International Journal of Arts Humanities and Social Sciences Studies
Volume 11 Issue 1 ǁ January 2026
ISSN: 2582-1601
www.ijahss.com

How Perceptions of Digital Transformation Shape Innovative Work Behavior: The Mediating Role of Organizational Norms

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ABSTRACT *:* This study aims to examine the effect of perceived digital transformation on innovative work behavior and to test the mediating role of organizational norms in this relationship. The research was designed within the framework of a quantitative survey model. Data were collected through online and face-to-face methods from 398 employees working in the manufacturing sector in the provinces of Elazığ and Osmaniye, Türkiye. The construct validity of the scales was assessed using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), while reliability was evaluated through Cronbach's alpha and split-half reliability coefficients. EFA results confirmed the single-factor structure of the perceived digital transformation (49.98%), organizational norms (50.41%), and innovative work behavior (49.33%) scales. CFA findings indicated that the measurement model demonstrated a good fit ($\chi^2/df = 1.071$; CFI = 0.995; RMSEA = 0.013). Reliability coefficients were high (DT $\alpha = 0.923$; ON $\alpha = 0.859$; IWB $\alpha = 0.907$). Correlation analysis revealed positive relationships among the variables (DT–ON $r = 0.225$; DT–IWB $r = 0.297$; ON–IWB $r = 0.403$; $p < 0.01$). Mediation analysis using PROCESS Model 4 showed that organizational norms partially mediated the relationship between perceived digital transformation and innovative work behavior (indirect effect $\beta = 0.08$; 95% CI [0.04, 0.12]). Overall, the results suggest that digital transformation enhances employee innovativeness and that normative structures constitute an important mechanism explaining this effect.

KEYWORDS: Perceived digital transformation, Organizational norms, Innovative work behavior, Mediation analysis, Sustainability.

I. INTRODUCTION

The rapid advancement of digital technology, rising social expectations, and intensified global competition have made digital transformation a key driver of organizational change across many sectors [1]. Accelerated developments in information and communication technologies have triggered digitalization-based transformations in a wide range of domains—including industry, education, agriculture, law, and the economy—thereby reshaping how institutions operate and conduct business [2].

In recent years, the increasing pace of digital transformation worldwide and the profound changes it has brought to various industries have made it imperative for organizations and societies to adopt and utilize digital technologies effectively. Accordingly, digital transformation is no longer a discretionary choice for contemporary firms; rather, it has evolved into a strategic necessity that must be fulfilled in order to remain competitive.

In the literature, digital transformation is conceptualized as a process that creates substantial changes in organizational characteristics by integrating information, computing, communication, and connectivity technologies, thereby transforming business processes, organizational structures, and corporate identity [3]. Similarly, digital transformation has been defined as a comprehensive change process that enables the strategic mobilization of key resources and capabilities through the innovative use of digital technologies and, in turn, facilitates the redefinition of an organization's value proposition [4].

Digital transformation is not merely limited to the implementation of advanced technologies within organizations; instead, it represents a holistic restructuring aimed at enhancing value creation capacity, strengthening responsiveness to environmental changes, and building sustainable competitive advantage. From this perspective, digital transformation involves the strategic redesign of organizational processes, business models, and operational practices [5].

This restructuring increases organizational efficiency and effectiveness by enabling automation-supported business processes and integrating insights derived from big data into decision-making mechanisms. In an era characterized by accelerating digital transformation, organizations are reshaping their strategies and procedures in line with sustainability goals; moreover, this process supports the strategic development of organizational capabilities [6–7].

Today's business environment exhibits a dynamic structure shaped by shifting priorities, intensified competition, and rapidly advancing technologies. In such a context, organizations need to systematically foster innovativeness, adaptability, and high performance in order to sustain their competitive advantage. Accordingly, it has become critical for organizations to empower a workforce that is proactive and innovative, capable of redefining existing work roles, and able to develop work systems to respond to evolving job demands [8–9]. Indeed, it has been emphasized that employees who demonstrate innovative behaviors are more likely to contribute more strongly to firms' digital initiatives [10].

Similar to other strategic resources within organizations, digital transformation is currently regarded as a fundamental prerequisite for supporting innovation [11]. Innovation is considered one of the key drivers of competitiveness and sustainability [12], and organizational innovation capacity is largely associated with employees' innovative work behaviors. In this respect, organizations rely on employees' willingness to adapt to change and participate in transformation processes in order to successfully implement evolving conditions [13].

The successful implementation of digital transformation is closely linked to employees' perceptions of digital technologies, their innovative tendencies, and the organizational support provided by the organization. This is because the effective integration of digital tools into daily work processes directly depends on employees' adoption and use of these tools. In this regard, employees are not merely passive recipients of transformation; rather, they are among the key actors shaping the direction, pace, and quality of transformation outcomes. As a matter of fact, digitalization can encourage innovative work behavior by transforming the ways employees perform their work, and such behaviors can make a critical contribution to organizational performance and success.

Innovative work behavior refers to employees' actions aimed at initiating, promoting, and implementing new or valuable ideas within an organization [14–15]. Similarly, Janssen (2000) defines this behavior as employees' generation, promotion, and realization of new and useful ideas in ways that contribute to their role performance, work group, and organization [16]. From this perspective, innovative work behavior is not limited solely to individual creativity; rather, it is considered a crucial employee outcome that strengthens firms' competitive position and innovation capacity through the implementation of ideas.

Existing studies highlight the importance of employee innovativeness in achieving digital transformation objectives and point to the need for further research examining employees' behaviors throughout the digital transformation process [17]. Digital transformation processes confront employees with the necessity of adapting to technology and coping with changes in organizational values [18]. Therefore, within the digital transformation context, employee perceptions become a critical determinant of transformation success, as they reflect how employees interact with their work environment, technology, and the organization [19–20].

To explain how employees can support the goals of digital transformation strategies, it is first necessary to understand which factors drive employee support. Indeed, the adoption of a digital transformation strategy is considered a crucial prerequisite for the feasibility and success of transformation initiatives [21].

At this point, the importance of organizational norms becomes particularly salient. Although existing studies have focused on the role of organizational culture in digital transformation processes, the extent to which the normative component of culture—namely organizational norms—functions as a mediating mechanism remains limitedly examined. Therefore, organizational norms can be considered a concrete mechanism that guides employees' behaviors in the context of digital transformation.

Digital transformation, through the widespread adoption of new technologies and work processes, is reshaping organizations worldwide. In this process, shared norms within organizations may function as a form of social glue by providing a guiding framework that determines which behaviors are considered appropriate and how employees should approach change. Accordingly, the literature suggests that shared norms and attitudes in the digital era may facilitate transformation or, conversely, slow down change through various resistance mechanisms.

Within an organizational context, one of the most fundamental elements shaping employee behavior is the set of values, beliefs, and particularly organizational norms shared among organizational members. Organizational norms serve as a regulatory mechanism that defines which behaviors are regarded as appropriate and acceptable within the organization, thereby guiding employees' attitudes and actions and contributing to the emergence of a supportive climate. When employees perceive this normative climate as supportive, they become more strongly motivated to engage in the generation, implementation, and sustainment of innovation [22].

