



Role of Digital Leadership Capability in Shaping IT Innovation: A Digital Agility Perspective


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ABSTRACT

The digital era has reshaped business, where IT innovation is pivotal for success. Digital leadership is a key driver, leading to digital agility. However, the research on digital agility is still at a nascent stage. The authors used the dynamic-capabilities to examine the impact of digital leadership on IT innovation in business organizations. A survey of 250 US based IT professionals was analyzed using process macro. The findings of this study enrich the digital-leadership literature, emphasizing the crucial role of digital leadership and inter-team coordination in promoting IT innovation in organizations. Practical implications of the study stress the need for organizations to develop digital leadership while fostering knowledge integration and inter-team coordination.

KEYWORDS

Digital Agility, Digital-Leadership Capability, Innovation, Inter-Team Coordination, Knowledge-Integration Capability, Moderated-Mediation Model, Talent Management

INTRODUCTION

Digital agility has emerged as a competency that is currently being chased by organizations and leaders regardless of industrial or geographical boundaries. By targeting digital agility, leaders are converting their organizations into future-ready workplaces that can leverage the unlimited benefits of technology (Sia et al., 2021). But digital agility as a strategic endeavor must not be limited only to top management or leaders. For an organization to reap the benefits of digital transformation, equal and significant efforts are required at the subordinate, supervisor, and organization levels (Zhao et al., 2023). Establishing a digital culture that encourages and promotes digital responsiveness is also

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regarded as important for digital agility (Grover, 2022). Such an integrated investment of efforts and resources toward digitization is hailed as the need of the hour for businesses in order to remain competitive during turbulent times. Additionally, digital agility helps organizations respond to difficult situations by enhancing the firm's innovation capabilities (Peng & Tao, 2022).

Real-life business organizations provide tangible examples of the significance of digital agility. For instance, one exemplary company that has embraced digital agility is Apple Inc., a Fortune 500 company renowned for its innovative products and digital ecosystem. Apple's commitment to digital transformation, led by visionary leaders such as Steve Jobs and Tim Cook, has allowed the company to consistently adapt to technological advancements and changing market demands. Through continuous innovation and investment in digital capabilities, Apple has established itself as a global leader in the technology industry. Another notable example is Amazon.com, Inc., a Fortune 500 company that has revolutionized the retail landscape with its digital agility. By leveraging advanced technologies and data analytics, Amazon has transformed the way people shop and has disrupted traditional brick-and-mortar retail models. Its ability to swiftly adapt to customer preferences, optimize logistics, and personalize the shopping experience has propelled Amazon to become a global e-commerce giant.

In this study, we examine how digital leadership capability (DLC), an essential component of digital agility (Mishra et al., 2023; Benitez et al., 2022), interacts with knowledge-integration capability (KIC) (Del Giudice et al., 2021; Sjödin et al., 2020) and inter-team coordination (ITC) (Xie et al., 2022) to impact information-technology innovation (IIN) at the organization level. This intricate interplay among these elements holds immense importance for both management research and practice, as recent studies (Xie et al., 2022) have highlighted the need for further investigation into the relationship between digital agility and innovation.

Digital leadership and digital-leadership capability may be misconstrued as similar constructs; however, they are different from each other. Digital leadership is a mix of digital, strategic, business, and market leadership skills (Kane et al., 2019). These digital leaders (synonymous with managers) are key decision-making professionals who possess the combined skill sets of business and information technology (IT) (Weill & Ross, 2009). These leaders may come from a management or IT background; nonetheless, they fully acknowledge the importance of synergy between business and technology (Sia et al., 2016). Digital leaders motivate both digitally abled and digitally challenged workforces to be a part of digital transformation. Hence, digital leadership is usually an individual's leadership skill. On the other hand, digital-leadership capability is a firm-level ability to utilize and capitalize the unique skills of digital leaders in order to achieve digital agility and transformation (Hüsing et al., 2015). Hence, digital-leadership capability is an organization-level dynamic capability.

Through digital-leadership capability, organizations can initiate steps in the direction of successful adoption of technology in day-to-day business. Therefore, digital-leadership capability can be understood as paramount for digital transformation in modern-day organizations (Abbu et al., 2022). Due to the potential impact of developing this capability, organizations must channelize their skills and expertise into different domains to drive digital transformation. This digital-leadership capability can prove to be of prime significance in achieving organizational goals during challenging times. Digital-leadership capability positively impacts the innovation performance of the firm due to the timely application of IT infrastructure (Gupta, Hassan, Pandey & Kushwaha, 2021; Benitez et al., 2022). When digital leaders' skills are appropriately put to practice, they are motivated to get the entire workforce onboard with the technological infrastructural changes (Chatterjee & Kar, 2018). Digital-leadership capability also enhances the positive impact of employees' digital performance on organizational performance (Chatterjee et al., 2023). Focusing on the influence of digital leaders on the IT infrastructure of the firm, this study proposes a positive impact of digital-leadership capability on IT innovation mediated by inter-team coordination. The authors also examine the moderating effect of KIC on the relationship between digital-leadership capability and IT innovation.

Since digital-leadership capability literature is in a nascent stage, not much is known about the antecedents and implications of such capabilities on organizational performance, including innovation.

