Received: 29 June 2022 | Revised: 9 December 2023 | Accepted: 24 December 2023

DOI: 10.1111/isj.12501

SPECIAL ISSUE ARTICLE

WILEY

Empowering organisational commitment through digital transformation capabilities: The role of digital leadership and a continuous learning environment

Jessica Braojos[1] | Pauline Weritz[2] | Jorge Matute[3]

[1]Department of Business Management, University of Granada, Granada, Spain

[2]Department of Industrial Engineering and Business Information Systems, University of Twente, Enschede, The Netherlands

[3]Department of Business Management, IQS School of Management, Ramon Llull University, Barcelona, Spain

Correspondence
Pauline Weritz, Department of Industrial Engineering and Business Information Systems, University of Twente, Enschede, The Netherlands.
Email: p.weritz@utwente.nl

Funding information
Consejería de Universidad, Investigación e Innovación and "ERDF A way of making Europe", Grant/Award Number: C-SEJ-148-UGR23

Abstract

Although research has shown that leveraging technologies and creating a new organisational identity are critical to staying competitive in a digital business environment, these assumptions have focused mainly on operational performance and exclude the impact on the workplace and employees. The challenge of attracting employees in the context of digital transformation is leading organisations to explore drivers of commitment. Further research is needed into the key factors that bind employees to an organisation. This study seeks to advance knowledge on this individual frontier by proposing a model in which digital leadership and a continuous learning environment mediate the impact of digital transformation capabilities on organisational commitment. Testing our model through an empirical study from Spain shows an effect of both mediators. The paper thus contributes to the IS literature by identifying two mediators and their role in achieving organisational commitment. These results also suggest a new way to approach research in digital transformation by opening a new frontier on the individual level and charting a path for future study. Moreover, the results have great practical value, generating implications for organisations and new avenues of future

research to explore the boundary conditions of the individual frontier.

KEYWORDS
continuous learning environment, digital leadership, digital transformation capabilities, organisational commitment

1 | INTRODUCTION

Digital technologies have created a paradox of choices in organisations that impact various structures, processes, and strategies (Baiyere et al., 2023; Kaganer et al., 2023). With this technological change, organisations leverage digital technologies to redefine the firm's value proposition and establish a new organisational identity (Wessel et al., 2021). As an action of change, however, digital transformation (DT) depends strongly on the employees who remain in the workplace, and a new organisational identity can impact employees' behaviour and actions (Weber et al., 2022). It could, for example, strengthen employees' resistance to change and undermine their identification with the firm. As organisations must address these responses and potential consequences of DT, research and practice must address not only the technological change but also the human side of this phenomenon.

The field of information systems (IS) has shown increasing interest in the role of organisational capabilities in facilitating DT (Bonnet et al., 2015; Vial, 2019). In the DT context, these capabilities often predict outcomes on the organisational level, such as firm performance and competitive advantage (e.g., Steininger et al., 2022). Merely building capabilities is not, however, sustainable as a resource for a new identity claim, and no blueprint exists for organisations to redefine value propositions. As employees adapt continuously in the context of DT, understanding the phenomenon's long-term impact is critical to success, yet organisations currently neglect individual engagement in the process. DT presents opportunities and threats that affect the individual frontier, including employees' behaviour and actions (Weber et al., 2022). Whereas the current debate in the IS literature has focused primarily on the impact of DT on business models and firm performance (Noesgaard et al., 2023), some scholars and practitioners have explored whether the new organisational identity influences culture and the workplace (Aroles et al., 2021; Weritz et al., 2022; Zimmer et al., 2023). Still, two challenges remain regarding DT capabilities, understood as a firm's ability to leverage digital technologies and resources to redefine the business model in a DT process. The first is to understand how these capabilities are associated with the employee's actual behaviour and actions in the organisation (e.g., leaving the firm). The second, which stems from the first, is how to advance research on the individual frontier.

First, recent research shows that employees leave organisations in the context of DT due to 'misalignment with their competences' and being in a 'state of continuous flux' (Wessel et al., 2021, p. 115). It is important to address this issue because retaining dedicated employees is imperative to preventing loss of knowledge and competences and to reducing resistance (Hess et al., 2016; Schrage et al., 2021). The value of retaining committed employees cannot be overstated. Previous studies and meta-analyses show that these individuals demonstrate higher performance and satisfaction (Bala & Bhagwatwar, 2018; Meyer et al., 2002; Meyer & Allen, 1997). Current assumptions in IS research argue that DT involves organisational cultural changes and that employees play a crucial role in shaping and adapting to these changes. If employees are not on board with DT, connecting them to the organisation can be challenging, and they can become dissatisfied (Sundermeier, 2022). Although prior research has shown the desirability of strengthening commitment for fostering change on the individual level (Weber et al., 2022), researching organisational capabilities alone does not fully explain the relationship between the new organisational identity and organisational commitment. Because changes often fail due to neglect of human elements (Seo et al., 2012), identifying potential mediators in this relationship and understanding their impact on the individual level can create new knowledge for future IS research by helping to conceptualise commitment in the context of DT.

Second, DT research often analyzes only the organisational level and does not consider new ways to explore this phenomenon at other levels of analysis. Because employees' responses are essential prerequisites of successful DT, advancing and enabling individual-level analysis in this context may be critical. The frontier between the individual and the organisation must address the actual behaviour and action (Bovey & Hede, 2001), as organisations need insight into the factors influencing employees' actual behaviour and actions to preserve the value of the human side of change in the context of DT. In current assumptions in IS, the dominant level of analysis in DT research has been the organisation (Markus & Rowe, 2023), but questions remain about how individuals perceive change. Developing new knowledge through the study of the individual frontier would expand IS research beyond the organisational level, as research at the individual level could reveal the blind spots identified but not explored in prior research. Including the employee's perspective in this context opens a crucial new individual frontier with diverse potential to advance research and practice on how to approach DT.

Although the literature claims to consider the human side in the context of DT (e.g., Abhari et al., 2021; Büchler et al., 2020), two major challenges remain: to advance research on binding employees to the new organisational identity and to chart a path for a new level of analysis to investigate the individual frontier. Our study thus aims to answer the following research question: 'How can digital transformation capabilities enhance organisational commitment?'

We hypothesise that two potential mediators (i.e., leadership and learning) link DT capabilities and organisational commitment, illustrating the important individual frontier for DT research. We ultimately propose connecting elements between the organisational level (i.e., DT capabilities) and the individual level (i.e., employees' commitment towards their organisations) by analyzing the human element and bridging the gap between DT capabilities and organisational commitment to foster a more positive response to change (Weber et al., 2022). In this vein, digital leadership could support the acceptance of DT capabilities and affirm its value for employees (Dery et al., 2017), strengthening employees' relationships with the company. Exploiting a continuous learning environment could also facilitate involvement in the change process, engaging employees in the context of DT (Schlagwein & Bjorn-Andersen, 2014; Warner & Wäger, 2019).

This study's theoretical contribution is twofold. First, we identify the mediators that connect DT capabilities to organisational commitment and explain their role in impacting the individual frontier. To do so, we theorise the position of organisational commitment in the context of DT and integrate a theory from organisational behaviour (OB) (the three-component model of organisational commitment) into the IS literature. Our findings illustrate the importance of digital leadership and a continuous learning environment in ensuring organisational commitment in the context of DT. We thus bridge the gap between technology and employees and focus on the consequences of DT capabilities at the individual level. Second, we explore the individual frontier of DT, developing theoretical insights to formulate a new approach to DT research. Considering actual behaviour and response to change enables us to chart a path for future research on this individual frontier. Finally, we provide practical implications to help organisations and business executives bind employees to the organisation and explore their actual behaviour and actions in the context of DT.

2 | THEORETICAL BACKGROUND

2.1 | Digital transformation as the study context

The DT perspective has become a foundational framework in IS literature, as it seeks to explain the strategic role of digital technologies in shifting an organisation's identity (Baiyere et al., 2020; Bonnet & Westerman, 2020; Hinings et al., 2018). Thus, not only DT's objectives and transformational character but also the constraints of the DT framework are important. DT is conceptualised as a process of leveraging digital technologies to redefine business value, leading to a change in work practices and the emergence of a new organisational identity (Soluk &

Kammerlander, 2021; Wessel et al., 2021). As a type of information technology (IT), digital technologies are seen predominantly as enablers of new ways of creating value and changing business models (Hess et al., 2016; Vial, 2019). Significantly, DT's transformation activities strengthen the organisation's value proposition and redefine its identity (Wessel et al., 2021). The outcome of the transformation activities and the organisation's redefined value proposition thus produce a new organisational identity (Wessel et al., 2021). The longitudinal dynamics of such transformation involve structural changes in work practices, reconciliation actions, and overcoming barriers (Vial, 2019; Wessel et al., 2021).

