies. It refers to the fundamental and profound changes that occur in an organization or industry as a result of the strategic and pervasive use of digital technologies (Reis et al., 2018). Digital transformation involves not only the adoption of digital technologies but also the rethinking of business models, processes, and customer experiences (Reis et al., 2018). It is a cultural shift that pervasively integrates digital technologies and reorganizes services based on the needs of the public (Iyamu et al., 2021). Digital transformation is a complex and ongoing process of strategic renewal that aims to trigger significant changes through the integration of information, computing, connectivity, and communication technologies (Jnr et al., 2021). It is a holistic and organization-wide effort to leverage digital technologies to drive innovation, improve efficiency, and create new value propositions (Schallmo et al., 2017).

Digitalization and digital transformation in general are increasingly gaining importance in the modern business landscape due to its transformative impact on various aspects of business operations. The literature highlights several key reasons for the growing significance of digitalization in the contemporary business environment.

Digitalization is revolutionizing the way business is conducted within industrial value chains through the use of Internet of Things (IoT) technologies, intensive data exchange, and predictive analytics (Parida et al., 2019). This technological change enables businesses to enhance their operational efficiency, optimize processes, and gain valuable insights from data, thereby improving decision-making and overall performance.

The increasing digitalization of economies has emphasized the importance of digital transformation in helping businesses stay competitive in the market (Kraus et al., 2021). As digital technologies continue to advance, businesses are compelled to

adapt and leverage these technologies to remain relevant and meet the evolving demands of the market and consumers.

Digital transformation is widely recognized as an ongoing and indefinite process in which new digital technologies are utilized in the day-to-day operations of an organization. This process acknowledges the significance of agility as the fundamental mechanism for the strategic renewal of an organization's business model, collaborative efforts, and overall culture (Warner & Wäger, 2019).

This ongoing process underscores the continuous nature of digitalization and its impact on organizational strategies and structures.

Digitalization transforms business activities such as research and development, production, supply chain, and sales, and forms new data resources to help enterprises achieve lean management through data integration and analysis (Kuang et al., 2023). This transformation of business activities through digitalization enables businesses to streamline their operations, improve productivity, and adapt to changing market dynamics.

Digitalization and strategic flexibility are intertwined, with strategic flexibility enabling the application of new technology, and digitalization enabling flexibility, thereby contributing to business growth (Matalamäki & Joensuu-Salo, 2021). The interplay between digitalization and strategic flexibility underscores the symbiotic relationship between technological advancement and organizational adaptability.

Digital technology platforms significantly influence changes in modern business models and promote the implementation of innovative solutions within them. This highlights how digitalization drives the evolution of business models, fostering innovation and adaptation to emerging market trends. In addition, digitalization is an integral part of the development of the economy and society in modern conditions. This emphasizes the broader societal and economic implications of digitalization, positioning it as a fundamental driver of progress and development.

The digitalization of business refers to the application of contemporary digital technologies within an enterprise's activities, with the objective of altering the fundamental operational, procedural, organizational, and managerial aspects of the company. The growing importance of digitalization in the modern business landscape is thus attributed to its transformative influence on business operations, strategic renewal, market competitiveness, and overall societal and economic development. As digital technologies continue to advance, businesses are compelled to embrace digitalization to remain agile, innovative, and competitive in the evolving business environment.

The review of literature unambiguously highlights the hazards connected with neglecting the process of digitalization and digital transformation. These risks are often ignored while potential benefits for innovation capability are much applauded.

III. INNOVATION CAPABILITY AND ITS KEY COMPONENTS

Innovation capability is a critical factor for organizations, and is defined as the ability to continuously transform knowledge and ideas into new products, processes, and systems for the benefit of the firm and its stakeholders (Lawson & Samson, 2001). The presence of innovation capabilities is very important for developing innovation because it gives companies the flexibility to improve their products according to changing market expectations in maintaining growth (Liu et al., 2018). Innovation capability is a crucial aspect for organizations seeking to thrive in today's dynamic business environment. The concept of innovation capability has been extensively explored in the literature, with various studies focusing on different dimensions and determinants of innovation capability.

Innovation capability encompasses a wide range of organizational components and critical abilities that enable a firm to engage in innovation activities and create added value. For example, radical product innovation capability defined as the organizational components that comprise a firm's ability to engage in radical product innovation, including processes, resources, and structures (Slater et al., 2013), product innovation capability (Sharma & Martin, 2018), service innovation capability (Kohler et al., 2014). Technological capabilities are not the same as innovation capability, but play a significant role in the innovation capability of an organization. They enable firms to generate innovations and manage the implementation of these innovations, both internally and in collaboration with external sources of knowledge (Kale, 2011).