Our study aims to make a strong contribution to this emerging research area by addressing the following research gaps. First, digital-leadership capability is a necessary organizational characteristic and a core component of digital agility; however, due to scarce and limited literature, the accurate potential of this capability has not been unveiled. Only a few studies have tested the effect of digital-leadership capability (e.g., Benitez et al., 2022; Cahyadi & Magda, 2021; Chatterjee et al., 2023; Khaw et al., 2022). Our study will further uncover the role of digital-leadership capability in IT innovation. Second, this research aims to respond to future research suggestions given by Appio et al. (2021) that focus on how digital transformation influences co-creation and collaboration among individuals working across different levels. Our study examines the effect of collaborative actions through knowledge-integration capability (within the team) and team coordination (among the teams) on the digital-leadership capability–IT innovation relationship. Third, digital leadership and digital-leadership capability are interrelated but different constructs. Despite a clear distinction, digital-leadership capability often gets misinterpreted as digital leadership. Through this study, the researchers aim to further highlight the interpretation and distinct role of digital-leadership capability in workplace settings.

The current study aims to examine the following research questions: (1) What is the impact of digital-leadership capability on IT innovation? (2) What is the impact of inter-team coordination on the relationship between digital-leadership capability and IT innovation? (3) What is the effect of knowledge-integration capability on the relationship among digital-leadership capability, inter-team coordination, and IT innovation?

LITERATURE REVIEW

Digital Agility

Fast-paced digitalization creates a set of never-seen-before opportunities as well as challenges with an added flavor of uncertainty. Uncertainty is not new for businesses; however, digitalization has resulted in an intense uncertainty in the global market (Bogers et al., 2018). Hence, organizations need to be able to respond carefully yet swiftly to these newer market conditions before their competitors does. This ability has been termed digital agility. Digital agility has been defined as “the capability of an organization to capitalize on opportunities/threats induced by generative digital technologies under constrained or unfolding time frames” (Salmela et al., 2022, p. 1081).

Digital agility does not have a binary status; rather, it ranges from low to high on a wide spectrum. Organizations high on digital agility are able to capitalize on the digital technology available to them in order to reap maximum benefits in a changing market environment. Digital agility is an organization-level capability; however, building this capability requires integrated efforts from employees, teams, managers, and structures (Baiyere et al., 2020; Svahn et al., 2017). In addition to these enablers, Grover (2022) suggests four tenets of building digital agility, i.e., digital capabilities packaging, developing digital ecosystems, utilization of data for efficiency, and building a digital culture. Digitally agile organizations develop modular capabilities so that they can be combined and integrated to respond to opportunities. Developing digital ecosystems consists of designing and implementing digital infrastructure that promptly provides a platform for the capabilities to work together. The third tenet, data, needs to be at the center of decision-making and problem-solving. And last, digitally agile organizations focus extensively on creating a “digital-first” mindset that has innovation as the desired end goal (Grover, 2022).

Digital Agility and Digital Leadership: A Timely Research

The modern world, which is characterized by its volatility, uncertainty, complexity, and ambiguity (VUCA), presents organizations with a variety of difficulties that go beyond typical business conventions. This environment’s dynamics call for a new viewpoint that recognizes the potential of digital solutions to fend off the disruptive forces at work. Digital platforms and capabilities have

become dynamic tools that can successfully handle the numerous challenges created by the VUCA landscape (Troise et al., 2022). The idea of digital leadership has become more well-known in this environment. Beyond traditional leadership paradigms, digital leadership involves a holistic strategy that uses technology to help organizations navigate complex webs of uncertainty rather than just as an enabler (Weber et al., 2019). Digital leadership is fundamentally a proactive mentality that welcomes change and promotes experimentation. This innovative strategy promotes a culture of ongoing learning and flexibility throughout an organization in addition to implementing the most recent technical advancements (Chatterjee et al., 2023). Businesses can develop digital agility by fostering this mentality, which gives them the flexibility to react quickly and effectively to shifting market dynamics, consumer preferences, and competitive threats.

Digital leadership becomes essential to the success of businesses as they begin their journeys of digital transformation. This leadership paradigm encapsulates collaboration and engagement at all organizational levels, not just top-down decision-making (Tigre et al., 2023). An organization's capacity to not only survive but also prosper in a VUCA world can be significantly influenced by research that explores the complex interactions between digital leadership and agility. Hence, it is vital to respond in a timely manner to the calls for research on digital leadership and agility. Understanding the symbiotic relationship between effective leadership and technological adaptation is crucial given how quickly technology is developing and how the digital ecosystem is constantly altering corporate conventions. Organizations that do not recognize the importance of this synergy run the danger of falling behind in a digitally driven and increasingly competitive environment (Grover, 2022). The road to strategic digital integration, strengthened leadership techniques, and finally long-term organizational success is illuminated by contemporary research in this field.

Theoretical Framework

According to the dynamic-capabilities view (DCV) of the firm, how a firm senses market changes, seizes newer opportunities, and adjusts its internal capabilities and resources in response to those changes is what ultimately gives it a sustained competitive advantage (Teece, 2007; Teece et al., 1997). The DCV emphasizes how crucial it is for an organization to continuously innovate, learn, and adapt in order to succeed in challenging and changing business settings. Three interconnected components make up this framework: sensing, which entails spotting external changes and trends; seizing, which involves grasping these chances; and reconfiguring, which involves modifying or developing new internal capabilities (Teece, 2007). Overall, the dynamic capabilities perspective acknowledges that maintaining a competitive edge in today's environment of rapid change requires the ability to evolve and transform.