The parameters of DT establish the study context, a representative description and justification of the proposed model, and the model's underlying boundary conditions (Rivard, 2014). The contextual assumptions determine the DT perspective, increasing the power of explaining relationships among the concepts (Rivard, 2014). The DT perspective functions to establish the study's conditions, and its contextual assumptions highlight the boundaries that constrain research and limit the DT perspective to explain the phenomenon (Benbya et al., 2020; Whetten, 1989). As empirical evidence in the field is limited to the impact of DT on organisational factors such as business performance, the association and distinction among different roles and resources (e.g., capabilities, culture, leadership) in the context of DT have not been explored conceptually. For example, previous research has not reflected the idea that DT has the potential to impact the workplace. The individual frontier is thus underdeveloped in the DT perspective, and further work is needed to advance the IS literature. In conclusion, the DT perspective provides a unique concept through which to establish the boundary conditions of this study (i.e., DT's transformation activities and outcomes) and build the contextual assumptions to theorise which drivers lead to organisational commitment.

2.2 | Three-component model of commitment

Organisational commitment and DT may condition each other on different levels, and this impact may be relevant to realising the value of DT. Exploring the individual frontier is critical to developing new knowledge on how DT initiatives resonate with employees' perceptions and obtaining employee commitment to the new organisational identity. On the one hand, DT provides increased opportunities for the entire workforce (e.g., better collaboration and communication among employees, faster data access), influencing employee attitudes and behaviour (e.g., satisfaction, socialisation, motivation) and thus organisational commitment (Bala & Bhagwatwar, 2018). On the other, although various disciplines have studied organisational commitment (e.g., Choi et al., 2015; Meyer & Allen, 1997; Meyer & Herscovitch, 2001), limited literature has demonstrated the increasing importance of this concept in the context of DT, and no clear consensus has emerged on causality in the relationship (Schrage et al., 2021; Soh et al., 2019).

The three-component model of commitment gives this study a theoretical framework with additional contextual assumptions. Organisational commitment as a psychological state is the employee's bond with an employer, often affecting behaviour and actions (Meyer & Allen, 1997). The employee's emotional attachment and extent of identification with the firm influence how strongly employees seek to achieve the organisation's goals and culture (Cho et al., 2009; Choi et al., 2015). As the employee's connection to the organisation, organisational commitment is the desire and intention to stay in the firm (Cho et al., 2009; Meyer et al., 1993). Conceptualised by Meyer and Allen (1997) as composed of affective, normative, and continuance commitment, the three-component OB model research proposes a holistic understanding of employees' attitudes and behaviours (Meyer & Herscovitch, 2001). Affective commitment, defined as an emotional identification with the organisation, is high if the employees' experiences are consistent with their expectations or, for example, if they feel workplace satisfaction. Normative commitment refers to socialisation experiences in the firm or potential benefits that might occur on the job. Such commitment increases obligation and attachment to the organisation, whether employees fear losing their jobs or hope of obtaining job-related advantages (e.g., social activities or financial stability). Continuance commitment describes employee involvement in the company that would be lost if they did not stay. This commitment results from the importance of

employees' personal economic situation or lack of options. Our study builds on the three-component model of commitment to conceptualise employees' commitment to the company.

2.3 | Organisational commitment in the context of digital transformation

The individual frontier is underdeveloped in DT research but could be critical, as potential negative or unintended consequences may arise with this change. Employees could leave the organisation because of decreased motivation or satisfaction due to a new organisational identity (Verhoef et al., 2021). Fear of job loss resulting from DT could also create a sense of stress and insecurity or reduce involvement (Sundermeier, 2022). Further, DT could lead employees to perceive efficiency, not human factors, as the main priority, potentially reducing social experiences (Vial, 2019). The question remains, however, of the potential driver for organisational commitment in the context of DT, and one could argue the opposite association of reverse causation, resulting in different drivers of organisational commitment in the context of DT. Incorporating the DT context could show employees that the organisation is committed to staying modern and competitive in the market. Using digital technologies could also provide employees with tools and knowledge that enable higher productivity or effectiveness (Kane et al., 2019). Further, DT initiatives could help employees make more informed decisions, contributing to their sense of ownership. Finally, DT could affect collaboration and communication among employees, leading them to experience higher socialisation and interact in different workplace arrangements (Asatiani et al., 2021; Meyer et al., 1993; Mueller & Renken, 2017; Weritz et al., 2022). Given that DT's potential negative and unintended consequences for the individual frontier remain a significant problem that must be addressed, this study seeks to identify the important link between DT and commitment.

2.4 | Digital transformation capabilities

Based on the parameters of our study context and the assumptions framing the DT perspective, DT capabilities are resources on which organisations can draw to redefine their identity. In this case, we conceptualise DT capabilities as the abilities that firms leveraging digital technologies need to redefine their value proposition and create a new organisational identity. Their role goes beyond technology implementation, enabling organisations to align their efforts to become more digitally oriented (Carroll et al., 2023). In this vein, Bonnet et al. (2015) propose four critical dimensions to transform an organisation into a digital organisation—the abilities of a digital-first mindset, digitised practices and operations, empowered talent, and data access and collaboration tools (Bonnet et al., 2015). A digital-first mindset involves embracing digital opportunities and prioritising digital solutions over traditional ones. Digitised practices and operations include effective use of automation and data-driven decision-making. Empowered talent is the ability to develop digital skills across the organisation and involves employees in the digital context. Finally, data access and collaboration tools use real-time customer and operations data effectively and implement collaboration tools. Collectively, these dimensions represent a comprehensive approach to leveraging digital technologies to redefine organisational identity (Bonnet et al., 2015; Wessel et al., 2021). We thus define DT capabilities as the firm's proficiency in leveraging digital technologies and resources to redefine the business model in a DT process (i.e., in terms of a digital-first mindset, digitised practices and operations, empowered talent, and collaboration tools). However, this change produces a mismatch between DT capabilities and organisational commitment that organisations must address to realise the value of DT. We build on earlier research in the change management literature to bridge the gap between DT capabilities and organisational commitment, arguing that human elements must be considered to guarantee desirable outcomes on the individual level (Weber et al., 2022).

2.5 | Relationship between DT capabilities and organisational commitment

Individual responses to change are the primary initiators that should be considered when implementing a change (Weber et al., 2022). In the organisational context, employees are the driving element, as their actual behaviour is required to sustain these new actions. Companies must thus take care to ensure the achievement of desirable outcomes. One individual outcome may be employee commitment (Weber et al., 2022), and the organisational environment plays a central role in this achievement (Weber et al., 2022). Unless human elements accompany the transition to a new organisational identity (Weber et al., 2022), firms may lose employees (Wessel et al., 2021). Some literature that aims to contribute to the conversation on success in DT processes suggests that organisations should consider factors such as capabilities, leadership, and culture (Vial, 2019). Although the link between DT capabilities and organisational commitment must be addressed to realise the value of DT on different levels, DT capabilities may not be enough to address employees' perceptions and behaviours. Facilitating factors are needed to support employees as they make sense of the new organisational identity and enable the desired outcomes. The DT perspective argues that two distinct mediators may connect DT capabilities to organisational commitment in the context of DT. Based on definitions of the constructs, these mediators are digital leadership and a continuous learning environment. These resources, which can be displayed through leadership behaviour and a learning environment that enables experimentation and trust, may encourage employees to participate in the DT process and seek new knowledge that impacts the intended outcomes of a new organisational identity at the individual level.

As an emerging variable in IS research (Eberl & Drews, 2021; Kane et al., 2021), leadership can help organisations incorporate a role that addresses potential challenges. Digital leadership is conceptualised as a style of competences, behaviours, and practices that inspire and motivate employees in the context of DT (e.g., Singh & Hess, 2017; Tumbas et al., 2017; Vial, 2019). It is a broad term not necessarily limited to the executive level that can apply to individuals who manage employees and drive the new organisational identity. Previous literature in the field identified various relevant leadership styles related mainly to transformational leadership (Eom et al., 2020), arguing that digital leaders show a clear vision and roadmap towards DT and support DT processes (Hansen et al., 2011; Vial, 2019; Weritz et al., 2020). Digital leaders are communicators who engage effectively with others, encouraging innovation and critical thinking around DT. They also use digital tools, technologies, and platforms while possessing a high level of digital literacy (i.e., understanding how to use digital tools and technologies effectively and efficiently) (Kane et al., 2021). Such a management style can empower employees to take ownership of their work and make decisions about how to approach tasks with different digital tools. Moreover, digital leaders can foster a sense of community and connectedness among employees and encourage exchange of knowledge and data (Kane et al., 2021).