The ability to develop new technologies and manage the associated transactions is a fundamental aspect of innovation capability. Organizational culture, particularly managers' values and beliefs regarding their willingness to cannibalize, is identified as a key component of a firm's radical product innovation capability (Slater et al., 2013). This highlights the importance of fostering an organizational culture that encourages risk-taking and supports radical innovation initiatives.

Tacit knowledge transfer is another crucial component of innovation capability. Authors have stated that firm innovation capability is heavily reliant on the transfer of tacit knowledge, which significantly influences product performance (Çavuşgil et al., 2003). This emphasizes the significance of effectively transferring tacit knowledge within an organization to enhance its innovation capability. Knowledge however cannot be separated from human beings and their intellect.

Intellectual capital also contributes to creating innovation capability. Its main function is to provide the necessary resources and capabilities for organizations to generate and implement innovative ideas and solutions. Studies have shown that intellectual capital, including human capital, social capital, and dynamic capabilities, positively influences innovation capability (e.g Karadag et al., 2023, Farzaneh et al., 2023).

Specifically human capital refers to the knowledge, skills, and expertise of individuals within an organization plays a crucial role in driving innovation capability. Social capital encompasses the relationships, networks, and social

connections within and outside the organization. It enhances the utilization of human capital for innovation .

The concept of dynamic capabilities plays a significant role in innovations. These capabilities involve the ability to adapt, learn, integrate new knowledge and technologies and facilitate the development of innovation capability . Overall, intellectual capital provides the foundation for organizations to foster a culture of innovation and effectively leverage their resources and capabilities to drive innovation capability

This underscores the importance of leveraging intellectual capital to drive innovation within the organization. Another type of capabilities that are critical for innovation capability and need to be mentioned are knowledge management capabilities. These knowledge capacities are essential for effectively managing and leveraging knowledge to drive innovation within the organization (Lichtenthaler & Lichtenthaler, 2009).

By effectively leveraging these components, organizations can enhance their innovation capability and drive continuous innovation to achieve sustainable competitive advantage.

IV. THE INFLUENCE OF DIGITALIZATION ON INNOVATION CAPABILITY

The business and economics literature is currently characterized by a prevalent sense of enthusiasm regarding the impact of digitization on companies' capacity to foster innovation. Scholars highlight the close correlation between digitalization and the ability to innovate. Besides, it is widely agreed that digital technologies have not only substantially revolutionized the operational practices of various companies but also heightened their competitiveness in the market. Numerous instances are cited to illustrate how digitization aids in developing innovation capabilities. Digitalization facilitates new modes of collaboration for individuals and enables the exchange of knowledge thus positively contributes to open innovation. The emergence of crowdfunding and crowdsourcing platforms has further facilitated the innovation processes (Nambisan et al., 2017). Warner & Wäger (2019) point out that the application of digital technologies allows for the establishment of sensing capabilities in order to gather information through new digital devices, channels, and emerging user behaviors.

Research at the enterprise level shows that digitalization has a significant positive impact on innovation capability (Shoufu et al., 2023). Many companies are rethinking their digital strategies and looking for new business opportunities (Rachinger et al., 2019). It provides new opportunities for companies to innovate and create value, leading to product and service innovation, optimization of operations and improved customer engagement. Digitalization has also been shown to have a positive impact on the development of new green technologies. (Jia et al., 2022).

The ability to create new business models across various is notably improved by digital technologies. (Vaska et al., 2021). They offer fresh impetus and novel avenues for business model innovation (Liu, 2023). As Li (2020) has pointed out, the

creative industries have been identified as an important domain for business model innovations enabled by digital technologies. Parida et al. (2019) argues with great conviction that the mere utilization of digital technologies is insufficient, and it is crucial to engage in business model innovation in order to derive benefits from the process of digitalization (Parida et al., 2019).

It is important to acknowledge that the mere utilization of digital technologies does not solely result in business innovation. It is the process of digital transformation that plays a pivotal part. According to He (2022) digital transformation has a significant positive impact on corporate innovation, enhancing the willingness and intensity of innovation. Digital transformation mediates the relationship between digital technology adoption and firms' innovation performance (Sarfranz et al., 2022). The digital transformation of manufacturing enterprises leads to enterprise innovation. The relationship between these entities is facilitated by mechanisms concerning the investment in innovation, mechanisms governing cost control, and mechanisms that ensure profit guarantee (Zhao et al., 2022).