The firm's DCV sheds light on the complex interrelationships among digital-leadership capability, inter-team coordination, and IT innovation. Dynamic capabilities are characterized as taking the right steps at the right time (Teece, 2014). Becoming digitally agile requires creating and effectively utilizing digital leaders across the organizational hierarchies. This digital leadership capability is understood as an organizational skill to conceptualize and strategically direct digital initiatives through digital leaders (Benitez et al., 2022). This entails seeing upcoming digital trends, selecting technological investments wisely, and fostering a climate that encourages innovation (Kane et al., 2019). By encouraging collaboration among various teams across the organization, inter-team coordination is essential for turning strategic visions into concrete results (Brunner et al., 2023). Sharing knowledge, coordinating resources, and ensuring smooth deployment of cutting-edge IT solutions are all benefits of effective coordination. The dynamic-capabilities framework's ideas of sensing market changes, grabbing opportunities, and reorganizing internal processes are all in line with this coordination. Together, these dynamic capabilities give businesses the ability to stimulate IT innovation, continuously adapt to the changing digital landscape, and maintain a competitive advantage over time.

HYPOTHESES DEVELOPMENT

The DCV of the firm indicates that organizations should be able to reroute their efforts in order to develop new capabilities to sustain and grow in a continuously changing environment (Teece et al., 1997). In today's context, a dynamic capability can be understood as the firm-specific endeavor to sense, seize, and transform a capability that provides the firm a competitive edge (Khan et al., 2020a and 2020b). As the world witnesses growing dependence on technology, digital-leadership capability emerges as a dynamic capability for the organization to excel at tech-enabled business.

In the age of constant disruptions, organizations need to invest continuously in building digital-leadership capability among their workforce. Digital leaders not only introduce a transformative vision to the employees, they also bring about forward-looking strategic shifts that benefit the organization (Kane et al., 2019). Digital leaders have the dynamic capability to promptly identify and seize opportunities to achieve tech-driven innovation (Teece, 2007). In addition to technical expertise, digital leaders act as the bridge between technology and business. Such leaders play a key role in understanding the business needs and identifying the technological infrastructure needed to perform those business activities (Sia et al., 2016). Thus, an organization that develops digital-leadership capability experiences enhanced IT-innovation possibilities.

A recent study suggests that leaders with a sound understanding of technology play a vital role in digitizing organizational systems and activities, which in turn enhances the innovation performance of the firm (Benitez et al., 2022). Leaders have the capability and positional power to influence the approach of the employees and motivate them to be more digitally literate. In addition to digitization of the workplace, digital-leadership capability has also been identified to impact employees' work-life balance and performance (Chatterjee et al., 2023). By creating a technically advanced and healthy workplace, digital-leadership capability helps in channeling the leaders, followers, and organizational resources to their goals in a meaningful way (Khaw et al., 2022). Bass (1985) suggested that such efforts from the leaders motivate the employees to enhance their skill sets regarding digital systems and contribute to innovation. Digital-leadership capability allows leaders to invest their time and efforts in identifying how new technology can enhance employees' performance and help them innovate (Mihardjo et al., 2019). With their technological understanding, digital leaders also focus on the human element of the workforce, since they would be the primary users of the technological infrastructure. Previous studies have identified the strong influence of leaders on employees' perceived usefulness of information technology at work (e.g., Hickman & Akdere, 2017; Shao, 2019). Organizational leaders are found to have the ability to inspire individuals to be active agents of digital change through IT innovation (Bunjak et al., 2022). When leaders are equally focused on innovation and smooth functioning of day-to-day business, the innovation potential is maximized (Rosing et al., 2011). Considering the positive impact of leadership on IT innovation, we hypothesize the following.

Hypothesis One: Digital-Leadership Capability Is Positively Related to IT Innovation

The pandemic and rapidly advancing technology have created a strenuous situation for leaders since digital transformation has become a necessity for organizations; however, such large-scale changes are often not welcomed by the employees (Alvesson & Sveningsson, 2015). Developing digital-leadership capability depends heavily on acknowledging the role of people in accepting and promoting digital transformation. Therefore, effective leaders strive to get people actively involved with the change process (Hussain et al., 2018).

One of the most significant changes faced by working professionals recently has been the shift from traditional to virtual modes of working. However, individuals have not been able to cope with this transition due to lack of role clarity and knowledge of resources (Liao, 2017). Digital-leadership capability can act as a solution to this potential crisis. Weber et al. (2019) propose a novel framework for digital leadership where they identify "networker" as one of the key roles played by current-day

leaders. As networkers, digital leaders not only establish strong connections with their followers, they also encourage team members to work in a cohesive manner. In a virtual work environment, relationship-oriented leaders have been observed to positively induce team cohesiveness to increase the pace of digital transformation (Bartsch et al., 2020). Drawing from the dynamic-capabilities view, organizations with digital-leadership capability are able to establish effective domestic and global networks among employees to ensure smooth coordination and collaboration (Mihardjo et al., 2019). Digital-leadership capability helps the organization in encouraging the employees to seek internal and external coordination and collaboration (Chen, 2022; Eberl & Drews, 2021).