It is widely acknowledged that organizations tend to develop a distinctive system of norms over time and that these norms play a significant role in shaping employees' innovative behaviors. Specifically, norms help employees recognize which behaviors are encouraged and which may be constrained, thereby strengthening motivation toward organizational practices, enhancing innovation awareness, and laying the

groundwork for higher economic outcomes for firms. Empirical studies indicate a positive relationship between shared organizational norms and values and employees' innovative behaviors [23].

In organizations undergoing digital transformation, developing organizational norms that position experimentation, calculated risk-taking, and creativity as legitimate and supported behaviors is critical for fostering and sustaining innovation [24]. Accordingly, this study examines the mediating role of organizational norms in the relationship between perceived digital transformation and innovative work behavior.

II. LITERATURE REVIEW

2.1 Digital Transformation

Although digital transformation has increasingly attracted scholarly attention in recent years, there remains considerable ambiguity regarding its definition. In particular, the literature indicates that there is no single, widely accepted, uniform, and comprehensive definition of what is precisely meant by digital transformation [25]. In this context, the term digital transformation first appeared in academic research in the early 2000s, and its relevance has continued to grow throughout the 2020s [26]. This ambiguity is further amplified by the fact that the concept is employed at different levels across the literature. Indeed, digital transformation is often used to refer to multiple, distinct concepts that require clear definition and differentiation, including strategic business changes, process automation, and efficiency improvements [26–27].

In its simplest form, digital transformation can be described as a process that triggers substantial changes within organizations through the convergence of information, communication, and connectivity technologies and continues through the use of new digital technologies in everyday organizational life [28]. Ilvonen et al. (2018) conceptualize digital transformation as a process in which a firm employs modern and advanced digital technologies—such as artificial intelligence and big data—to achieve changes in its production, service, and operational methods [29]. Digital transformation, also referred to as digitalization, generates changes in the activities of individuals and organizations by implementing digital technologies to create major advances in personal experiences, business practices, and new business models [30]. In addition, digital transformation involves integrating new business models, digital technologies, and data into corporate services and establishing intelligent procedures [31–32]. Collectively, these definitions suggest that digital transformation is not merely a technological implementation; rather, it is a fundamental and multidimensional restructuring process that transforms the ways organizations operate. This multidimensional transformation requires not only the adoption of technological tools but also the reconfiguration of organizational structures, operational routines, and competitive strategies.

For digital transformation to occur, most organizations need to modify their organizational structures, business models, and processes [33–34]. The primary reason for this is that, with the rise of the internet and other related digital technologies, firms have increasingly faced rapidly changing technological and socio-technical environments [35]. This pressure compels firms to engage in technological renewal at the strategic level, and new digital technologies, in turn, trigger shifts in strategic orientation for many organizations. Accordingly, to remain competitive, organizations must accelerate the pace at which they adopt and implement appropriate technologies [31].

Digital transformation aims to implement digitalization across the entire organization by focusing particularly on employees and work processes, as it is a complex and challenging process that requires the involvement of people, technology, and all organizational resources [36]. Moreover, digital transformation is driven by both people and technology. Companies that listen to their employees and actively involve them in digital transformation are more likely to succeed in the digital future [31].

Scientific evidence demonstrates that human capital plays a pivotal role in the digitalization process [37]. Accordingly, as digitalization accelerates, firms do not merely implement digital systems; they also place greater emphasis on developing employees' competencies and innovative capacity in order to sustain performance under constantly changing environmental conditions and to support employees' work–life balance.

The link between employee perceptions and digital transformation has long attracted researchers' attention within the technology adoption paradigm [38]. Within this approach, it is widely acknowledged that effective technology use and adoption are largely shaped by employees' attitudes toward technology and their intentions to use it [39]. More recent studies, however, more strongly emphasize that employees and the support they provide throughout the transformation process are critical determinants of the success of digital transformation strategies [21,40]. This is because employees are not passive actors who are only affected by the outcomes of digital transformation; rather, they are key stakeholders who play a direct role in the implementation and sustainability of transformation efforts [41].

For a successful digital transformation process, it is essential not to overlook the human competencies required by the digital era. Employees are not merely influenced by digital transformation practices carried out within the organization; they are also active agents who directly shape the direction and success of the

transformation. Indeed, digital transformation is a comprehensive process that entails organization-wide change, and effective management of this process requires understanding employees, taking their expectations into account, and supporting their participation in transformation initiatives. In this context, investing in people and systematically developing digital skills are critical for organizations to adapt to changing global conditions and to maintain their existence in a sustainable manner. Equipping employees with competencies aligned with the requirements of the digital age and effectively integrating them into new business models are among the core elements that strengthen the continuity of transformation. Therefore, in order to manage digital transformation successfully and sustainably, organizations need a workforce that has internalized digital transformation and possesses a digital mindset and the necessary skill set; accordingly, employing employees with the right qualifications plays a decisive role in the success of transformation.

One of the most visible outcomes of this multidimensional transformation for organizations is the reshaping of innovation capacity. Digital transformation has the potential to accelerate progress particularly in green technologies, products, and services by unlocking firms' innovation potential through new technologies, operating modes, and ideas [42]. At the same time, digital transformation contributes to the more effective optimization of organizational structure, corporate culture, and strategic orientation by integrating the human factor with technological infrastructure [43–45]. From this perspective, digital transformation is considered a critical catalyst for the development of sustainable innovation. It enables firms to redesign their operations, products, and business models with modern digital technologies while considering environmental, social, and economic priorities, thereby supporting the emergence of new value propositions and aligning processes with sustainability goals. However, the extent to which transformation produces effective and lasting outcomes depends on ensuring that technical implementations are not limited solely to technology investments, but are carried out in an integrated manner with leadership approaches, organizational culture, and workforce competencies [46].

2.2 Innovative Work Behavior

Employees are among the most fundamental elements sustaining organizations' day-to-day operations. In this regard, the innovative behaviors exhibited by employees play an important role in supporting organizational innovation and strengthening competitive power. Innovative work behavior is considered a critical form of behavior that enables the generation of solutions to problems arising in working life and makes it possible to enhance the effectiveness of work processes. Therefore, employees' adoption of such behaviors contributes to strengthening the processes of generating, developing, championing, and implementing ideas [47].

Organizations' ability to develop an innovative structure largely depends on employees' willingness to embrace innovative behaviors and reflect them in their daily work processes. The expression of innovative work behavior at the individual level strengthens organizational performance and provides meaningful contributions to organizational success. For this reason, the long-term sustainability of organizations is closely linked to employees' tendencies to generate innovations and their capacity to transform these tendencies into behavior [48]. Indeed, innovative work behavior refers to a multi-stage domain of activity encompassing the processes of exploring, developing, proposing, and implementing new ideas [49].

Innovative work behavior is defined as behavior aimed at initiating and realizing new and useful ideas, processes, products, or procedures within one's role, work group, or organization [15]. In addition, Janssen (2000) defines innovative work behavior as employees' intentional generation, promotion, and implementation of new ideas within a group or organization in order to contribute to performance [16].