Organisational learning is another important resource in the DT context (Nadkarni & Prügl, 2021). Continuous learning is a knowledge acquisition process in which the organisation cultivates learning (Tannenbaum, 1997). In a continuous learning environment, the firm supports the learning processes through which employees help each other to learn and are rewarded for learning (Kane et al., 2017). It involves experimenting and innovating with others to discover new possibilities, leveraging existing knowledge to improve current processes, and extracting value from existing knowledge. Part of this continuous learning environment involves applying knowledge in a practical learning experience and includes a subsequent development and application phase in the working environment (March, 1991). A continuous learning environment is especially important in the context of DT, as technological advancements constantly create new opportunities and threats for employees (Shao et al., 2022). Overall, continuous learning evolves in an organisational environment that supports employees through knowledge acquisition, application, and sharing (March, 1991; Shao et al., 2022). A continuous learning environment allows employees to control their learning and development, providing automated feedback and increasing autonomy (Deci et al., 1999; James et al., 2019). It also encourages employees to seek out new information and experiment with different approaches. Individuals can build both breadth and depth of knowledge and develop the ability to apply their knowledge to daily tasks (Shao et al., 2022).

3 | HYPOTHESIS DEVELOPMENT

3.1 | The mediating role of digital leadership

DT capabilities may help organisations develop digital leadership across the workforce. First, a digital-first mindset could provide new ways to use data and inform their decision-making and strategy. This mindset can help leaders develop a more data-driven, evidence-based approach to leadership and shape how they behave with their employees (De Medeiros & Macada, 2022). Second, data access and collaboration tools could enable digital leaders to share updates and information more widely and quickly with employees (Weber et al., 2022). It could also increase the practical communication tools needed for a digital leadership style. Third, empowered talent could enable digital leadership by providing a skilled workforce to advance DT, as empowered employees are more likely to take ownership of their work and seek opportunities for innovation and improvement. Fourth, digitised practices and operations could help leaders develop a more agile, innovative leadership style (Eberl & Drews, 2021). By embracing new technologies and approaches, leaders can encourage a culture of experimentation and continuous improvement within their organisation. The flexibility developed by successful DT capabilities enables leaders to fully exploit new digital opportunities and ways to manage risk (i.e., digitised practices and operations) (Kane et al., 2019). Finally, DT capabilities could help leaders to develop a more responsive, transparent, open, and inclusive leadership style. For these reasons, we propose the following hypothesis:

> **Hypothesis 1a.** There is a positive relationship between digital transformation capabilities and digital leadership.

Digital leadership may also play a crucial role in fostering organisational commitment. Digital leaders are responsible for communicating the organisation's vision, and such leadership may make employees feel supported and encouraged (Eberl & Drews, 2021). Leaders can utilise DT capabilities to reach employees and connect them to the organisation (Asatiani et al., 2021; Kane et al., 2021). First, by using digital tools for communication, digital leaders can strengthen employees' affective commitment by creating trust and engagement. Digital leaders could also empower employees in their jobs and give them opportunities to use technology to work more effectively, enhancing their affective commitment to the organisation (Singh & Hess, 2017). Involving employees in planning and decision-making processes around DT could also increase affective commitment. Further, clarification by the digital leader of any changes in expectations and roles to be achieved could decrease employees' feeling that they might be replaced by technologies (Schrage et al., 2021). Second, a digital leader may influence normative commitment by acknowledging the value of DT because purpose-driven organisations increase employees' intention to stay (Lee et al., 2021). By noting the urgency and purpose behind the transformation, a digital leader's digital vision could increase ethical obligations to stay (Schrage et al., 2021). Communicating the advantages of DT in employees' daily activities (i.e., data access, collaboration tools with customers, and digitised practices) could increase normative commitment, as employees will better understand the benefits of DT (Bonnet & Westerman, 2020). Third, digital leadership could enhance continuance commitment by recognising and rewarding achievements in the context of DT (e.g., successful projects or initiatives). Collaboration tools such as instant messaging or video conferencing software enable digital leaders to communicate with their teams regardless of location or time zone. By helping to ensure everyone is on the same page and working towards common goals, leaders provide a positive sense of shared commitment that employees would lose if they left the firm. Based on the foregoing, we conclude that a digital leader could enhance organisational commitment. We thus propose:

> **Hypothesis 1b.** There is a positive relationship between digital leadership and organisational commitment.

3.2 | The mediating role of a continuous learning environment

DT capabilities (i.e., digital-first mindset, digital practices and operations, empowered talent, and data access and collaboration tools) could enhance a continuous learning environment for employees (Shao et al., 2022). First, a digital-first mindset could encourage employees to experiment with new technologies, potentially enhancing explorative learning by providing new tools and platforms for experimentation and innovation (Gurbaxani & Dunkle, 2019). As a digital-first mindset can make fixed mindsets more flexible, it could open new perspectives or paths for employees to develop themselves (Kane et al., 2019). Second, digital practices and operations could enable employees to collect, store, and analyze data that can be leveraged for learning (Shao et al., 2022). For instance, data analytics may help organisations identify areas for optimization and new opportunities for innovation and growth (Chen et al., 2012; Kane et al., 2019). Data can also help to track progress, identify areas for improvement, and optimise individual learning experiences. Third, empowered talent promotes a continuous learning environment by enabling employees to learn on the job and in real-time (e.g., digital platforms and tools for instant feedback on skills). It could also allow employees to learn from their mistakes, improve performance (Mueller & Renken, 2017; Tabrizi et al., 2019), and even increase opportunities for learning on the job and being active in communities (Kane et al., 2019). Fourth, data access and collaboration tools facilitate collaboration among employees, enabling them to share knowledge and ideas more easily. At the same time, DT could automate routine processes, freeing employees to focus on other things (e.g., learning). Finally, data access and collaboration tools can enable employees both to learn by opening self-paced opportunities (Fang et al., 2022; Kane et al., 2019) and to share knowledge and expertise with one another simultaneously. We therefore hypothesise the following:

> **Hypothesis 2a.** There is a positive relationship between digital transformation capabilities and a continuous learning environment.

A continuous learning environment could also increase organisational commitment, as employees feel supported and encouraged to learn (Nadkarni & Prügl, 2021). First, a continuous learning environment could increase affective commitment, making individuals more likely to feel emotionally attached to the organisation. A continuous learning environment could also enable employees to see the organisation's values in terms of continuous improvement and feedback (Hobert et al., 2022). For instance, the online platform *Skillsoft* showed that learning initiatives could act as a 'glue that holds the social elements of the company together' (Kane et al., 2021, p. 10). Second, a continuous learning environment could lead to normative commitment by creating a culture that fosters a sense of obligation and loyalty to the organisation, potentially aligning employees' goals and the organisation's DT efforts. Third, firms that enable employees to build their competences, capabilities, and opportunities for innovation could enhance employees' identification with the firm (Chan et al., 2019; Mueller & Renken, 2017). Despite this, a continuous learning environment could lead to higher continuance commitment by increasing the value employees attribute to their jobs and reducing the perceived costs of leaving the organisation. As individuals are lifelong learners, firms must develop employees to satisfy their needs and increase their digital literacy (Kane et al., 2019). The right balance between intrinsic motivation and the provision of resources and learning opportunities produces the successful knowledge creation needed to bind employees (Kane et al., 2019; Ostmeier & Strobel, 2022). In sum, as a continuous learning environment could increase organisational commitment, we propose the following:

> **Hypothesis 2b.** There is a positive relationship between a continuous learning environment and organisational commitment.

Figure 1 presents the conceptual model proposed.

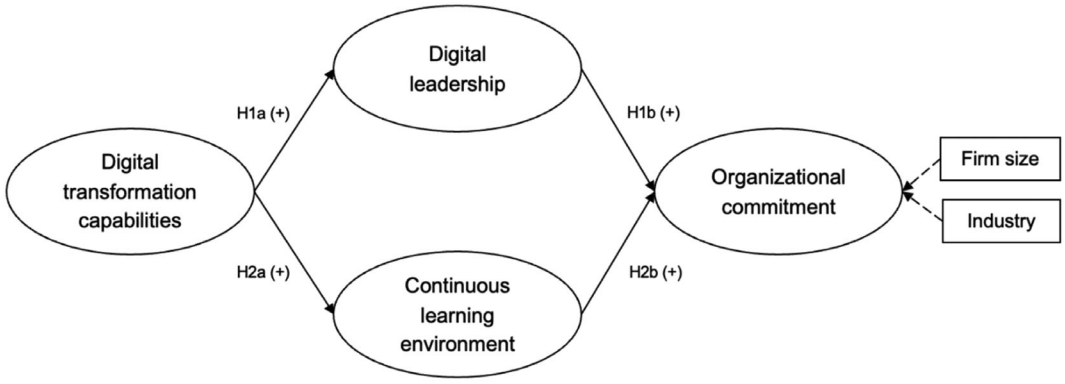

FIGURE 1 Conceptual model.

4 | RESEARCH METHODOLOGY

4.1 | Study design and data collection

This study adopted an empirical quantitative approach to test the hypotheses, using survey data to measure the conceptual model proposed. The study design followed the guidelines and recommendations for cross-sectional data by Maier et al. (2023) to ensure detailed, transparent research reporting for the sampling strategy, data collection, and research instruments.