Hypothesis Two: Digital Leadership Capability Is Positively Related to Inter-Team Coordination

To examine the effectiveness of leadership in digital transformation, the authors take theoretical support from leadership theories (Bass, 1985) that argue that organizational leaders possess the ability to channelize teams by influencing and inspiring them to contribute to a common goal with fewer conflicts (Stollberger et al., 2022). It is believed that leaders with digital capabilities can create a shared vision and communicate it with clarity. This enables a smooth coordination among teams responsible for distinct yet interdependent functions. By facilitating coordination and collaboration among teams, digital leaders inspire the members to join hands in pursuing a common organizational goal (O'Reilly & Chatman, 2020). A study suggests that, under the guidance of organizational leaders, coordination among organizational units allows teams to quickly identify, gather, and share new knowledge avenues and thus better coordinate among themselves (Ruiqian et al., 2022). Hence, organizations that foster and effectively utilize multidimensional skills of digital leaders are more likely to observe coordination and collaboration among teams at the workplace.

People are the core element of any activity designed to achieve organizational goals (Kohli & Melville, 2019). The organization may employ the most advanced technology and infrastructure at the workplace; however, the efforts may still go in vain without enthusiastic participation from the workforce. On the other hand, when individuals are encouraged to have iterative coordination among themselves, the teams can deliver valuable and innovative performance (Ghosh & Wu, 2021).

Organizations and leaders desire to foster a workplace environment that motivates employees to attempt innovative methods and practices. Mattarelli et al. (2022) have focused on characteristics of teams and concluded that team coordination is among the most effective practices required for innovation in product development. More efforts to coordinate among team members have been shown to help them produce high quality and complex ideas and suggestions (Agrawal et al., 2018). Such enhanced knowledge-sharing among teams and individuals has been found to lead to technology-driven innovation (Bagherzadeh et al., 2019). Furthermore, when individuals and teams are encouraged to exchange knowledge internally, they are more likely to deliver tech-enabled innovation (Bunjak et al., 2022).

As the pandemic and increased competition have added complexities to all kinds of businesses, knowledgeable and tech-enabled teams have emerged as a defining element for IT innovation. According to complex adaptive systems theory (Holland, 1996), today's organization can be seen as a complex system that has interconnected teams as a core component. In the time of nonlinear and unpredictable external forces, interdependent teams have the ability to act in an adaptive and coordinated manner in order to leverage technology for innovation.

Hypothesis Three: Inter-Team Coordination Is Positively Related to IT Innovation

As researchers have established that digital-leadership capability is positively related with IT innovation and that inter-team coordination is positively related with IT innovation, we argue in favor of the mediating role of inter-team coordination for the relationship between digital-leadership capability and IT innovation. Our argument is based on the fact that digital leadership has been considered as a determinant of inter-team coordination in recent empirical research (e.g., Aldawood

et al., 2019; Benitez et al., 2022; Navaridas-Nalda et al., 2020). These studies highlight the role of digitally capable leaders in facilitating information exchange and knowledge-sharing among teams and people. While the pandemic forced individuals to enhance their usage of digital platforms and technology to coordinate, digital leaders helped them in doing so by carefully communicating the process and outcome of digitization (Zhong, 2017). Similarly, recent empirical studies have identified inter-team coordination as an antecedent for IT innovation (e.g., Hooijberg & Watkins, 2021; Lyytinen et al., 2016). Based on the findings of these studies, the authors argue for a mediating role of inter-team coordination between digital leadership capability and IT innovation.

Hypothesis Four: Inter-Team Coordination Mediates the Relationship Between Digital-Leadership Capability and IT Innovation

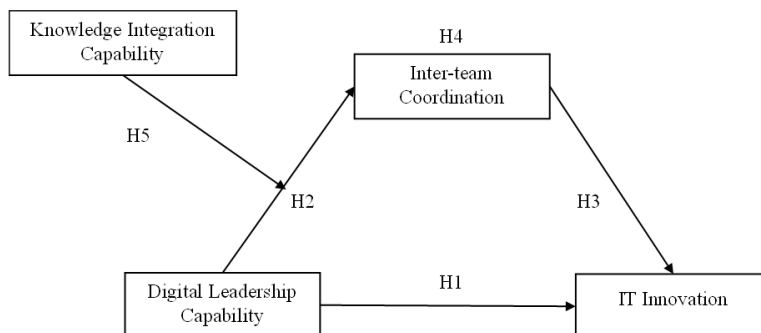
Knowledge has emerged as one of the most significant resources available to individuals for contributing to organizational and personal growth. However, knowledge is not equally held by all the members in a team (Zahra et al., 2020). Such uneven distribution and possession of knowledge call for integrative efforts from the team members. The ability of the team members to gather and absorb the knowledge held by specific team members is termed knowledge-integration capability (Gardner et al., 2012).