Thurlings et al. (2015) define innovative work behavior as the processes through which new ideas are generated, developed, and implemented to enhance employees' role performance within organizations [50]. In other words, employee innovativeness refers to the creation of something new and potentially valuable—including new management processes, production methods, products, and services—that contributes to an organization's continuity, evolution, and advancement in a highly competitive environment [51]. In this framework, AlEssa and Durugbo (2022) emphasize that innovative work behavior is shaped by employees' use of original thinking skills to support innovation within their organization, their ability to generate creative ideas, and their demonstrated competence and willingness to solve problems [52]. In today's rapidly changing business environment where competition is intensifying, organizational continuity depends on the ability to continuously adapt to environmental conditions and to implement innovation-oriented practices in a sustainable manner.

For a behavior to be considered within the scope of innovative work behavior, it is first expected to be exhibited in a deliberate and purposeful manner and, ultimately, to generate a novel solution that provides tangible benefits. Therefore, merely thinking creatively or generating ideas is not sufficient on its own; rather, the defense of these ideas within the organization, their receipt of support, and their translation into practice constitute an integral part of the process. From this perspective, any innovation-oriented initiative that creates

value for the organization may be regarded as innovative work behavior. Moreover, innovative work behavior refers to organizational members' efforts to go beyond established ways of working and routine practices by developing new tasks and methods, obtaining approval for them, and putting them into practice. Indeed, organizational routines may not always enable rapid responses to changing conditions. For this reason, in today's dynamic work environment, the emergence, support, and implementation of new methods have become a critical necessity.

At this point, the conditions under which innovative work behavior emerges also become important. The emergence of this behavior is often associated with an organizational environment that supports diversity, views trial-and-error as an opportunity for learning, and provides employees with the necessary resources and support throughout the development and implementation of innovative ideas. In this regard, Bawuro et al. (2019) define innovative work behavior as a deliberate approach through which employees contribute to organizational goals by generating, managing, and implementing new ideas that can provide the organization with competitive advantage and sustainability [53]. Within this framework, the capacity for innovative thinking and problem solving can enhance organizational competitiveness by enabling more efficient work processes and the development of higher-quality products and services. Accordingly, innovative work behavior may be considered a core employee outcome that strengthens organizations' adaptability and innovation performance during change processes such as digital transformation.

2.3 Organizational Norms

The concept of norm refers to a set of rules and standards that characterize individuals' behaviors and indicate how they should behave; in other words, norms guide behavior and constrain it within certain criteria. In this sense, norms function as social regulators that determine which behaviors are considered appropriate under specific conditions. According to Coleman and Kerbo (2003), a norm can be defined in its simplest form as "social rules that indicate which behavior is acceptable in certain situations" [54]. This definition highlights that norms provide guidance not only based on individual preferences but also grounded in social and organizational acceptance processes.

Norms are addressed as "a rule governing a particular pattern of social behavior" and are emphasized to encompass two primary dimensions of meaning [55]. In the first sense, norms refer to behavioral patterns that are customary and considered "normal" within a society. In the second sense, norms represent the "desired form of behavior," regardless of whether actual behavior aligns with this ideal. Within this second meaning, compliance with norms is often reinforced through positive sanctions such as rewards, whereas violations of norms may be met with negative sanctions such as punishment. Accordingly, norms provide a normative framework not only concerning what behavior is, but also what behavior ought to be.

Hughes et al. (2002) state that in everyday language, norms are used as social rules that distinguish appropriate from inappropriate behaviors. Such norms sometimes appear as imperative commands indicating what people should or should not do, while at other times they take the form of advisory statements suggesting what would be more appropriate to do [56]. Thompson and Hickey (2002) define norms as "rules that guide the behavior of group members and are expected to be followed at the appropriate time and in the appropriate place" [57]. This perspective indicates that norms are guiding regulations that shape how group members are expected to think and act within a particular social setting.

The function of norms within an organizational context is often addressed together with the behavior-guiding aspect of organizational culture. In this regard, norms are among the elements that influence behavior, institutionalize the social system, and strengthen it within organizational culture [58]. Organizational norms, as behavioral rules and standards adopted by the majority of employees, determine how organizational members behave within the organization, how they establish relationships, and how they communicate with others [59]. In this respect, norms constitute a fundamental reference point for maintaining internal order and directing employee behavior within a defined framework.

In organizations, employees' roles are largely evaluated through norms. In some cases, an organization's cultural norms may also be endorsed through legal frameworks, emerging as formal rules and standards that regulate employees' attitudes toward the organization, moral behaviors within the workplace, compliance with authority, and ways of assuming responsibility [59]. Such norms are influential in defining the roles expected from an employee and also function as a mechanism that legitimizes and confirms the performance of these roles. At the same time, norms contribute to preventing roles that might be unjustly demanded from employees by providing a guiding framework indicating which roles employees should assume and which they should not. Therefore, organizational norms not only constrain employee behavior but also shape roles and expectations within the organization, serving as a fundamental regulatory element that guides behavior.

2.4 Relationships Among Variables and Hypothesis Development

2.4.1 Perceived Digital Transformation and Innovative Work Behavior (DT–IWB)

Technological advancements have led to significant shifts in customer expectations, making it increasingly necessary for employees to act more creatively and develop new solutions in order to respond to changing demands [60]. Behaviors expected to achieve organizational goals are addressed within the framework of innovative work behavior (IWB), which involves exploring new methods and technologies, developing innovative practices, and integrating them into work processes [61]. In this regard, organizations undergoing digitalization encourage employees to exhibit adaptable and innovation-oriented behaviors [10].

Over time, digital transformation has become increasingly critical for both organizations and employees by transforming numerous aspects ranging from ways of doing business to work arrangements. This transformation also shapes employees' attitudes toward adopting new work practices; therefore, perceived digital transformation and innovative work behavior emerge as two complementary and mutually reinforcing concepts.

A growing body of research has examined the link between digital transformation and employee innovation. For instance, a study by Westerman et al. (2014) reported that organizations undergoing digital transformation experience higher levels of innovation, as employees are empowered to utilize digital tools and technologies to generate new ideas and solutions [62]. Similarly, Hanelt et al. (2021) found a positive relationship between digital capabilities and innovation outcomes in organizations [26]. These findings indicate that digital transformation initiatives create a favorable environment for fostering employee innovation.

Digital transformation technologies expand employees' access to data and information, thereby increasing cognitive diversity. This, in turn, strengthens creative problem-solving processes and supports the generation of innovative ideas. In this respect, digital tools not only enable employees to express their creativity but also allow them to develop innovative practices that can improve work processes. Moreover, digital transformation may increase employees' motivation to display innovative work behavior by making organizational processes more effective and efficient. In particular, the data accessibility and collaboration opportunities provided by digital systems create a conducive foundation for developing ideas and converting them into implementable solutions. As the level of technology use increases, employees can act with greater accumulated knowledge in integration and development processes, making it possible to produce more creative outputs.