Achieving the benefits of digitization and digital transformation requires preparation on the organizational side. Employees play an important part in this area. The role of employees in the preparedness of organizations for digitalization is diverse and intricate. This encompasses their proficiency in digital literacy, their inclination for learning, their voice behavior, level of involvement, ability to lead, willingness to share knowledge, and their capacity for creativity. Their competencies, skills, and dedication play a crucial role in driving successful digital transformation in organizations (Çetindamar & Abedin, 2020). Thus, the implementation of a digital workplace strategy is essential to drive behavior change and improve competencies among employees (Hamburg, 2020). Employees' necessary skills for contributing to the digital evolution of the organization include creativity, innovation, initiative, logical and creative thinking, and readiness to manage organizational changes.

Researchers have produced a significant number of publications regarding digitalization and digital transformation. Their attitude is generally enthusiastic. Certain factors contributing to the effectiveness of digitalization and digital transformation are identified. The adequate readiness of both organizations and employees emerges as a particularly crucial factor. In recent times, there have been however several studies that have highlighted a multitude of shortcomings in the realm of digital transformation.

Around 70 percent of corporate digital transformation initiatives are unsuccessful in achieving their objectives, with low employee engagement being identified as an often encountered and recurring difficulty (McKinsey 2018). In a study conducted in 2019, corporate directors and CEOs expressed their viewpoint that digital transformation is their primary concern; however, empirical evidence also revealed that 70% of all efforts related to digital transformation fail to achieve their objective, resulting in an estimated loss of \$900 billion in investments (Tabrizi et al., 2019). More recent findings report as high as a 90% failure rate in the area of digital

transformation (Ramesh & Delen, 2021). The absence of a well-defined strategy and the influence of human factor are significant contributors to the failure of the digital transformation. The advice for succeeding in the digital transformation revolves then around designing an appropriate business strategy taking into consideration digital transformation. The reasons for the failures are also attributed to a misunderstanding of consumers' needs and priorities if the digital transformation was to improve consumer satisfaction and help build relationships with them. The advice in this case is extensive consumer research.

In addition, if employees regard digital transformation as a potential danger to their job stability, they might impede the progress of change and show resistance. The authors suggest however, that if employees are included in the process and consulted on how they could adapt to new circumstances, then they may enhance their skills and become part of the team, thereby facilitating a more seamless transition. This demonstrates the author's optimistic stance towards the matter of digitization and digital transformation. Thus, it is expected that the presence and significance of the potential consequences of digitalization, which indicate the probability of its negative impact on innovative capabilities, might be overlooked or diminished.

V. DIGITALIZATION AND INNOVATION CAPABILITIES - THE OVERLOOKED HUMAN FACTOR

The discourse surrounding the advantages of digitization and digital transformation is primarily characterized by enthusiasm. Publications within this domain accentuate the economic advantages offered by novel digital technologies. In this particular context, the social dimension and the human element are frequently disregarded. The promotion of digitization within academic journals and industry literature primarily serves businesses and is recommended as a strategic decision to maintain competitiveness and maximize profits. Simultaneously, it is essential to recognize that innovation plays a more significant role in the digital era than ever before. Digitalization forces organizations to innovate and modifies the forms of innovation (Frishammar et al. 2018).

Companies aspiring to raise their innovation capability depend on employees at every level of the hierarchy in the organization. It is the employees themselves who possess the ability to think creatively, generate novel concepts and proposals, and actively participate in the execution of innovative ideas (Lee et al., 2018). Organizations today cannot afford to have employees who are passive and silent (Kensbock & Stöckmann, 2021).

On the one hand, the proliferation and advancement of digital technologies require enterprises to rely on innovative concepts from their personnel for growth and sustainability, while at the same time organizations strive to consistently control and supervise employees using methods that were unimaginable fifty years ago (Bernstein, 2017). This situation makes a possible threat to the creativity of individuals.

Surveillance is defined as a “close, constant, and comprehensive supervision of a comprehensive set of activities, behaviors, and personal characteristics of the observed” (Bernstein 2017: 78). The domain of surveillance is expanding beyond the realm of blue-collar and field workers to include office workers as well. This extension involves the monitoring of various aspects employees' performance, such as output, phone call content, and location, as well as the observation of their personal characteristics through methods like e-recruitment and data mining (Ball 2010). The practice of overseeing employees from the viewpoint of their supervisors offers several benefits. It enables the improvement of work quality and productivity, facilitates the prompt evaluation of employees' adherence to their superiors' instructions, and provides valuable feedback cues to employees. Conversely, employees often perceive surveillance activities in a negative light. These activities are associated with heightened levels of stress, diminished job satisfaction, and increased employee turnover (Chalykoff & Kochan 1989; Holman et al. 2002).