KIC enables the team members to utilize one another’s knowledge and skills. Teams with higher knowledge-integration capabilities tend to have more effective and successful knowledge-sharing among the members (Navimipour & Charband, 2016). In addition to accumulating internal knowledge of the team members, higher knowledge-integration capability helps team members to gather external knowledge more efficiently (Yu et al., 2022). Teams with higher knowledge-integration capability tend to be more effective in merging old knowledge with new knowledge in order to enhance their coordination and collaboration (Wang et al., 2018). Due to better coordination efforts, higher knowledge-integration capability leads teams to higher firm performance (Parente et al., 2022). Drawing from leadership frameworks (e.g., Bass, 1985) and complex adaptive systems theory (Holland, 1996), the authors present the argument for the moderating role of KIC on the relationship between digital-leadership capability and inter-team coordination. When team members have the regular tendency to integrate internal knowledge, they are motivated to practice enhanced inter-team coordination. Thus we hypothesize the following.

Hypothesis Five: Knowledge-Integration Capability Moderates the Relationship Between Digital-Leadership Capability and Inter-Team Coordination Such That When KIC is Higher, the Relationship is Stronger

The hypothesized model for the current study is indicated in Fig. 1.

Figure 1. Hypothesized model



METHODOLOGY

The study relied on a quantitative-survey approach for data collection and hypothesis testing. The approach is consistent with prior research (e.g., Nielsen & Mathiassen, 2013; Cummings & Kiesler, 2005) that has supported the reliance on the survey method to collect data on topics such as knowledge management, leadership, and digital agility). Before the beginning of the study, institutional ethical committee approval was secured from one of the authors' universities. Once the approval was received, a survey was floated among 350 respondents (Employed and above the age of 18) working in the IT industry in the United States. Respondents were approached through social-media platforms (such as LinkedIn and Facebook) and the professional alumni network of the authors' institutes. However, researchers received back only 264 completely filled survey forms after the second stage of data collection. Further examination of the filled surveys identified 14 unusable survey forms, as these participants had failed to provide appropriate responses to the attention-check question that was included as part of the survey form.

Survey questionnaires were designed using well-established measurements for the constructs. Responses were collected using a seven-point Likert scale. Digital-leadership capability was measured using a four-item scale from Benitez et al. (2022). Similarly, inter-team coordination was measured using a two-item scale previously used by Hoegl et al. (2004). The researchers measured knowledge-integration capability using a 10-item scale developed by Gardner et al. (2012) and Yu et al. (2022). IT innovation was measured using a seven-item scale developed by Sedera et al. (2016). The authors used age, gender, educational qualification, and technological experience as control variables consistent with previous studies on IT and leadership (Hoch et al., 2010; Rizzuto, 2011). The reliability of our scales was checked by conducting a pre-test with 11 respondents (Reis et al., 2017).

Data collection was done in two stages. In the first stage, demographic details and responses capturing the independent variables and mediating and moderating variables were collected. After a week, the same respondents were contacted for the second part of the study, in which they were asked to provide their responses against the statements on dependent variables (Kukreja & Pandey, 2023).

FINDINGS

We performed a series of confirmatory factor analyses (CFA) using AMOS 28 (Hair et al., 2012) and hypotheses testing using PROCESS macro (Hayes, 2017). Based on the CFA analysis, the results of convergent validity and internal reliability are presented. The researchers controlled for the common method bias by ensuring a temporal separation of one week between different stages. This temporal-separation period is consistent with prior studies and some recent research that suggests a temporal separation exceeding three days (Kukreja & Pandey, 2023; Hassan & Pandey, 2021). In addition to the temporal separation, Harman's single-factor test was also employed to check for common method variance and found that a single constrained factor explained less than 50% of the total variance. The descriptive statistics, including intercoder and reliability measures, have been indicated in Table 1.

Table 1. Descriptive statistics, reliability estimates, and study variable intercorrelation

	CR	AVE	MSV	1	2	3	4
1. Digital-Leadership Capability	0.918	0.739	0.533	0.860			
2. Knowledge-Integration Capability	0.917	0.553	0.500	0.610	0.744		
3. IT Innovation	0.909	0.587	0.533	0.730	0.619	0.766	
4. Inter-Team Coordination	0.786	0.649	0.500	0.668	0.707	0.603	0.805

Note: CR, composite reliability; AVE, average variance extracted; MSV, maximum shared variance.

Reliability was ensured through Cronbach’s alpha and composite reliability for all scales, and it was above 0.7, consistent with previous studies (Nunnally & Bernstein, 1994). Convergent validity was measured through average variance extracted (AVE), which was higher than 0.5 but less than 10. For the discriminant validity, the authors relied on the maximum shared variance (MSV) < AVE; the square root of AVE is greater than inter-construct correlations. The goodness of fit indicators result has been given in Table 2.

The mean, standard deviation, and bivariate correlations of the variables are given in Table 3. Prior to CFA, we tested for multicollinearity with the help of variance inflation factor (VIF) values. All VIF values have been observed to be less than 10, suggesting that our constructs do not have traces of multicollinearity (Myers, 1990). The CFA results have been indicated in Fig. 2.

The regression results have been indicated in Table 4. For the purpose of the analysis, Hayes’s PROCESS macro-Model 7 was tested. It was found that digital-leadership capability was found to be positively related to IT innovation ($b = 0.479, p < 0.001$); thus, Hypothesis 1 was supported. Similarly, Hypothesis 2 was supported ($b = 0.304, p < 0.001$). Hypothesis 3, the positive relationship between inter-team coordination and IT innovation, was also found to be supported ($b = 0.1511, p = 0.20$).