Several studies have examined the impact of digital transformation on employees' innovation behaviors at the micro level. From an individual characteristics perspective, Jiang and Yu (2022) emphasized that digital transformation may support innovative behaviors by activating employees' promotion focus [63]. Similarly, adopting an individual engagement perspective, Hu and Hui (2023) argued that digital transformation processes enhance employee engagement, and that this increase encourages the display of innovative behaviors [64]. In contrast, AlDhaheri et al. (2023) focused on the determinants of employee innovation behavior in the context of digital transformation and demonstrated that organizational support, leadership encouragement, and access to digital resources are critical factors for employee innovation [65]. These findings indicate that internal organizational factors—including organizational mechanisms such as performance appraisal practices—play an important role in strengthening the emergence of innovative behaviors in digitalized work environments.

It has been noted that the increasing level of new technology use produces considerable effects on employee performance [66]. Digitalized work systems may improve performance outcomes by enabling employees to carry out many tasks faster, more flexibly, and with a higher level of self-management compared to the past [67]. Organizations that can effectively integrate work processes with digital technologies encourage employees to benefit from the opportunities offered by these technologies and support the use of new applications [68]. This transformation enhances employees' performance capacity—primarily by facilitating the automation of routine tasks, providing real-time data and insights, and making decision-making mechanisms more functional—thereby contributing positively to performance outcomes [69]. These performance effects increase employees' capacity to experiment with new ideas and translate them into practice by allowing work to be carried out more flexibly and rapidly, thus creating a favorable foundation for the emergence of innovative work behaviors.

In recent years, studies aiming to explain the individual-level effects of digital transformation on innovative behavior have gained increasing importance, particularly alongside research focusing on how and under which conditions digital technologies can be used effectively to enhance innovative behavior in organizations. In this respect, Mauerhoefer et al. (2017) suggested that digital transformation processes may shape employees' innovative behaviors and influence their emergence [70]. Moreover, employees are considered among the key determinants of organizational success in terms of managing change processes, fostering creativity, supporting learning, and sustaining innovation generation [70]. Accordingly, given that

perceived digital transformation is regarded as an important organizational context and facilitating factor that enhances employees' innovative work behavior, the following hypothesis was developed:
H1: Perceived digital transformation has a significant and positive effect on employees' innovative work behavior.

2.4.2 Perceived Digital Transformation and Organizational Norms (DT–ON)

Accelerating advances in digital technologies, shifting customer expectations, and intensified global competition have made digital transformation a fundamental driver of organizational change. Recent studies emphasize that digital transformation cannot be explained solely through investments in technical infrastructure; rather, the success of transformation is closely related to "human-centered" elements such as organizational culture and leadership [5]. Although technological developments constitute a necessary condition for transformation, they may be insufficient to generate the expected change when they are not integrated with a supportive organizational structure and the human factor. Accordingly, it is argued that transformation initiatives that lack cultural readiness and are not managed effectively often fail to achieve their intended outcomes [69]. In this respect, the normative dimension of organizational culture that guides behavior can be considered a concrete mechanism shaping employees' attitudes and responses to change during the digital transformation process.

Zhang et al. (2023) examined the determining role of organizational culture in the success of digital transformation projects in companies operating in China. Their findings indicate that organizations with a culture that encourages innovativeness, learning, and controlled risk-taking are more likely to achieve more positive outcomes from digital transformation initiatives [72]. Such a cultural orientation can be explained by the strengthening of norms that legitimize behaviors such as innovating, learning, and taking risks within the organization. Similarly, a study conducted by Zoppelletto et al. (2023) in the context of SMEs focused on the relationship between digital transformation and organizational culture support. The authors revealed that SMEs adopting digital technologies are more inclined to develop a cultural climate that prioritizes collaboration, transparency, and employee empowerment [73]. These cultural characteristics are argued to contribute to strengthening innovativeness and agility and to facilitate organizations' more effective adaptation to rapidly changing market conditions. These findings suggest that strengthening norms such as collaboration and transparency may be critical for the success of digital transformation.

Recent bibliometric analyses and machine learning-based investigations have also shown that the focus of studies addressing the relationship between digital transformation and organizational culture has evolved over time. Specifically, the literature has increasingly shifted toward themes such as workforce transformation, innovation ecosystems, and cultural flexibility within the framework of Industry 4.0 [46]. This shift indicates that, in the digital age, organizations are required not only to revisit their cultural values but also to reshape the normative structures that regulate employee behavior.

Although breakthroughs may sometimes result from serendipitous developments or general technological progress, they are often shaped by individual- or team-based ideas. For this reason, enabling the innovation process requires not only supporting creativity but also creating an environment that allows ideas to be generated, developed, encouraged, and transformed into implementation by employees. At this point, establishing an appropriate organizational foundation for digital transformation can be considered a critical element that strengthens innovative outcomes. In the formation of such a foundation, organizational norms—by defining which behaviors are supported and which practices are regarded as appropriate—emerge as a key regulatory mechanism that legitimizes innovative initiatives. Accordingly, based on the assumption that perceived digital transformation strengthens shared norms within the organization, the following hypothesis was developed:
H2: Perceived digital transformation has a significant and positive effect on organizational norms.

2.4.3 Organizational Norms and Innovative Work Behavior (ON–IWB)

In an increasingly competitive business environment, innovation is regarded as one of the key determinants enabling organizations to achieve sustainable success. At the same time, establishing an organizational culture that supports and encourages innovativeness is considered a strategically important necessity [74]. On the other hand, organizational change processes create a dynamic that intensifies competition, as such processes bring about substantial transformations in strategy, technology, and operational domains. These transformations are not limited to structural aspects; they also lead to significant changes in systems and management styles. Therefore, it is argued that changes occurring within organizations should be addressed comprehensively in terms of values, beliefs, and behavioral patterns. Indeed, it is emphasized that innovation plays a critical role throughout this change process [75].

A culture that embraces innovation as an organizational value and in which rules related to innovation are widely accepted across the organization provides an important foundation for supporting innovative work behavior by strengthening employee commitment [76]. Indeed, the presence of an organizational culture that promotes innovation is considered critical for bringing innovation into practice [77]. Such a cultural climate facilitates employees' engagement in innovative behaviors by enhancing their intrinsic motivation.

Organizational culture is viewed not only as a reflection of an organization's value system but also as a holistic structure encompassing behavioral norms, working styles, and managerial approaches. Within this framework, organizational norms represent the appropriateness-related dimension of culture that guides employee behavior, thereby determining the boundaries within which innovative behaviors are likely to emerge. In this respect, while organizational culture influences daily organizational functioning, it can also significantly shape employees' innovative work behaviors. Accordingly, examining the relationship between organizational culture and innovative behavior contributes both to a better understanding of organizational processes and to explaining the conditions under which innovative behaviors arise. Indeed, culture facilitates employees' adaptation to the organization, supports their more effective participation in work processes, and functions as a regulatory mechanism that shapes behavioral tendencies toward innovation. This normative structure enables employees to recognize which innovative initiatives are supported and which behaviors are considered appropriate, thereby making the processes of idea suggestion and implementation more "legitimate" and psychologically safe. In this context, organizational support and an innovation-promoting climate strengthen employees' innovative work behavior, while transforming culture in an innovation-oriented manner emerges as a key factor that enhances an organization's strategic adaptability.