First, we analyzed the digital competitiveness ranking for the sampling strategy to select a country with sufficient digital performance in future readiness, knowledge, and technology (International Institute for Management Development, 2022; Ministry of Economic Affairs and Digital Transformation, 2021). Spain is ranked 28th worldwide, and its resources are comparable to those of countries with similar levels of adoption and exploration of new digital technologies. For example, Spanish data can be generalised to several economies in Europe (e.g., Belgium, Ireland, Lithuania, Luxembourg), Asia (e.g., Qatar, Japan, Malaysia, Bahrain), and Oceania (e.g., New Zealand). Next, we selected a group of the largest industries in Spain in which DT is highly relevant (European Commission, 2020). The data collection was based on a list of medium-to-large-sized firms in Spain (i.e., over 50 employees and a minimum of 10 million EUR revenue per year) in the SABI database (Iberian Balance Sheet Analysis System). These criteria led to the initial selection of 3844 institutions from the long list of Spanish firms retrieved. Searching for and validating the contact information in the database produced a shortlist of companies ($n = 2578$). In the next step, a market research consultancy contacted the companies by phone. From the shortlist of companies aligned with the sampling strategy, we ultimately received 154 valid questionnaires during a collection period (October 2020 to April 2021). The response rate of 5.97% for the final shortlist of companies is satisfactory due to the difficulty of contacting IT managers (Benitez et al., 2018) and the circumstances of COVID-19. Before testing the effects of the proposed research model, we performed a statistical power analysis to determine the required minimum sample size (Kock & Hadaya, 2018). The inverse square root method to establish the minimum required sample size showed no bias in the estimators in our model (Kock & Hadaya, 2018). The sample size is 154 and has sufficient statistical power to test the statistical significance of the proposed research model for path coefficients of a minimum of 0.200, with an alpha level of 0.05.

We made substantial efforts during the data collection to ensure reliability and validity by preventing common method variance (Maier et al., 2023). First, we guaranteed the respondents' anonymity, did not present variables and items in order, did not use labels, and did not permit respondents to move back and forth in the survey (Podsakoff et al., 2003). Second, the company in charge of administering the survey had a well-designed protocol. The telephone

survey was completed by the CDO[1] or another knowledgeable person. When the respondent was not comfortable or qualified to answer the questions, he or she was asked to identify the appropriate executive to answer them.

4.2 | Sample characteristics

The sample was composed of the following industries: 65 manufacturing firms (42.21%), 35 technology and communication firms (22.73%), 13 retail firms (8.44%), and 41 firms (26.62%) from other industries (e.g., finance and insurance or energy and electricity). Most firms (57.14%) had 50–249 employees, 31.17% had 250–1000, 10.39% had 1001–10 000 employees, and 1.3% had more than 10 000 employees. The revenues were divided among 10–20 million EUR (33.12%), 20–50 million EUR (30.52%), and over 50 million EUR per year (36.36%). The CDOs who answered the questions were mainly people ages 41–50, of whom 36% identified as female. By including a single key informant per firm, we aimed to capture a range of viewpoints and gain a comprehensive understanding of the model (Benitez et al., 2020). This approach also helps to increase the generalizability of our findings to different contexts and industries.

4.3 | Data and operationalization of variables

4.3.1 | Construct development: Digital transformation capabilities

Measuring DT capabilities requires a newly developed scale that measures the firm's proficiency in leveraging digital processes and technologies to shift the organisational identity and business model (i.e., strategy, people, and culture). We followed the steps suggested by Netemeyer et al. (2003) and MacKenzie et al. (2011) to develop a reliable and valid scale to measure the construct of DT capabilities. First, we developed a thorough understanding of the literature review on DT and a conceptual definition of the construct. Second, we generated a pool of items based on existing literature, tested the items in a q-sorting test, and formally specified our measurement model. Third, we pretested these items with 9 IT and business executives to help ensure content validity and the scale's coverage of all relevant aspects. We thus measured DT capabilities as a second-order composite construct with 4 first-order dimensions[2]: digital-first mindset (4 items), digitised practices and operations (4 items), empowered talent (3 items), and data access and collaboration tools (4 items). Fourth, we checked the structure of the measures using confirmatory composite analysis to assess whether we had assigned the indicators correctly. Finally, we tested the weights, loadings, and multicollinearity to validate the measurement model, as is typical with composite measures.

4.3.2 | Construct operationalization

We assessed digital leadership as a composite first-order construct composed of 5 items from Buil et al. (2019) adapted to the context of DT. To adapt the items, we reviewed the literature on digital leadership and identified key characteristics especially relevant to the DT context (e.g., Kane et al., 2019). We then modified the original items to capture these characteristics in a digital context.

We measured the continuous learning environment as a composite first-order construct composed of 3 items by adapting the scale from Song et al. (2009). The measure was based on the Dimensions of Learning Organisations Questionnaire (DLOQ) developed by Watkins and Marsick (1993).

[1]This role assumes sufficient knowledge of the context of DT (ranging from the strategic and human to the technological side) to answer questions regarding the situation in their respective firm (Kunisch et al., 2022; Li et al., 2021; McCarthy et al., 2021; Tumbas et al., 2017).
[2]The measurement was driven by theory, and the items were generated based on Bonnet et al. (2015).

Organisational commitment is a composite first-order construct composed of 5 items from Cegarra-Navarro et al. (2020) and Cho et al. (2009). Based on the three-component conceptualizations of Meyer et al. (1993), the scale measures managerial perception of organisational commitment. While employees' self-reported measures of organisational commitment can be helpful, measuring organisational commitment from the managers' perspective also provides reliable results (e.g., Shore et al., 1995; Shore et al., 2008). Since managers are responsible for evaluating employees' performance and behaviour, they can record their perceptions of employee commitment. Managers also have a broader perspective on the organisation and its goals, which can provide a more holistic understanding of how employee commitment contributes to organisational success (Shore et al., 1995). For more details on indicators, see Table A1 in the Appendix.

We controlled for firm size and industry because these factors could affect organisational commitment. We measured firm size as the number of employees per organisation, computing the industry as a first-order composite construct composed of 3 indicators (i.e., dummies referring to 4 categories of industries)[3] (Benitez et al., 2020).

5 | EMPIRICAL ANALYSIS AND RESULTS

5.1 | Mode of estimation

We used partial least squares (PLS) path modelling to empirically test the proposed research model. As a structural equation modelling (SEM) estimation method, it has often been used in management and IS research (e.g., Büchler et al., 2020). PLS is appropriate for estimating our proposed empirical model for the following reasons: (1) we have a complex model with a great number of constructs, indicators, and relationships (Sarstedt et al., 2021); (2) we are modelling the constructs of our model as composites (Rigdon et al., 2017); and (3) we must obtain latent variable scores through a second-step approach in order to estimate high-order constructs (i.e., DT capabilities). We used ADANCO 2.1 professional software (http://www.composite-modeling.com/) to estimate the measurement and structural models (Henseler & Dijkstra, 2015). The significance levels (i.e., weights, loadings, and path coefficients) were obtained through bootstrapping with 10 000 subsamples. The correlation matrix can be found in Table A2 of the Appendix.

5.2 | Measurement model evaluation

Variance-based SEM results were assessed in a two-step approach. First, we validated the measurement model by testing the quality of the construct measurement. Second, we validated the structural model by assessing the relationship between constructs (Henseler, 2017).

To evaluate the measurement model, we assessed the structure of the composite measures through confirmatory composite analysis (Henseler et al., 2014). This analysis compared the empirical and the model-implied correlation matrices to analyze whether the data supported the structure of the composite measures (Benitez et al., 2020). The discrepancy between the empirical and the model-implied correlation matrixes at first- and second-order levels was determined by calculating SRMR, unweighted least squares (d_{ULS}), and geodesic (d_G) discrepancies. The values of the discrepancies at the first- and second-order level were below the 99% quantile of the bootstrap discrepancies, suggesting 1% probability support for the measurement structure. The model should, therefore, not be rejected based on an alpha level of 0.01, and we affirm that the structure of the measures in our model is correct. Table 1 displays the results of the confirmatory composite analysis.

[3]We classified the industries into four groups and established a reference group (retail) to create three dummies.

TABLE 1 Results of the confirmatory composite analysis.

	First-order constructs			Second-order constructs		
Discrepancy	**Value**	**HI_{99}**	**Conclusion**	**Value**	**HI_{99}**	**Conclusion**
SRMR	0.042	0.045	Supported	0.053	0.080	Supported
d_{ULS}	0.728	0.817	Supported	0.653	1.468	Supported
d_G	0.593	0.836	Supported	0.332	0.400	Supported

We also evaluated content validity, multicollinearity, and the significance of weights and loadings for items and dimensions (Benitez et al., 2020). Previously validated scales ensured content validity. We developed the DT capabilities scale based on assumptions drawn from previous literature, following the guidelines from Netemeyer et al. (2003) and MacKenzie et al. (2011). Multicollinearity was evaluated at first- and second-order levels. The variance inflation factor (VIF) values for composites estimated in mode B were below the threshold of 5 (Benitez et al., 2020; Tanriverdi & Uysal, 2015), indicating that multicollinearity is not a problem in our data. We further evaluated the significance level of weights and loadings at first- and second-order levels. Although all weights of indicators and dimensions were significant except 1 item per dimension measuring DT capabilities, we decided to keep all items for two reasons: (1) eliminating indicators in composites can alter the meaning of the construct (Henseler, 2017), and (2) every loading of an indicator or dimension was significant at a level of at least 0.001.