The interaction effect of digital-leadership capability and knowledge-integration capability was found to be a significant predictor of inter-team coordination ($b = 0.0982, p = 0.0073$), thus supporting the hypothesis on moderation effect. The relationship is stronger for higher degree/value for knowledge-integration capability. Both the direct and indirect effects of digital-leadership capability on IT innovation were found to be significant. The direct effect has been indicated in Table 5, and the indirect effect has been indicated in Table 6. In addition to this, the index of moderated mediation also suggested a moderated-mediation effect.

DISCUSSION

The digital world is exciting; however, successfully running a business in this world does not just require digitization. It requires identifying and responding to digital opportunities while dealing with digital

Table 2. Goodness of fit indices for the measurement model

Fit Indices	χ^2	df	SRMR	CMIN/df	TLI	CFI	RMSEA
Value	360.122	203	0.0380	1.774	0.950	0.956	0.056
Recommended Value			< 0.08	Less than 2 to 5	> 0.90	> 0.90	< 0.08

N = 250. χ^2 , chi squared; df, degrees of freedom; SRMR, standardized root mean square residual; TLI, Tucker Lewis index; CFI, comparative fit index; RMSEA, root mean square error of approximation.

Table 3. Validity analysis

Constructs	Mean	SD	1	2	3	4	5	6	7
1. DLC	4.6990	1.420	(0.918)						
2. ITC	4.840	1.394	0.555**	(0.778)					
3. KIC	5.148	1.053	0.565**	0.595**	(0.916)				
4. IIN	4.852	1.192	0.662**	0.495**	0.571**	(0.908)			
5. EQ	2.36	0.969	0.024	0.036	-0.032	0.061			
6. WE	1.67	0.697	0.021	0.032	0.079	0.024	0.103		0.883**
7. Age	38.30	10.224	0.072	0.047	0.103	0.053	0.170**	.072	

N = 250. Reliabilities are in the parentheses on this diagonal: ***p < 0.001, **p < 0.01, *p < 0.05. SD, standard deviation; DLC, digital-leadership capability; ITC, inter-team coordination; KIC, knowledge-integration capability; IIN, IT innovation; EQ, educational qualification; WE, work experience.

Figure 2. Confirmatory factor analysis results

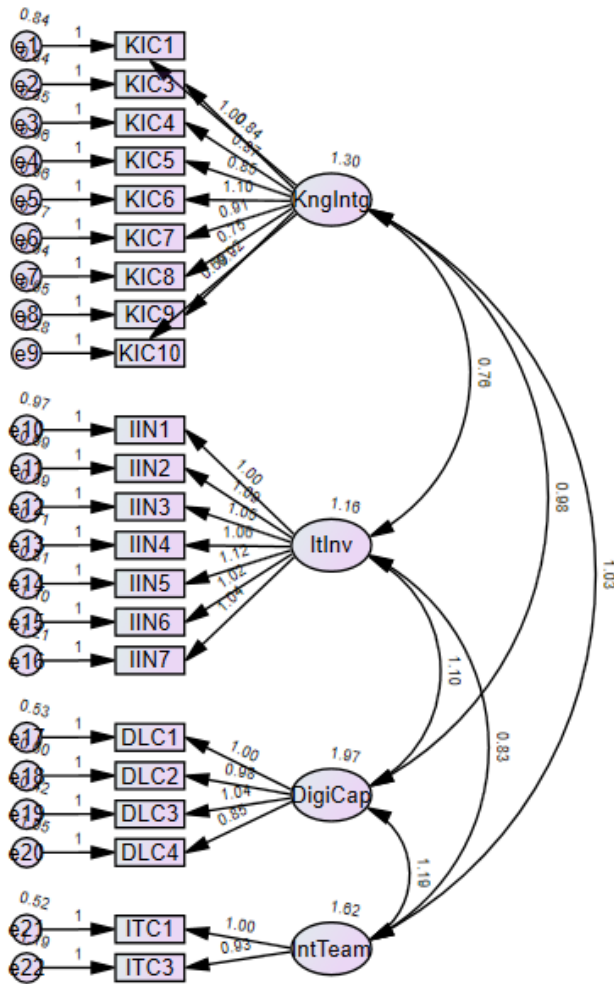


Table 4a. Regression results of mediation

Mediator Variable Model: Inter-Team Coordination (ITC)	<i>beta</i>	<i>se</i>	<i>t</i>	<i>p</i>
Constant	4.7632	4.7632	.3625	0.00
Digital-Leadership Capability (DLC)	0.3304	0.3304	0.0578	0.00
Knowledge-Integration Capability (KIC)	0.6223	0.6223	0.0821	0.16
DLC x KIC	0.0982	0.0982	0.0363	0.0073
Age	-0.0103	-0.0103	0.0142	0.26
Gender	0.1347	0.1347	0.1359	0.11
Work Experience	0.0060	0.0060	0.0146	0.72
Educational Qualification	0.0913	0.0913	0.0711	0.2001