Recent empirical evidence reveals a strong relationship between organizational culture support and employees' innovative work behaviors. For example, in an international study conducted by Lee (2020), firms in South Korea and the United States were examined, and it was found that a supportive organizational culture that values creativity and allocates resources to innovation activities significantly influenced employees' innovative behaviors in both countries [78]. A substantial part of this effect may be interpreted through the strengthening of norms that define innovation generation as an "appropriate and expected behavior" within the organization and employees' tendency to comply with these norms. These findings suggest that a cultural environment supportive of innovation may motivate employees not only to adapt to change but also to generate innovations more actively. Accordingly, organizations can enhance their innovation and adaptation capacity by building a supportive culture, thereby increasing their likelihood of success in an increasingly competitive business environment. Nevertheless, future studies are encouraged to develop empirical models that quantify these relationships more systematically and identify which practices produce more effective outcomes for organizations aiming to enhance their digital capabilities. In this respect, it can be argued that organizational norms supporting innovation constitute a fundamental normative foundation that strengthens employees' innovative work behavior. Accordingly, the following hypothesis was developed:

H3: Organizational norms have a significant and positive effect on employees' innovative work behavior.

2.4.4 The Mediating Role of Organizational Norms

To explain how digital transformation influences employees' innovative work behavior, it is important to identify the organizational mechanisms through which this relationship operates. Digital transformation processes not only increase the use of technological tools but also reshape the normative framework within the organization regarding "which behaviors are appropriate and expected." Within this framework, organizational norms may function as a regulatory mechanism that determines the extent to which employees perceive innovative behaviors—such as trial-and-error, learning, knowledge sharing, and calculated risk-taking—as legitimate and supported actions. In other words, the influence of perceived digital transformation on employee behavior becomes more evident to the extent that this transformation contributes to strengthening norms that encourage innovativeness within the organization. Accordingly, it is proposed that organizational norms mediate the effect of perceived digital transformation on innovative work behavior. Therefore, the following hypothesis was developed:

H4: Organizational norms mediate the effect of perceived digital transformation on employees' innovative work behavior.

III. METHOD

3.1 Research Model

In this study, the effect of perceived digital transformation on innovative work behavior was examined, and the mediating role of organizational norms in this relationship was tested. The research model was examined using Model 4 of Hayes' (2018) PROCESS Macro v4.3 [79].

3.2 Sample

The population of this study consisted of blue-collar workers and white-collar employees working in the manufacturing sector in the provinces of Elazığ and Osmaniye, Türkiye. The manufacturing sector was selected as the sampling context because it allows the direct observation of the effects of digital transformation practices and organizational norms on employees' work processes. Convenience sampling was employed in the study. The survey form was delivered to 450 participants through online and face-to-face methods, and responses were obtained from 398 employees.

While Cattell (1978) suggests that the sample size should be three to six times the total number of items, Hair et al. (2010) emphasize that the sample should be at least five times the number of items included in the measurement instrument [80–82]. The measurement instrument used in this study consisted of 28 items in total, excluding demographic questions. Accordingly, the data obtained from 398 participants meet both criteria, indicating an adequate sample size and allowing for reliable analyses.

In addition, the research process was conducted after obtaining approval from the relevant ethics committee. Participants were informed about the purpose of the study, participation was voluntary, and informed consent was obtained. Anonymity and confidentiality principles were strictly observed during the survey administration, and no personally identifying information was requested. The data collection process was carried out in January 2026 through online and face-to-face methods following the approval of the Osmaniye Korkut Ata University Ethics Committee (Decision No. 36991, January 2026).

3.3 Data Collection Instruments

The survey form used in this study consisted of four sections: (i) demographic information about participants (age, gender, marital status, education level, and professional experience), (ii) perceived digital transformation, (iii) organizational norms (perceptions of organizational norms in the context of cultural tightness–looseness), and (iv) innovative work behavior.

Perceived Digital Transformation: To measure participants' perceptions of the digitalization process in their organizations, the 12-item scale used in Turkish by Sağlam (2019) was employed. The scale is unidimensional and was administered using a 5-point Likert-type response format (1 = Strongly disagree, 5 = Strongly agree) [83].

Organizational Norms: To assess employees' perceptions of prevailing "appropriate/expected" behaviors in the workplace, a 6-item scale based on the cultural tightness–looseness theory and used by Özeren (2011) was utilized. The scale was administered using a 6-point Likert-type response format (1 = Strongly disagree, 6 = Strongly agree) [84].

Innovative Work Behavior: To measure employees' levels of generating, disseminating, and implementing new ideas in their work processes, the Turkish adaptation of the scale developed by De Jong and Den Hartog (2010) was employed. The scale consists of 10 items and was rated using a 5-point Likert-type format (1 = Never, 5 = Always) [15].

Because the scales included different Likert response formats (5-point and 6-point), the variable scores were standardized in the analyses to enhance cross-scale comparability. Accordingly, the total/mean scores for perceived digital transformation, organizational norms, and innovative work behavior were converted into z-scores and included in the analyses. In this way, potential methodological biases arising from differences in measurement ranges across the scales were minimized. Scale scores were calculated by taking the mean of responses to the items of each scale and then transforming these values into z-scores.

3.4 Data Analysis

In this study, which adopted a quantitative research design, data were collected through structured questionnaire forms. The survey data were first entered into SPSS 25, and data cleaning procedures (i.e., checking for missing data and examining outliers) were performed. To reduce the risk of common method bias that may arise from collecting all data using the same measurement instrument, the questionnaire was administered anonymously and participants were informed that there were no right or wrong answers. In addition, to assess common method variance, an examination based on the single-factor test was conducted, and the one-factor structure did not demonstrate an adequate fit to the data. After screening the dataset, the final number of valid participants was confirmed, and the demographic distribution of participants was summarized using descriptive statistics. The analysis process was conducted in a staged manner, including descriptive statistics and assumption checks, testing of the measurement model, and hypothesis testing.

To examine the construct validity of the scales used in the study, Confirmatory Factor Analysis (CFA) was performed and model fit indices were evaluated. Subsequently, the mean and standard deviation values of each variable were calculated, and the reliability of the scales was assessed using Cronbach's alpha and split-half reliability methods. Pearson correlation coefficients were examined to identify relationships among the

scales, and simple linear and multiple regression analyses were applied to determine the effects on the dependent variable.

In line with the main purpose of the study, Hayes' PROCESS Macro (Model 4) was employed to test the mediating role of organizational norms in the relationship between perceived digital transformation and innovative work behavior. In this analysis, the bootstrap method was used to test the mediation effect robustly, and 95% confidence intervals obtained through 5,000 resamples were reported. In addition, to evaluate whether the relationships among variables were independent of demographic characteristics, the potential effects of age, gender, education level, and experience were examined as part of supplementary analyses. However, the primary hypothesis tests were reported within the framework of Hayes' PROCESS Model 4 approach. Total, direct, and indirect effects were evaluated in terms of statistical significance, and the findings were tabulated to demonstrate the validity of the mediation hypothesis.