On obtaining suitable results for the confirmatory composite analysis and measurement properties, we proceeded to test the hypotheses of the proposed model. Table A1 (see Appendix) presents our evaluation of the measurement model.

5.3 | Structural model evaluation

5.3.1 | Overall fit of the estimated model

We evaluated model fit using a method similar to a confirmatory composite analysis by examining the accuracy of the fit indices (Henseler, 2017). As the SRMR value for the mediation model was well below the threshold of 0.080 (0.053), and the discrepancy values of d_{ULS} and d_G were below the 99%-quantile of the bootstrap, our mediation model should not be rejected based on an alpha level of 0.01.

5.3.2 | Test of hypotheses

To test the model empirically, we estimated path coefficients, direct and indirect effects, their significance level, and R^2 values. The direct effect of DT capabilities on organisational commitment was not significant ($\beta = -0.007$, $p_{\text{one-tailed}} > 0.1$). Evaluation of the indirect effect to test whether DT capabilities affect organisational commitment through digital leadership and continuous learning environment showed that this effect was significant ($\beta = 0.581$, $p_{\text{one-tailed}} < 0.001$), suggesting indirect-only mediation between DT capabilities and organisational commitment. These results suggest that DT capabilities are positively related to digital leadership (Hypothesis 1a) ($\beta = 0.810$, $p_{\text{one-tailed}} < 0.001$) and continuous learning environment (Hypothesis 2a) ($\beta = 0.701$, $p_{\text{one-tailed}} < 0.001$). Moreover, digital leadership (Hypothesis 1b) ($\beta = 0.337$, $p_{\text{one-tailed}} < 0.01$) and continuous learning environment (Hypothesis 2b) ($\beta = 0.440$, $p_{\text{one-tailed}} < 0.001$) were positively related to organisational commitment. Figure 2 and Table 2 display the results of hypothesis testing.

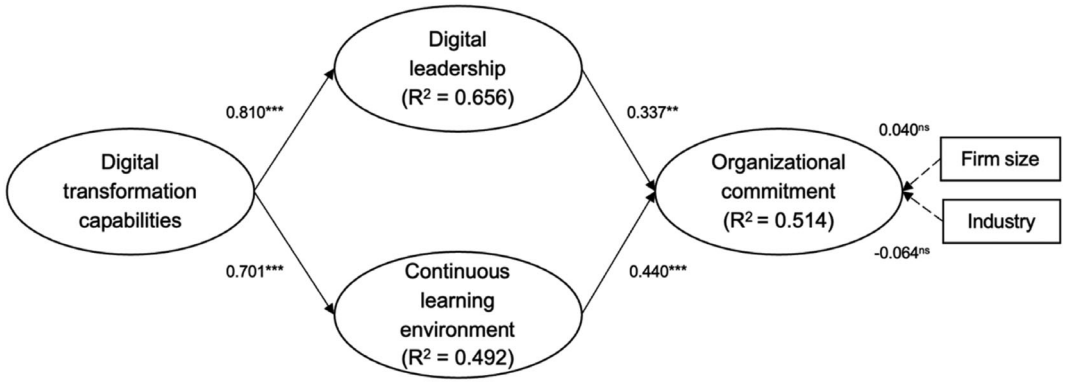

FIGURE 2 Test of hypotheses ($^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$).

As multiple mediators were involved in the indirect effect (i.e., digital leadership and continuous learning environment), we performed multiple mediation analysis to test the effect of each mediator. The results indicate an indirect effect through digital leadership ($\beta = 0.273$, CI [0.096, 0.435]) and continuous learning environment ($\beta = 0.308$, CI [0.176, 0.442]). Both these mediators support mediation equally, as they have similar variance accounted for (VAF) values (0.475 and 0.537, respectively), and there are no significant differences between the effects.

The results thus indicate that digital leadership (Hypotheses 1a and 1b) and continuous learning environment (Hypotheses 2a and 2b) mediate the relationship between DT capabilities and organisational commitment. Table 3 provides details of the mediation analysis.

Finally, although the effects of firm size and industry on the final endogenous variable are not significant for the control variables, including these control variables in the model lends additional credibility to the empirical analysis because the hypotheses are sustained after controlling for them. The R^2 values are 0.656, 0.492, and 0.514 for digital leadership, continuous learning environment, and organisational commitment, respectively, indicating good explanatory power of the endogenous variables.

5.3.3 | Post-hoc analysis

To test the robustness of our empirical model, we performed a post-hoc analysis, considering digital leadership and continuous learning environment as moderators instead of mediators. We found no moderations in our sample; the impacts of digital leadership ($\beta = -0.142$, $p_{\text{one-tailed}} = 0.128$) and continuous learning environment ($\beta = 0.124$, $p_{\text{one-tailed}} = 0.146$) were not significant in the relationship between DT and organisational commitment (see Table A3 of the Appendix). Nevertheless, the rest of the findings support the results of our proposed model, as digital leadership and continuous learning environment positively and significantly influenced organisational commitment.

5.3.4 | Endogeneity test

As we consider our proposed model to be explanatory, controlling for endogeneity is crucial to the proper testing of causal explanations (Shmueli, 2010). Endogeneity problems can arise for several reasons—such as measurement errors, reverse causality, or common method variance. We, therefore, applied the Gaussian copula approach to examine the presence of endogeneity. This approach corrects for endogeneity by modelling the correlation between variables with potential endogeneity problems and the error term by adding a copula term (Hult et al., 2018). First,

TABLE 2 Structural model evaluation.

Beta coefficient		Mediation model
Digital transformation capabilities → Digital leadership (Hypothesis 1a)		0.810*** (22.645) [0.746, 0.865]
Digital leadership → Organisational commitment (Hypothesis 1b)		0.337** (2.777) [0.124, 0.535]
Digital transformation capabilities → Continuous learning environment (Hypothesis 2a)		0.701*** (14.167) [0.612, 0.777]
Continuous learning environment → Organisational commitment (Hypothesis 2b)		0.440*** (3.925) [0.248, 0.620]
Digital transformation capabilities → Organisational commitment		−0.007^{ns} (0.060) [−0.256, 0.217]
Control variables		
Firm size → Organisational commitment (control variable)		0.040^{ns} (0.786) [−0.067, 0.133]
Industry → Organisational commitment (control variable)		−0.064^{ns} (0.810) [−0.163, 0.151]
	R^2	**Adjusted R^2**
Digital leadership	0.656	0.653
Continuous learning environment	0.492	0.489
Organisational commitment	0.514	0.497
Overall model fit of the estimated model	**Value**	**HI_{99}**
SRMR	0.070	0.082
d_{ULS}	1.128	1.568
d_G	0.379	0.406
Mediation analysis	**Indirect effect**	**Total effect**
Digital transformation capabilities → Organisational commitment	0.581*** (6.113) [0.417, 0.740]	0.574*** (8583) [0.454, 0.681]

Note: $^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$, two-tailed test for control variables and the indirect effect, and one-tailed test for the other relationships.

we checked that the variables in our model were non-normally distributed, enabling us to apply the Gaussian copula approach. Skewness ranged from −0.872 to 0.971, and kurtosis from 1.903 to 0.481. Second, we created a regression model that included copula terms in the relationships with the potential for problems of endogeneity. Since we considered Hypotheses 1a and 2a, and the relationship between digital transformation capabilities and organisational commitment as having the potential for these problems, we added 3 copulas to these relationships. Adding more than 2 or 3 copula terms in a model should be avoided unless it has very large datasets (Becker et al., 2022). Third, we assessed the significance of the copula coefficients to address potential endogeneity problems. As the copula

TABLE 3 Multiple mediation effects.

Direct effects	Coefficient	Bootstrap 90% CI			
		Percentile		Biased corrected (BC)	
a1: Digital transformation capabilities → Digital leadership	0.810	0.745	0.865	0.746	0.865
a2: Digital transformation capabilities → Continuous learning environment	0.701	0.610	0.775	0.612	0.777
b1: Digital leadership → Organisational commitment	0.337	0.118	0.530	0.124	0.535
b2: Continuous learning environment → Organisational commitment	0.440	0.247	0.619	0.248	0.620

Indirect effects	Coefficient	Bootstrap 90% CI				VAF
		Percentile		BC		
a1 × b1 (H1)	0.273	0.092	0.430	0.096	0.435	0.475
a2 × b2 (H2)	0.308	0.174	0.440	0.176	0.442	0.537
Total indirect effect	0.581	0.411	0.734	0.417	0.740	1.013

Differential effect	Indirect effects comparison				
	Coefficient	Bootstrap 95% CI			
		Percentile		BC	
M1 → M2 = a1 × b1 → a2 × b2	−0.035	−0.358	0.263	−0.353	0.268

Note: a1 × b1: Digital transformation capabilities → Digital leadership → Organisational commitment; a2 × b2: Digital transformation capabilities → Continuous learning environment → Organisational commitment.

coefficients were not significant (see Table A4 in the Appendix), we confirm that the model does not suffer from endogeneity in the context of our empirical example, permitting us to use the original PLS model (Hult et al., 2018).