N = 250, R -squared = 0.4465. F = 27.8852***

Table 4b. Regression Results for IT Innovation as Outcome Variable

Outcome Variable: IT Innovation (IIN)	<i>beta</i>	<i>se</i>	<i>t</i>	<i>p</i>
Constant	3.9950	0.3808	10.4907	0.00
Digital-Leadership Capability (DLC)	0.4793	0.0481	9.9589	0.00
Inter-Team Coordination (ITC)	0.1511	0.0484	3.1213	0.20
Age	-0.0039	0.119	-0.3230	0.7470
Gender	0.1289	0.1139	1.1321	0.2587
Work Experience	0.0036	0.122	0.2974	0.7664
Educational Qualification	0.0617	0.594	1.0381	0.2999

N = 250. R-squared = 0.4666. F = 35.4246***

Table 5. Direct effect of DLC on IIN

Effect	<i>se</i>	<i>t</i>	<i>p</i>
0.4793	0.0481	9.9589	0.0000

Table 6. Indirect effect of DLC on IIN

Indirect Effect	Effect	Bootstrap	BootLLCI	BootULCI
-1	0.0343	0.0179	0.0054	0.0750
<i>M</i>	0.0499	0.0215	0.0117	0.0964
+1	0.0656	0.0270	0.0157	0.1217

N = 250; BootLLCI, bootstrapping lower-limit confidence interval; BootULCI, bootstrapping upper-limit confidence interval

challenges. Such a competence can be developed by inculcating much-required yet understudied digital agility in the firm (Grover, 2022). Our study aims to extend the emerging research domain of digital agility.

Converting a traditional firm into a digitally agile firm is a Herculean task, since it involves changing old habits, beliefs, ways of working, and culture and moving into a more difficult yet promising environment. Despite the desperate need, organizations struggle to achieve successful digital transformation (Eden et al., 2019). One of the prime reasons for this failure can be attributed to lack of development of digital-leadership capability (Hüsing et al., 2015). Digital leaders can shoulder the responsibility of managing such a large-scale shift and become the primary agents of the change (Malodia et al., 2023). Identifying such change agents across hierarchical boundaries helps organizations in strategically planning, designing, and implementing digital transformation in order to ensure its success. This process requires choosing employees that have technological skills and converting them into digital leaders after thorough evaluation of their skills. This digital-leadership capability facilitates digital transformation and encourages agility for organizations (AlNuaimi et al., 2022; Stefanova & Kabakchieva, 2019).

Considering the potential impact of such organizational capability on multiple desirable outcomes, our study stresses the need to examine how digital-leadership capability can be instrumental for success in the digitally charged environment. Benitez et al. (2022) suggest that digital-leadership capability leads to organizational innovation performance via platform digitization capability of the firm.

Benitez et al. (2022) examined the relationship between digital-leadership capability and innovation mediated through a systematic capability. While the platform capability is indeed crucial, this study aims to identify how digital-leadership capability mobilizes the human efforts, i.e., coordination and collaboration, to eventually target IT innovation.

Focusing on the impact on employees, Chatterjee et al. (2023) identify a positive moderating role of digital-leadership capability on work-life balance and organizational performance. The current study examines the effect of digital-leadership capability on IT innovation in the presence of inter-team coordination and knowledge-integration capability of the firm. Drawing from the dynamic-capabilities view of the firm (Teece et al., 1997) and complex adaptive systems theory (Holland, 1996), the researchers hypothesized a moderated-mediation model focusing on digital-leadership capability and its impact on IT innovation. In order to differentiate from digital leadership, the authors measured digital-leadership capability following the suggestion of Benitez et al. (2022). Distinguishing from other digital or e-leadership scales, Benitez et al. (2022) focused on the organizational pursuit of strategic, business, and market skills in addition to the digital know-how of the leaders. The utilization of this combination of skills helps operationalize the digital-leadership capability of the firm.

Digital-leadership capability is a novel and different perspective on building a multidimensional firm-level strength that can differentiate the firm from the competitors. The results of this study help develop a theoretical understanding of how digital-leadership capability and coordination among individuals and teams are related within a digital-transformation context. The findings of our study are consistent with recent studies on digital-leadership capability (Benitez et al., 2022; Chatterjee et al., 2023) that suggest that when organizations strategically focus on developing and utilizing digital leadership, it impacts how individuals work and thrive, leading to organizational growth. The positive influence of digital-leadership capability on aspects such as organizational culture, collaboration, knowledge-sharing, and trust in teams may be of much interest to practitioners.

Organizations expect tech-driven innovations to be instrumental in solving complex business and market problems for them. Digital leaders bridge the gap between innovation and business requirements by clearly setting expectations, providing necessary resources, and re-evaluating the approach from a digital-agility perspective. Digital-leadership capability helps build leaders with a combination of business and technology know-how who are better equipped to introduce, sustain, and enhance technology usage in day-to-day business activities. Such leaders also encourage the teams to work in a coordinated manner that facilitates knowledge-sharing, which led us to hypothesize the mediating role of inter-team coordination on digital-leadership capability and IT innovation.