IV. RESULTS

4.1 Demographic Data

Table 1. Demographic Characteristics of Participants

Demographic Characteristic	Category	f	%
Age	18–25	76	19,1
	26–33	128	32,2
	34–41	89	22,4
	42–49	73	18,3
	50+	32	8,0
Education Level	High School	49	12,3
	Associate Degree	121	30,4
	Bachelor's Degree	180	45,2
	Postgraduate Degree	48	12,1
Gender	Male	350	88,0
	Female	48	12,0
Marital Status	Married	233	58,5
	Single	165	41,5
Work Experience	Less than 1 year	96	24,1
	1–5 years	95	23,9
	6–10 years	110	27,6
	11–15 years	52	13,1
	16 years and above	45	11,3
Total		398	100

As shown in Table 1, of the 398 employees who participated in the study, 32.2% were aged 26–33, 22.4% were aged 34–41, 19.1% were aged 18–25, 18.3% were aged 42–49, and 8.0% were aged 50 and above. The vast majority of the participants were male (88.0%). Regarding education level, 45.2% of the participants held a bachelor's degree, 30.4% held an associate degree, 12.3% were high school graduates, and 12.1% had a graduate degree. In terms of marital status, 58.5% of the participants were married and 41.5% were single. With respect to work experience, 27.6% had 6–10 years of experience, 24.1% had less than 1 year of experience, 23.9% had 1–5 years of experience, 13.1% had 11–15 years of experience, and 11.3% had 16 years and above.

4.2 Reliability Results of the Scales

Cronbach's alpha and split-half analyses were conducted to assess the internal consistency of the scales. Cronbach's alpha values were $\alpha = .859$ for Organizational Norms (ON), $\alpha = .923$ for Perceived Digital Transformation (DT), and $\alpha = .907$ for Innovative Work Behavior (IWB). These values are well above the commonly accepted threshold of .70 in the social sciences [81,85], indicating high reliability. Split-half analyses also yielded high correlation coefficients between the two halves, with Spearman–Brown and Guttman coefficients exceeding .85. These results confirm that the scales have a homogeneous structure.

4.3 Validity Results

4.3.1 Exploratory Factor Analysis (EFA)

Table 2. KMO and Bartlett's Test Results

Scale	KMO	Bartlett χ^2	df	p
Perceived Digital Transformation (12 items)	0.963	2317.474	66	< .001
Organizational Norms (6 items)	0.898	890.914	15	< .001
Innovative Work Behavior (10 items)	0.950	1782.353	45	< .001

According to the EFA results, all three scales confirmed the expected factor structure. The KMO values exceeded .80, and Bartlett's test of sphericity was significant ($p < .001$). A KMO value above .80 together with a significant Bartlett's test indicates that the data are suitable for factor analysis [81].

Table 3. Factor Loadings and Explained Variance

Scale	Factor Loadings	Explained Variance (%)
Perceived Digital Transformation	.671 – .748	49,978
Organizational Norms	.701 – .723	50,417
Innovative Work Behavior	.659 – .742	49,333

Factor loadings ranged between .701 and .723 for the ON scale, .671 and .748 for the DT scale, and .659 and .742 for the IWB scale. Since all factor loadings exceeded the acceptable threshold of .40, they can be considered adequate [81]. The explained variance values were 50.417% for ON, 49.978% for DT, and 49.333% for IWB, indicating acceptable levels with values close to 50%. Overall, all three scales support a unidimensional structure and demonstrate sufficient explained variance.

4.3.2 Confirmatory Factor Analysis (CFA)

Table 4. Goodness-of-Fit Indices of the Measurement Model

Fit Index	Recommended Value	Measurement Model
χ^2/df	$0 < \chi^2/df \leq 5$	1.071
CFI	≥ .90	.995
TLI	≥ .90	.995
IFI	≥ .90	.995
NFI	≥ .90	.932
GFI	≥ .90	.940
AGFI	≥ .90	.930
RMR	≤ .10	.071
RMSEA	≤ .08	.013

The results indicate that the model demonstrates an excellent fit to the data. In particular:

- The χ^2/df ratio was 1.071, which is below 5 and close to 3, indicating that the model exhibits an acceptable and even excellent fit [86].
- The CFI, TLI, and IFI values (.995) meet the criterion of ≥ .95 recommended by Hu and Bentler (1999), suggesting a very strong model fit [87].
- The NFI (.932), GFI (.940), and AGFI (.930) values are also above the threshold of .90, indicating an acceptable fit [88].
- The RMR value (.071) falls within acceptable limits (< .10).
- The RMSEA value (.013) is below .05, indicating an excellent model fit [89]. In addition, the result of PCLOSE = 1.000 suggests that the model's close-fit hypothesis cannot be rejected and that the approximation error is not meaningfully different from zero, further supporting strong model fit.

Overall, these findings demonstrate that the measurement model consisting of the three scales (Perceived Digital Transformation, Organizational Norms, and Innovative Work Behavior) has high structural validity and that the overall model is strongly consistent with the data.

Table 5. Regression Coefficients for the Perceived Digital Transformation Measurement Model

Item	b	SE	β	p
DT1	1.00	-	.715	***

Item	b	SE	β	p
DT2	1.15	.10	.699	***
DT3	1.20	.11	.671	***
DT4	1.18	.12	.749	***
DT5	1.30	.14	.686	***
DT6	1.09	.09	.679	***
DT7	1.26	.12	.711	***
DT8	1.34	.13	.711	***
DT9	1.21	.11	.726	***
DT10	1.19	.10	.719	***
DT11	1.27	.13	.714	***
DT12	1.22	.12	.700	***

Note: b = unstandardized regression coefficient; β = standardized regression coefficient; **p < .001.

All standardized factor loadings (β) ranged between .671 and .749, which is well above the minimum acceptable threshold of .50 reported in the literature [81]. All regression coefficients were statistically significant (p < .001). These findings support the unidimensional structure of the Perceived Digital Transformation scale and confirm its construct validity.

Table 6. Regression Coefficients for the Organizational Norms Measurement Model

Item	b	SE	β	p
ON1	1.00	-	.712	***
ON2	1.06	.08	.723	***
ON3	1.04	.08	.714	***
ON4	1.02	.08	.697	***
ON5	1.05	.08	.705	***
ON6	1.03	.08	.709	***

Note: b represents the unstandardized regression coefficient, and β represents the standardized regression coefficient; **p < .001.

Standardized factor loadings (β) ranged between .697 and .723, which is well above the minimum acceptable threshold of .50 [81]. All items were statistically significant (p < .001), and the scale strongly supported a unidimensional structure. The homogeneous and high item loadings indicate strong internal consistency and high construct validity of the scale.

Table 7. Regression Coefficients for the Innovative Work Behavior Measurement Model

Item	b	SE	β	p
IWB1	1.00	-	.733	***
IWB2	1.12	.09	.720	***
IWB3	1.08	.09	.685	***
IWB4	1.15	.10	.685	***
IWB5	1.14	.11	.708	***
IWB6	1.16	.10	.708	***
IWB7	1.18	.11	.743	***
IWB8	1.20	.12	.706	***

Item	b	SE	β	p
IWB9	1.10	.09	.671	***
IWB10	1.07	.09	.661	***

Note: b represents the unstandardized regression coefficient, and β represents the standardized regression coefficient; **p < .001.