Employee voice behavior is defined in literature as “speaking out and challenging the status quo with the intent of improving the situation” (LePine & Van Dyne 1998: 853). This type of behavior is beneficial for organizations, as stated by scholars. It enhances the quality of decision-making within the organization (Burris, 2012), increases overall effectiveness (Maynes & Podsakoff 2014), and fosters a competitive edge (Liu et al. 2010). Innovation and the development of novel approaches are triggered by questioning the status quo within an organization through the expression of one's voice. These transformative changes enable the development of solutions that ultimately enhance the organization in the highly competitive environment.

Kensbock and Stöckmann (2021) discovered that, in general, digital transformation has a positive impact on employee behavior. It initiates a process of motivation among employees, stimulating their inclination to acquire knowledge, which subsequently encourages them to voice their beliefs. However, the dynamics alter when employees perceive an increase in surveillance. In such circumstances, heightened surveillance resulting from digital transformation nullifies these favorable effects. Being subjected to the watchful eye of supervisors causes the innate desire of employees to grow and improve their environment to vanish. As Oldham & Da Silva (2015) have stated work digitalization may foster psycho-social hazards in the workplace, which include stress and threats to the well-being and security of individuals.

The application of digital technologies poses a significant challenge due to the vast amount and diverse range of information. Thus, the integration of this information to produce novel concepts becomes a demanding task (Huber, 1990). Individuals with a conscientious disposition may become overwhelmed by the excess of information and data, which may result in a lack of time and energy to work on and develop novel ideas. The presence of new information resulting from digitization, therefore, fails to foster creativity, instead may lead to a diminished capacity for generating innovative

ideas.

One consequence of employing digital technologies is the heightened level of stress encountered by individuals utilizing these solutions. A specific challenge, particularly evident in the context of mandatory remote work during the COVID-19 pandemic, is the perpetual sense of being immersed in professional responsibilities due to the constant connection to the company through computers. This problem also presents a challenge in effectively distinguishing between personal and professional time. As a result, this phenomenon contributes to an increased level of stress (MacCormick, Dery, & Kolb, 2013, Golden 2012). The increased stress, as a consequence, leads to a decrease in the ability to think creatively (Byron, Khazanchi, & Nazarian, 2010, Nöhammer & Stichberger, 2019).

The use of computer-based communication devices is associated with the possibility of reducing spontaneous and face-to-face conversations, as noted as early as the 1990s (Sarbaugh-Thompson & Feldman, 1998). Such discussions encourage the exchange of ideas and the unhindered exchange of viewpoints, as well as acquiring support for pioneering ideas. In-person gatherings are more conducive to impromptu, spontaneous discussions than interactions facilitated by electronic devices. Conversations of this nature have the potential to generate innovative concepts and garner support for them from others. Therefore, certain supervisors insist on employees being physically present at the workplace and remote work not being the default resolution. It can be deduced from these findings that the utilization of digital solutions will result in a decrease in the generation of novel ideas.

Conclusions

- 1) The excessive use of digital technologies can deplete the long-term capacity for innovation in corporations. This is because innovation stems from creativity and continuous research and development efforts, rather than solely relying on the use of digital technologies.
- 2) Research conducted by Usai et al. (2021) clearly indicates that digital technologies are associated with excessively high expectations. Gaining an advantage over competitors heavily relies on the allocation of resources towards research and development. Furthermore, an overemphasis on digitalization can result in the standardization and sterilization of organizational processes. This, in turn, renders companies more susceptible to imitation by their rivals, as each competitor has the capability to procure and implement identical digital solutions. However, it is important to note that the possibilities for combining these solutions are not infinite and do not indefinitely enhance utility. The promotion of digitalization and digital transformation entails encouraging investments in technologies that are already in use, rather than focusing on innovative solutions, products, or services. Conversely, innovation thrives on the foundations of knowledge, creativity, and intellectual capital (Usai et al., 2021). It is equally important to consider that digital transformation is not equally necessary for all companies and industries.
- 3) Digitalization will translate into increased innovation

capability only if it encourages, rather than suppresses, the creativity of employees. Within this domain, the primary responsibility of corporate boards lies in establishing a connection between the digitization of operations and the objectives and strategy of the organization. The implementation of digital transformation within a company necessitates the involvement of employees and must not occur without a thorough assessment of any potential unintended consequences. When considering investments in this area, it is crucial to bear in mind that innovation is a product of creativity and research and development, not solely the result of the use of digital technologies. Further examination is needed in this area, particularly into the factors driving the failures of digital transformation, as well as the hazards and unforeseen outcomes arising from the adoption of digital technologies.

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