The findings of the current study are consistent with previous studies that suggested potential linkage between digital-leadership capability and relevant organizational-level outcomes such as digital readiness, competitiveness, and innovation (Benitez et al., 2022; Cahyadi & Magda, 2021). In addition to these outcomes, digital-leadership capability also plays an important role in making sure that teams and departments are working as a single unit, exploiting digital channels and resources in a coordinated fashion. Digital-leadership capability, through digital agility, propagates agile behavior in responsiveness among teams and departments. Moreover, how team members identify and fill the knowledge imbalances and gaps among themselves further empowers the impact of digital-leadership capability on inter-team coordination. Hence, digital-leadership capability can be a preventive mechanism against undesirable outcomes caused by unevenly distributed digital skills among team members (Gupta et al., 2022).

Theoretical Implications

Our study makes three significant contributions to theory and literature. First, our study addresses important research questions suggested by Appio et al. (2021) regarding the role of digital transformation on collaboration among individuals. The authors tested the relationship among digital-leadership capability, inter-team coordination, and IT innovation empirically. The researchers also employed a dynamic-capabilities view (Teece et al., 1997) and complex adaptive systems theory

(Holland, 1996) to build the hypothesized model. Our results indicate a mediating role of inter-team coordination between digital-leadership capability and IT innovation. Our study concludes that digital-leadership capability has the potential to bring different groups together on the same platform and move forward with continuous collaboration and knowledge exchange.

First, through this study, the researchers add to the limited understanding of digital-leadership capability (Benitez et al., 2022) and point toward the need for more rigorous research on it. Second, the researchers further the limited literature and understanding of the digital agility of organizations. Digital agility as an organizational characteristic is in the nascent stages of theoretical and practical understanding (Grover, 2022; Salmela et al., 2022). More studies are required to fully understand the potential of digital agility. Considering digitally agile firms as a complex adaptive system, our study examines digital-leadership capability (structure), knowledge-integration capability, and inter-team coordination (employee behavior) as components of digital agility (Salmela et al., 2022). Third, our study adds to the limited literature on the role of leadership in digital transformation. Few studies have examined how leadership impacts digital transformation and ensures digital agility (AlNuaimi et al., 2022; Kho et al., 2020).

Our study focuses on digital-leadership capability, a firm-level competence of bringing together digital leaders and utilizing their expertise to drive digital transformation. Digital-leadership capability helps the firm identify potential digital leaders and utilize them to bring transformational changes in organizational structure, managerial behavior, and employee behavior. This study highlights the need to develop deeper theoretical underpinnings of digital agility by creating a conceptual framework that may include constructs of this study.

Practical Implications

The study's findings provide several practical recommendations and implications for organizations. First, the findings suggest that the workforce's digital-leadership capabilities are critical for innovation. Thus, organizations must identify employees with extensive digital-transformation experience and position them as catalysts for the firm's transformation process. In addition, firms can also train their employees in the latest digital-literacy techniques through educational sessions with industry professionals in line with suggestions of Kane et al. (2019). Second, given the significance of inter-team coordination, businesses should establish open and transparent communication channels among their workforces. This would increase cross-functional collaboration, sharing of knowledge and ideas, and the development of a supportive organizational culture, thereby empowering the workforce and fostering innovation. Third, as knowledge-integration capability influences the efficacy of digital-leadership capabilities on inter-team coordination, businesses must adapt their digital-leadership capabilities in accordance with contextual factors, as a one-size-fits-all approach may not be feasible. The workforce may have the required digital-agility skills but may vary in its contextual factors due to the industry, the organizational team structure, and geographical or cultural aspects. Therefore, it would be critical to implement transformation while considering these factors as well. Fourth, Schräge et al. (2022) observed that digital transformation is often confused for the end goal instead of the means to achieve the end goal and is frequently measured through counterproductive KPIs. Our research addresses this gap by proposing a method by which digital agility can be accessed in terms of DLC, ITC, and KIC support for IT innovation.

LIMITATIONS AND FUTURE RESEARCH

Although the present study contributes extensively to the digital agility and innovation domain, it still has some nonfatal limitations, which provides opportunities for future studies. First, the current study is cross-sectional, which limits the establishment of causal interpretations and definitive generalizations regarding DLC, ITC, IIN, and KIC. An experimental design or longitudinal study over extended periods, considered extremely worthwhile, would consolidate the results and further note

the leaders' behavioral shifts. Second, since our respondents belong to the IT industry of a developed country, the United States, the generalizability of the findings across different economies may be limited. While the results may be generalized to developed and tech-intensive countries, studies on IT industries have often reported concerns of generalizability between developed and developing economies (see Ali et al., 2020; Molla & Licker, 2005; Rajae Harandi & Abdolvand, 2018; Wu et al., 2017). Hence, future studies to verify the applicability of the findings of this study to developing and emerging economies having diverse social, cultural, and political environments are advised. Third, due to the self-reported nature of respondent data, the threat of the common method bias (CMB) cannot be ignored despite researchers taking measures to mitigate it. A temporal separation exceeding three days in line with Kukreja & Pandey (2023) was undertaken in the current study. Furthermore, the researchers also checked for Harman's single-factor test, in line with Koay et al. (2022), and found no factor above the 50% threshold limit. Thus, future research can utilize multiple sources such as interviews, focus groups, and executing a cross-lagged design to cancel CMB in full. Fourth, in the present study, digital-leadership capability's effect on IT innovation was tested. Future studies can further explore the impact of digital-leadership capability on diverse forms of innovation with different mediators and moderators.

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