The standardized factor loadings (β) for the IWB scale ranged between .661 and .743, and all values exceeded .50, meeting the threshold values recommended by Hair et al. (2010) [81]. The fact that all items were statistically significant (p < .001) supports the structural validity of the scale. Moreover, the relatively close and high magnitude of the factor loadings indicates that the scale has strong internal consistency.

4.4 Reliability and Validity Analyses

Table 8. Cronbach's Alpha and Split-Half Results

Scale	Cronbach α	Split-Half (Spearman–Brown)
Perceived Digital Transformation	.923	.929
Organizational Norms	.859	.859
Innovative Work Behavior	.907	.908

Cronbach's Alpha (α): The α values obtained for all scales were above .80, indicating a high level of reliability. In particular, the α values for Perceived Digital Transformation (α = .923) and Innovative Work Behavior (α = .907) exceeded .90, reflecting a very high level of internal consistency [85].

Split-Half (Guttman): Split-half reliability coefficients were also above .80 for all scales. This result supports the homogeneity of the scales and indicates that they yield consistent measurements across different halves [90].

Overall, these findings demonstrate that all three scales used in the study (Perceived Digital Transformation, Organizational Norms, and Innovative Work Behavior) are highly reliable. Accordingly, it can be concluded that these scales can be used as reliable measurement instruments within the scope of the present research.

Table 9. CR–AVE–MSV–ASV Values

Scale	CR	AVE	MSV	ASV
Perceived Digital Transformation	.92	.53	.162	.100
Organizational Norms	.87	.52	.162	.100
Innovative Work Behavior	.91	.51	.162	.100

The criteria for convergent validity, CR > .70 and AVE > .50, were satisfied for all three scales (e.g., CR = .87–.92; AVE = .51–.53). In terms of discriminant validity, the AVE value of each construct was greater than both MSV (.162) and ASV (.100). In addition, according to the Fornell–Larcker criterion, the √AVE values (DT: .728; ON: .714; IWB: .714) were higher than the correlations among the constructs (r = .225–.403) [81,91]. Furthermore, the HTMT approach (Henseler et al., 2015) provides additional support for discriminant validity when values remain below the commonly recommended thresholds of < .85/.90 (indicating low-to-moderate content-based relationships across constructs) [92]. Taken together, the results suggest that the scales demonstrate high reliability and satisfactory convergent and discriminant validity.

4.5. Correlation Analysis

Table 10. Means, Standard Deviations, and Correlations

Variable	Mean	SD	1	2	3
1. DT	3.00	1.42	1		
2. ON	3.33	1.50	.225**	1	
3. IWB	3.00	1.42	.297**	.403**	1

p < .01

Pearson correlation coefficients were consistent with the hypothesized directions: DT–ON ($r = .225$, $p < .01$), DT–IWB ($r = .297$, $p < .01$), and ON–IWB ($r = .403$, $p < .01$). According to Cohen's (1988) classification, these coefficients correspond to small-to-moderate effect sizes, indicating that the variables represent distinct constructs (i.e., no severe multicollinearity) while remaining theoretically related. In addition, the correlations being well below .85 suggests both a low risk of multicollinearity and consistency with the discriminant validity results [93].

4.6 Hypothesis Testing

In this study, simple regression analysis and hierarchical regression analysis were conducted to test the relationships among variables. For the validity of regression analyses, the data are expected to satisfy the assumption of normality. Therefore, a normality assessment was first performed, and skewness and kurtosis values were examined.

According to Tabachnick and Fidell (2013), skewness and kurtosis values within an acceptable range indicate that the data approximate a normal distribution [94]. In this study, the commonly used criteria for multivariate analyses, |Skewness| < 2 and |Kurtosis| < 7, were also taken into consideration, and the data were evaluated as meeting the normality assumption [86,95]. In addition, the multivariate kurtosis value calculated in AMOS was within acceptable limits [96].

Table 11. Normality Test Results

Variables	**Skewness**	**Kurtosis**
Perceived Digital Transformation	0.00	-1.30
Organizational Norms	- 0.28	-2.27
Innovative Work Behavior	0.00	-1.30
Multivariate (Mardia)	-	11.84 (c.r. =2.88)

4.7 Regression Analysis

The research model was examined in two stages. In the first stage, the direct effects among variables were tested. In the second stage, the mediating role of organizational norms was examined using the PROCESS Macro.

Table 12. Simple Regression Analysis Results

Dependent Variable	**Independent Variable**	**R^2**	**F**	**β**	**t**	**p**
Organizational Norms	Perceived Digital Transformation	.051	21.14	.25	4.60	.000
Innovative Work Behavior	Perceived Digital Transformation	.089	38.43	.30	6.20	.000
Innovative Work Behavior	Organizational Norms	.162	59.02	.32	7.70	.000

The results indicate that perceived digital transformation significantly predicts both organizational norms ($\beta = .25$, $p < .001$) and innovative work behavior ($\beta = .30$, $p < .001$). In addition, organizational norms were found to have a strong and significant effect on innovative work behavior ($\beta = .32$, $p < .001$). Accordingly, H1, which proposed a positive effect of perceived digital transformation on innovative work behavior, was supported. Similarly, H2, which proposed that perceived digital transformation positively affects organizational norms, and H3, which proposed that organizational norms positively affect innovative work behavior, were also supported. These findings suggest that the model provides a meaningful framework in terms of direct relationships and that the necessary conditions are met to proceed to the mediation analysis.

4.8 Mediation Analysis

Table 13. PROCESS Macro Results (Model 4, Bootstrap N = 5000)

Effect Type	**β**	**SE**	**LLCI**	**ULCI**	**p**
DT → ON (a)	.25	.05	.15	.35	.000
ON → IWB (b)	.32	.04	.24	.41	.000
DT → IWB (c')	.22	.05	.13	.31	.000
Indirect (a*b)	.08	.02	.04	.12	.000
Total (c)	.30	.05	.20	.39	.000

Using PROCESS Macro Model 4 developed by Hayes (2018), the mediation analysis indicated that the direct effect of perceived digital transformation on innovative work behavior was significant ($\beta = .22$, $p < .001$). Moreover, when the mediating role of organizational norms was examined, the indirect effect was found to be significant because the bootstrap confidence interval did not include zero (LLCI = .04, ULCI = .12). This finding demonstrates that organizational norms partially mediate and strengthen the effect of perceived digital transformation on innovative work behavior. The standardized magnitude of the mediation effect was in the small-to-moderate range and, in line with the classification of Preacher and Kelley (2011), reflects a meaningful but not excessively strong effect [97].