5.4 | Summary of findings

This study tested the proposed novel research model with survey data. The data show that firms can only achieve organisational commitment through DT capabilities in the presence of digital leadership and a continuous learning environment (Table 2). Hence, one key study finding is that DT capabilities enhance digital leadership (Hypothesis 1a) and that digital leadership increases organisational commitment (Hypothesis 1b). The results also highlight that DT capabilities increase a continuous learning environment (Hypothesis 2a). The last key finding indicates that a continuous learning environment increases organisational commitment (Hypothesis 2b). Overall, the findings show that DT capabilities do not affect organisational commitment without the support of digital leadership and continuous learning, as they affect the intention to stay in the company (Table 3).

6 | DISCUSSION

6.1 | Theoretical implications for IS research

This study makes two key contributions that further DT research in IS. First, we identify two mediators in the relationship between DT capabilities and organisational commitment and advance understanding of their role in the

formation of organisational commitment. Second, we open a new way to approach DT research from the individual frontier and chart a path for future research.

The findings show that DT capabilities are only indirectly related to organisational capabilities and that specific elements are critical to bridging this gap. The complex association between DT capabilities and organisational commitment has been clarified via two mediators, implying that DT capabilities will only contribute to binding employees in the presence of digital leadership and a continuous learning environment. The study findings thus advance earlier research on DT through several new insights. Although IS research has studied capabilities (e.g., Steininger et al., 2022), it is surprising that they are insufficient to realise the value of DT. Our theorising nuances the findings of earlier observations in the field by highlighting that employees quit the organisation in the context of DT (Wessel et al., 2021) and that human elements are important in inducing desirable outcomes of change at the individual level (Weber et al., 2022). Our study findings advance research on the importance of leadership (e.g., Bonnet & Westerman, 2020; El Sawy et al., 2016) and culture (e.g., Hansen et al., 2011) in influencing employee attitudes and behaviour. Yet our study highlights the impact of DT capabilities on digital leadership rather than assuming that leadership enhances organisational capabilities (e.g., Benitez et al., 2022). The mediating role of leadership in the relationship between DT capabilities and organisational commitment could be explained by increasing emotional identification and satisfaction with the organisation. As suggested in previous work by Jackson et al. (2013), this mediating role can be explained by the positive impact of transformational and charismatic leadership on affective and normative commitment.

The findings further demonstrate the mediating role of continuous learning opportunities for individuals in enhancing organisational commitment. Unlike earlier research (Kensbock & Stöckmann, 2021; Verhoef et al., 2021), our study supports leveraging the potential of DT to facilitate learning. Although prior research suggests that learning could be related to capabilities (Dremel et al., 2020; Hartl, 2019), it is surprising that no study to date has argued a clear association among the variables in our model. Institutionalising a continuous learning environment in the firm thus connects DT capabilities to organisational commitment. At the same time, our findings help to solve the problem of increased resistance to change that accompanies DT (Plekhanov et al., 2022). The results support the idea that continuous learning in the workforce provides an opportunity for both employees and the organisation (Osmundsen, 2020; Tabrizi et al., 2019), a chance to use DT capabilities to foster organisational commitment.

In conclusion, this new theorising contributes to the DT perspective by advancing future research and clarifying the complex impact of DT capabilities on organisational commitment via two mediators. We identify a starting point from which to explore further mediators and factors of influence between the organisational and individual levels. We also advance understanding of the role of digital leadership and continuous learning environment in the context of DT. Finally, we contribute to the literature on the three-component model of commitment by conceptualising organisational commitment in the context of DT.

Our study develops a new approach to DT research by illuminating a path to an important emerging individual frontier. The organisational level is insufficient to advance DT research because DT strongly impacts the individual level, and sustainable competitive advantage requires employees to remain committed to the firm. We show that DT and the changes it brings are related to the individual frontier because individuals respond to change. The theorising in this study thus differs from prior DT literature in choosing a new level of analysis. As IS research to date has explored DT mainly from an organisational perspective (e.g., firm performance, innovation success), it has only explored the organisational level. Our study identifies bias in DT outcomes due to insufficient study of the individual level (Besson & Rowe, 2012). The three-component model of organisational commitment provides a framework to relate these mediators' positive impact on organisational commitment. Our research differs from previous views in its clear-cut focus on the impact of individual factors that go beyond attitudes, including actual behaviour and actions.

Analyzing the individual frontier advances DT research and opens new paths for future research by considering actual behaviour and responses to change. Our theorising in the context of DT contributes to IS research by questioning previous approaches to DT research. This paper is seminal in going beyond the strategic level of DT and

creating a bridge between the organisation and the individual perspective, opening multiple new paths for future DT research. This individual frontier provides a new approach to DT research and charts a path for future research on actual behaviour and responses to DT. Future IS research can, for example, extend this individual frontier by exploring how past experiences, perceptions, characteristics, and personalities contribute to the transition to a new organisational identity. Further studies could explore how employee attitudes and behaviour impact individual productivity and innovation. The evidence we provide on the role of human elements also encourages future research on factors that impact the individual level in organisations. Moreover, since incorporating an OB perspective highlights the role of learning, follow-up research could explore how employees use a new organisational identity to customise their learning and development experiences for specific skills or abilities. Such research could include exploring how diverse perspectives and experiences contribute to digital innovation and success and examining how organisations create inclusive and supportive environments for employees. Even beyond research paths emerging from this study's specific findings, its results provide a foundation for investigating the role of individual perceptions in the context of DT.

6.2 | Practical contribution

In addition to its theoretical insights, this study contributes valuable practical implications and lessons for organisations in the context of DT. Organisations can translate the findings into concrete actions by creating structures to foster employees' commitment when DT capabilities are present—that is, by emphasising the importance of digital leadership and a continuous learning environment.

First, to guarantee the development of DT capabilities, organisations must start with a clear strategy to ensure that the initiatives are scalable. Such a strategy includes embracing and fostering a culture in which digital solutions are considered wherever possible (i.e., a digital-first mindset) by exploring solely digital opportunities—for example, by attending fairs and workshops on trends and emerging technologies on the market. Organisations are advised to prioritise adopting digital solutions and to allocate resources for DT initiatives (i.e., digitised practices and operations) through automation or monitoring operations. Next, firms must enable employees with digital experiences and encourage widespread and independent participation in DT initiatives by establishing a comprehensive assessment and incubation programme (i.e., empowered talent). Finally, organisations must leverage data for decision-making (i.e., data access and collaboration tools) by using real-time operations data and offering communication, feedback, and collaboration tools so employees can flexibly compute data.

Second, organisations must invest in digital leadership to ensure their leaders have the skills and knowledge to benefit from DT capabilities while facilitating organisational commitment. One way is to implement training in the form of a leadership development programme so that facilitators can demonstrate successful case studies of DT, demonstrate tangible situations directly, or even incorporate role plays so leaders can practice situations they encounter in the DT context. Based on the organisation's findings, we recommend that training cover essential characteristics such as being transparent about DT initiatives and making employees aware of the changes in the organisation. To increase employees' understanding of DT, a digital leader can demonstrate its impact and purpose to positively influence employees' intention to stay (Schrage et al., 2021). At the same time, a digital leader should address and mitigate employees' potential DT-related fears (e.g., being replaced by technologies) to enhance organisational commitment (Meyer et al., 2002).

Third, firms must support a continuous learning environment by providing internal and external opportunities to learn and grow in the context of DT. Continuous learning requires application in an open, experimentation-friendly environment (Mueller & Renken, 2017). Innovation and creativity can be achieved through workshops or hackathons, increasing employee satisfaction. Support mechanisms, feedback, and recognition should also be available to employees through rewards or appreciation as part of the learning process to increase loyalty towards the firm (Osmundsen, 2020). Such activities enable employees to see their own achievements and investments in DT. Finally,

the firm should encourage employees to take ownership through individual learning paths like buddy or mentorship programmes.

Ultimately, our study's contributions can help firms successfully navigate DT's challenges to build a sustainable workforce committed to the organisation. These implications yield practical advice on exploiting DT capabilities from different viewpoints and facilitate organisational commitment.

6.3 | Limitations

Despite the valuable theoretical and practical contributions, this study has some limitations. First, the findings are based only on medium-to-large-sized firms in selected industries in Spain. This limitation provides research opportunities to determine whether the results can be replicated in other sectors and countries through comparative studies or studies of organisations at different stages of DT. Additional research could use the digital competitiveness ranking to select countries with different resources for future readiness, knowledge, and technology. Future studies could also examine the different perspectives of key informants in greater depth in a similar study set-up. Second, as our study data are limited to CDOs' perspectives, the extent of digital leadership could be assessed or validated with additional measures, especially when focusing on the individual frontier. Such studies could include different views in the organisational context, such as insights from employees or middle and top management. Such analysis would also increase awareness of individuals' perspectives in the context of DT across IS research.