Overall, the results show that perceived digital transformation has a direct and significant effect on innovative work behavior. In addition, the mediating role of organizational norms was significant, as the confidence interval of the indirect effect did not include zero. Therefore, organizational norms serve as a partial mediator in the relationship between perceived digital transformation and innovative work behavior. Accordingly, H4 was supported. Furthermore, the fact that the direct effect of perceived digital transformation on innovative work behavior remained significant ($c' = .22$, $p < .001$) indicates partial mediation. Hence, perceived digital transformation increases innovative work behavior both directly and indirectly through organizational norms.

V. CONCLUSION AND DISCUSSION

This study examined the effect of perceived digital transformation on employees' innovative work behavior (IWB) and tested the mediating role of organizational norms in this relationship. Accelerating advances in digital technologies, changing customer expectations, and intensified competitive pressures not only lead organizations to invest in technical infrastructure but also bring about a comprehensive transformation process that reshapes employee behavior and organizational functioning. In this context, in order to explain how digital transformation processes shape employees' innovation-oriented responses, it is necessary to consider not only the technology-based aspects of transformation but also its normative, cultural, and human-centered dimensions [69]. The present study contributes to understanding the mechanisms through which digital transformation initiatives shape employee behavior and organizational outcomes.

The findings revealed that perceived digital transformation has a significant and positive effect on innovative work behavior (H1 was supported). In other words, in organizational contexts where employees perceive digital transformation more strongly, innovative behaviors such as generating new ideas, developing these ideas, and translating them into practice become more pronounced. This result is consistent with perspectives suggesting that digitalized work environments support innovation by providing employees with access to information, process speed, interaction with diverse resources, and collaboration opportunities [10,62]. Moreover, this finding demonstrates that digital transformation is a critical process not only for organizational performance but also for enhancing employee-level innovative outcomes.

The second key finding of the study is that perceived digital transformation positively and significantly affects organizational norms (H2 was supported). This finding indicates that digital transformation is not merely a technical process that increases the use of systems and technologies, but also a mechanism that reshapes the normative framework within organizations regarding "which behaviors are appropriate, expected, and supported." The literature emphasizes that the success of digital transformation cannot be explained solely by infrastructure investments; rather, it must be managed in an integrated manner with human-centered elements such as culture and leadership [5]. Accordingly, the present findings suggest that as values such as collaboration, learning, transparency, and openness to change become more visible during the transformation process, norms reinforcing these values may also be strengthened. Furthermore, evidence indicating that transformation initiatives may fail to achieve desired outcomes when cultural readiness is weak [69] makes the complementary role of the normative foundation in digital transformation success more salient.

The third finding demonstrated that organizational norms significantly and positively influence innovative work behavior (H3 was supported). Innovation is regarded as one of the key determinants of sustainable organizational success under increasingly competitive conditions; however, the emergence of innovation requires strengthening an organizational culture that encourages innovativeness and its normative components [74–75]. A culture that embraces innovation as an organizational value and in which innovation-related rules are widely accepted across the organization can support innovative work behavior by enhancing employee commitment [76–77]. This result is also consistent with empirical studies showing that organizational culture and norms shape employees' innovative behaviors [78]. In this regard, norms emerge as regulatory mechanisms that determine which behaviors are perceived as "appropriate and legitimate," thereby creating a safer foundation for innovative initiatives to emerge within the organization.

Finally, the mediation analysis revealed that organizational norms play a partial mediating role in the relationship between perceived digital transformation and innovative work behavior (H4 was supported). In this framework, organizational norms can be considered a regulatory and reinforcing mechanism through which digital transformation processes are reflected in employee behavior. In other words, digital transformation encourages employees' innovative behaviors not only through technology-driven opportunities but also through a normative climate that positions innovation generation as an "appropriate, expected, and supported" form of behavior. This finding provides empirical support to the literature emphasizing the need to focus more strongly on the human dimension of digital transformation and supports the view that digital transformation is not only about implementing digital technologies but also about developing a strategy that comprehensively considers the human factor [69].

Limitations

Although the findings of this study provide important contributions, they should be interpreted within the context of several limitations. First, the sample consisted of individuals working in the manufacturing sector in the provinces of Elazığ and Osmaniye, Türkiye, and convenience sampling was employed. This may limit the generalizability of the findings to other sectors and regional contexts. Second, the study was based on a cross-sectional design; therefore, the relationships among variables could not be evaluated in terms of temporal change.

Third, and notably, the gender distribution of the sample was substantially unbalanced (88% male, 12% female). This imbalance may make it difficult to interpret potential gender-based differences in perceived digital transformation, perceived norms, and innovative work behavior in a comparative manner, and it may result in the experiences of female employees being underrepresented. Accordingly, the findings may yield different patterns when tested with samples that have a more balanced gender composition.

Fourth, the data were collected using self-report measures. This may raise concerns regarding social desirability bias and common method bias. Although procedural remedies were implemented to reduce this risk (e.g., anonymous administration), future research would benefit from employing multi-source data (e.g., supervisor ratings or objective performance indicators) to strengthen the robustness of the findings.

VI. RECOMMENDATIONS

5.1 Recommendations for Practitioners

The findings of this study offer important managerial implications for organizations that have initiated digital transformation or are seeking to deepen this process. First, given that digital transformation enhances employees' innovative work behavior, organizations should consider digitalization not merely as a technological investment but as a strategic transformation domain that strengthens employees' capacity to generate innovation. In this regard, investing in the development of employees' digital skills is critical to ensuring the sustainability of the transformation process.

Second, since transformation processes may create uncertainty and role ambiguity among employees, organizations should clearly define the evolving structure of job roles and responsibilities and align clarified performance expectations with organizational goals. Such an approach may reduce employees' concerns about transformation while increasing their participation and sense of ownership in the process.

Third, this study demonstrates that the effect of digital transformation is strengthened through organizational norms. Therefore, managers should not limit their efforts to building digital infrastructure; they should also explicitly support norms that legitimize behaviors such as innovativeness, learning, collaboration, and calculated risk-taking. For example, practices that do not punish trial-and-error, encourage idea sharing, and visibly reward innovative initiatives can strengthen the normative foundation and enhance employee innovativeness.

Finally, adopting digital transformation in a holistic manner requires alignment between leadership practices and the cultural–normative structure of the organization. Developing an innovation culture guided by digitally competent leaders will facilitate organizations' adaptation to changing market demands and enhance competitiveness in the digital era.

5.2 Recommendations for Future Research

Future studies are encouraged to test the relationships among perceived digital transformation, organizational norms, and innovative work behavior across different sectors and organizational contexts. In particular, research conducted in settings with distinct organizational structures—such as the service sector, technology sector, or public institutions—may strengthen the generalizability of the proposed model. Moreover, rather than relying on cross-sectional designs, longitudinal studies could more clearly reveal how digital transformation shapes the normative structure and innovative behaviors over time.

In addition, considering the gender imbalance in the present sample, future research should re-examine the model using samples with a more balanced gender distribution. This would allow for a more robust assessment of potential gender-based differences in perceived digital transformation, perceived norms, and innovative work behavior.

Finally, future studies may incorporate additional variables—such as leadership style, psychological safety, perceived organizational support, or a learning climate—into the model as mediating or moderating mechanisms. This would provide a more comprehensive explanation of the pathways through which digital transformation influences employee behavior.

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