Additionally, as DT is a dynamic process, conducting longitudinal studies that analyze changes in DT over time may produce more accurate measures of the construct. Investigating other mediating variables could guide upcoming research. For instance, exploring the influence of the organisation's digital culture (e.g., shared values or beliefs) or employees' expertise and abilities in the model could advance IS research. Further investigation of potential reverse causality, in which organisational commitment may influence DT rather than vice versa, is also critical to advancing understanding in DT research. Although we conducted an endogeneity test by means of Gaussian copulas, the results of endogeneity tests for samples under 1000 are not entirely definitive and reliable and should be interpreted with caution (Becker et al., 2022). Additional research could extend this line of inquiry.

Finally, future research on organisational commitment in the context of DT could improve understanding of how unsuccessful DT impacts employees' commitment and how such impact is relevant to accomplishing goals over time. Further research could also explore how the operationalization of DT capabilities develops a comprehensive framework for DT success. Overall, our study outlines a promising path for research to address the challenge of organisational commitment and explore the individual frontier.

7 | CONCLUSION

Our research responds to recent calls from practitioners and academics to explore the individual frontier in the context of DT. It reveals how to bind employees to a new organisational identity and chart a path for DT research on a new level of analysis. The study sheds light on the individual frontier by testing a model in which digital leadership and a continuous learning environment mediate the impact of DT capabilities on organisational commitment. This empirical study with data from Spain contributes to the IS literature by exploring the mediators between DT capabilities and organisational commitment and advancing understanding of the role of the two mediators—digital leadership and continuous learning environment. By identifying these two mediators, we both position organisational commitment in the context of DT and open an unexplored frontier of DT research by introducing the individual level. The discussion of this new approach to the phenomenon charts promising paths for future research. Finally, the results have great practical value in their implications for ways organisations can explore the boundary conditions of the individual frontier.

FUNDING INFORMATION

This publication has been funded by grant C-SEJ-148-UGR23 funded by Consejería de Universidad, Investigación e Innovación and by "ERDF A way of making Europe".

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Pauline Weritz https://orcid.org/0000-0002-4793-1609
Jorge Matute https://orcid.org/0000-0002-2402-327X

REFERENCES

Abhari, K., Ostroff, C., Barcellos, B., & Williams, D. (2021). Co-governance in digital transformation initiatives: The roles of digital culture and employee experience. In Proceedings of the Hawaii International Conference on System Sciences.

Aroles, J., Cecez-Kecmanovic, D., Dale, K., Kingma, S. F., & Mitev, N. (2021). New ways of working (NWW): Workplace transformation in the digital age. *Information and Organization*, *31*(4), 100378. https://doi.org/10.1016/j.infoandorg.2021.100378

Asatiani, A., Hamalainen, J., & Rossi, M. (2021). Constructing continuity across the organizational culture boundary in a highly virtual work environment. *Information Systems Journal*, *31*(1), 62–93. https://doi.org/10.1111/isj.12293

Baiyere, A., Grover, V., Lyytinen, K. J., Woerner, S., & Gupta, A. (2023). Digital "x" Charting a path for digital-themed research. *Information Systems Research.*, *34*, 463–486.

Baiyere, A., Salmela, H., & Tapanainen, T. (2020). Digital transformation and the new logics of business process management. *European Journal of Information Systems*, *29*(3), 238–259. https://doi.org/10.1080/0960085X.2020.1718007

Bala, H., & Bhagwatwar, A. (2018). Employee dispositions to job and organization as antecedents and consequences of information systems use. *Information Systems Journal*, *28*(4), 650–683. https://doi.org/10.1111/isj.12152

Becker, J., Proksch, D., & Ringle, C. (2022). Revisiting Gaussian copulas to handle endogenous regressors. *Journal of the Academy of Marketing Science*, *50*(1), 46–66.

Benbya, H., Nan, N., Tanriverdi, H., & Yoo, Y. (2020). Complexity and information systems research in the emerging digital world. *MIS Quarterly*, *44*(1), 1–17.

Benitez, J., Arenas, A., Castillo, A., & Esteves, J. (2022). Impact of digital leadership capability on innovation performance: The role of platform digitization capability. *Information & Management*, *59*(2), 103590.

Benitez, J., Henseler, J., Castillo, A., & Schuberth, F. (2020). How to perform and report an impactful analysis using partial least squares: Guidelines for confirmatory and explanatory IS research. *Information & Management*, *57*(2), 116. https://doi.org/10.1016/j.im.2019.05.003

Benitez, J., Ray, G., & Henseler, J. (2018). Impact of information technology infrastructure flexibility on mergers and acquisitions. *MIS Quarterly*, *42*(1), 25–44. https://doi.org/10.25300/MISQ/2018/13245

Besson, P., & Rowe, F. (2012). Strategizing information systems-enabled organizational transformation: A transdisciplinary review and new directions. *Journal of Strategic Information Systems*, *21*(2), 103–124. https://doi.org/10.1016/j.jsis.2012.05.001

Bonnet, D., Puram, A. D., Buvat, J., Subrahmanyam, K. V. J., & Khadikar, A. (2015). Organizing for digital: Why digital dexterity matters. *Capgemini Consulting*, *16*, 1–17.

Bonnet, D., & Westerman, G. (2020). The new elements of digital transformation. *MIT Sloan Management Review*, *62*(2), 82–89.

Bovey, W. H., & Hede, A. (2001). Resistance to organisational change: The role of defence mechanisms. *Journal of Managerial Psychology*, *16*(7), 534–548.

Büchler, N., ter Hoeven, C. L., & van Zoonen, W. (2020). Understanding constant connectivity to work: How and for whom is constant connectivity related to employee well-being? *Information and Organization*, *30*(3), 100302. https://doi.org/10.1016/j.infoandorg.2020.100302

Buil, I., Martínez, E., & Matute, J. (2019). Transformational leadership and employee performance: The role of identification, engagement and proactive personality. *International Journal of Hospitality Management*, *77*(1), 64–75. https://doi.org/10.1016/j.ijhm.2018.06.014

Carroll, N., Conboy, K., Hassan, N. R., Hess, T., Junglas, I., & Morgan, L. (2023). Problematizing assumptions on digital transformation research in the information systems field. *Communications of the Association for Information Systems*, *53*(1), 15.

Cegarra-Navarro, J. G., Wensley, A. K., Martinez-Martinez, A., & Garcia-Perez, A. (2020). Linking organisational commitment with continuous learning through peripheral vision and procedural memory. *European Management Journal*, *38*(6), 874–883.

Chan, C., Teoh, S., & Pan, G. (2019). Agility in responding to disruptive digital innovation: Case study of an SME. *Information Systems Journal*, *29*(2), 436–455. https://doi.org/10.1111/isj.12215

Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *MIS Quarterly*, *36*, 1165–1188.

Cho, S., Johanson, M. M., & Guchait, P. (2009). Employees intent to leave: A comparison of determinants of intent to leave versus intent to stay. *International Journal of Hospitality Management*, *28*(3), 374–381. https://doi.org/10.1016/j.ijhm.2008.10.007

Choi, D., Oh, I. S., & Colbert, A. E. (2015). Understanding organizational commitment: A meta-analytic examination of the roles of the five-factor model of personality and culture. *Journal of Applied Psychology*, *100*(5), 1542–1567. https://doi.org/10.1037/apl0000014

de Medeiros, M. M., & Macada, A. C. G. (2022). Competitive advantage of data-driven analytical capabilities: The role of big data visualization and of organizational agility. *Management Decision*, *60*(4), 953–975.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, *125*(6), 627–668.

Dery, K., Sebastian, I. M., & van der Meulen, N. (2017). The digital workplace is key to digital innovation. *MIS Quarterly Executive*, *16*(2), 135–152.

Dremel, C., Herterich, M. M., Wulf, J., & Vom Brocke, J. (2020). Actualizing big data analytics affordances: A revelatory case study. *Information & Management*, *57*(1), 103121.

Eberl, J. K., & Drews, P. (2021). Digital leadership–mountain or molehill? A literature review. In *Innovation through information systems: Volume III: A collection of latest research on management issues* (pp. 223–237). Wirtschaftsinformatik 2021 Proceedings.

El Sawy, O. A., Kræmmergaard, P., Amsinck, H., & Vinther, A. L. (2016). How LEGO built the foundations and enterprise capabilities for digital leadership. *MIS Quarterly Executive*, *15*(2), 174–201.

Eom, M. T., Wu, W. W., Preston, D. S., & Luftman, J. N. (2020). Effective IT project leadership. *MIS Quarterly Executive*, *19*(2), 141–166. https://doi.org/10.17705/2msqe.00029

European Commission. (2020). The Digital Economy and Society Index (DESI). https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=72352

Fang, Y., Neufeld, D., & Zhang, X. (2022). Knowledge coordination via digital artefacts in highly dispersed teams. *Information Systems Journal*, *32*(3), 520–543. https://doi.org/10.1111/isj.12358

Gurbaxani, V., & Dunkle, D. (2019). Gearing up for successful digital transformation. *MIS Quarterly Executive*, *18*(3), 209–220. https://doi.org/10.17705/2msqe.00017

Hansen, A. M., Kraemmergaard, P., & Mathiassen, L. (2011). Rapid adaptation in digital transformation: A participatory process for engaging IS and business leaders. *MIS Quarterly Executive*, *10*(4), 175–185.

Hartl, E. (2019). A characterization of culture change in the context of digital transformation. In Proceedings of the Americas Conference on Information Systems.

Henseler, J. (2017). Bridging design and behavioral research with variance-based structural equation modeling. *Journal on Advertising*, *46*(1), 178–192. https://doi.org/10.1080/00913367.2017.1281780

Henseler, J., & Dijkstra, T. (2015). ADANCO 2.1 professional for windows, composite modeling, Kleve, Germany. http://www.composite-modeling.com/

Henseler, J., Dijkstra, T., Sarstedt, M., Ringle, C., Diamantopoulos, A., Straub, D., Ketchen, D., Hair, F., Hult, G., & Calatone, R. (2014). Common beliefs and reality about PLS: Comments on Ronkko and Evermann (2013). *Organizational Research Methods*, *17*(2), 182–209. https://doi.org/10.1177/1094428114526928

Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, *15*(2), 123–139.

Hinings, B., Gegenhuber, T., & Greenwood, R. (2018). Digital innovation and transformation: An institutional perspective. *Information and Organization*, *28*(1), 52–61. https://doi.org/10.1016/j.infoandorg.2018.02.004

Hobert, S., Edler, A., Jokisch, C., & Busse, J. (2022). Improve your modeling skills with the help of your peers. In Proceedings of the Americas Conference on Information Systems.

Hult, G., Hair, J., Jr., Proksch, D., Sarstedt, M., Pinkwart, A., & Ringle, C. (2018). Addressing endogeneity in international marketing applications of partial least squares structural equation modeling. *Journal of International Marketing*, *26*(3), 1–21.

International Institute for Management Development. (2022). World Digital Competitiveness Ranking. Accessed on 23rd of May 2023 from https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-digital-competitiveness-ranking/

Jackson, T. A., Meyer, J. P., & Wang, X. H. (2013). Leadership, commitment, and culture: A meta-analysis. *Journal of Leadership & Organizational Studies*, *20*(1), 84–106. https://doi.org/10.1177/1548051812466919

James, T. L., Wallace, L., & Deane, J. K. (2019). Using organismic integration theory to explore the associations between users' exercise motivations and fitness technology feature set use. *MIS Quarterly*, *43*(1), 287–312.

Kaganer, E., Gregory, R. W., & Sarker, S. (2023). A process for managing digital transformation: An organizational inertia perspective. *Journal of the Association for Information Systems*, *24*(4), 1005–1030.

Kane, G. C., Nanda, R., Phillips, A. N., & Copulsky, J. R. (2021). *The transformation myth: Leading your organization through uncertain times*. MIT Press.

Kane, G. C., Palmer, D., Phillips, A. N., & Kiron, D. (2017). Winning the digital war for talent. *MIT Sloan Management Review*, *58*(2), 17–19.

Kane, G. C., Phillips, A. N., Copulsky, J. R., & Andrus, G. R. (2019). *The technology fallacy: How people are the real key to digital transformation*. MIT Press.

Kensbock, J. M., & Stöckmann, C. (2021). "Big brother is watching you": Surveillance via technology undermines employees' learning and voice behavior during digital transformation. *Journal of Business Economics*, *91*(4), 565–594.

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal*, *28*(1), 227–261.

Kunisch, S., Menz, M., & Langan, R. (2022). Chief digital officers: An exploratory analysis of their emergence, nature, and determinants. *Long Range Planning*, *55*(2), 101999.

Lee, J., Keil, M., & Wong, K. (2021). When a growth mindset can backfire and cause escalation of commitment to a troubled information technology project. *Information Systems Journal*, *31*(1), 7–32. https://doi.org/10.1111/isj.12287

Li, W., Phang, S. Y., Choi, K. W. S., & Ho, S. Y. (2021). The strategic role of CIOs in IT controls: IT control weaknesses and CIO turnover. *Information & Management*, *58*(6), 103429.

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly*, *35*, 293–334.

Maier, C., Thatcher, J. B., Grover, V., & Dwivedi, Y. K. (2023). Cross-sectional research: A critical perspective, use cases, and recommendations for IS research. *International Journal of Information Management*, *70*, 102625.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, *2*(1), 71–87. https://doi.org/10.1287/orsc.2.1.71

Markus, M. L., & Rowe, F. (2023). The digital transformation conundrum: Labels, definitions, phenomena, and theories. *Journal of the Association for Information Systems*, *24*(2), 328–335.

McCarthy, P., Sammon, D., & Alhassan, I. (2021). Digital transformation leadership characteristics: A literature analysis. *Journal of Decision Systems*, *32*(1), 1–31.

Meyer, J. P., & Allen, N. J. (1997). *Commitment in the workplace: Theory, research, and application*. Sage Publications.

Meyer, J. P., Allen, N. J., & Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology*, *78*(4), 538–551. https://doi.org/10.1037/0021-9010.78.4.538

Meyer, J. P., & Herscovitch, L. (2001). Commitment in the workplace: Toward a general model. *Human Resource Management Review*, *11*(3), 299–326. https://doi.org/10.1016/S1053-4822(00)00053-X

Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior*, *61*(1), 20–52. https://doi.org/10.1006/jvbe.2001.1842

Ministry of Economic Affairs and Digital Transformation. (2021). DIGITAL SPAIN 2025. https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210204_Digital_Spain_2025.pdf

Mueller, B., & Renken, U. (2017). Helping employees to be digital transformers: The Olympus.connect case. In Proceedings of the International Conference on Information Systems.

Nadkarni, S., & Prügl, R. (2021). Digital transformation: A review, synthesis and opportunities for future research. *Management Review Quarterly*, *71*, 233–341.

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scale development in the social sciences: Issues and applications*. Sage Publications.

Noesgaard, M. S., Nielsen, J. A., Jensen, T. B., & Mathiassen, L. (2023). Same but different: Variations in reactions to digital transformation within an organizational field. *Journal of the Association of Information Systems.*, *24*, 12–34.

Osmundsen, K. (2020). Competences for digital transformation: Insights from the Norwegian energy sector. In Proceedings of the Hawaii International Conference on System Sciences.

Ostmeier, E., & Strobel, M. (2022). Building skills in the context of digital transformation: How industry digital maturity drives proactive skill development. *Journal of Business Research*, *139*, 718–730.

Plekhanov, D., Franke, H., & Netland, T. H. (2022). Digital transformation: A review and research agenda. *European Management Journal*, *41*(6), 821–844.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903.

Rigdon, E. E., Sarstedt, M., & Ringle, C. M. (2017). On comparing results from CB-SEM and PLS-SEM: Five perspectives and five recommendations. *Marketing: ZFP–Journal of Research and Management*, *39*(3), 4–16.

Rivard, S. (2014). *Editor's comments: The ions of theory construction*. MIS Quarterly.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of market research*. Springer International Publishing.

Schlagwein, D., & Bjorn-Andersen, N. (2014). Organizational learning with crowdsourcing: The revelatory case of LEGO. *Journal of the Association for Information Systems*, *15*(11), 754–778.

Schrage, M., Pring, B., Kiron, D., & Dickerson, D. (2021). The transformational power of recommendation. *MIT Sloan Management Review*, *62*(2), 17–21.

Seo, M. G., Taylor, M. S., Hill, N. S., Zhang, X., Tesluk, P. E., & Lorinkova, N. M. (2012). The role of affect and leadership during organizational change. *Personnel Psychology*, *65*(1), 121–165.

Shao, Z., Li, X., & Wang, Q. (2022). From ambidextrous learning to digital creativity: An integrative theoretical framework. *Information Systems Journal*, *32*(3), 544–572.

Shmueli, G. (2010). To explain or to predict? *Statistical Science*, *25*(3), 289–310.

Shore, L. M., Barksdale, K., & Shore, T. H. (1995). Managerial perceptions of employee commitment to the organization. *Academy of Management Journal*, *38*(6), 1593–1615.

Shore, T. H., Bommer, W. H., & Shore, L. M. (2008). An integrative model of managerial perceptions of employee commitment: Antecedents and influences on employee treatment. *Journal of Organizational Behavior*, *29*(5), 635–655.

Singh, A., & Hess, T. (2017). How Chief Digital Officers promote the digital transformation of their companies. *MIS Quarterly Executive*, *16*(1), 1–17.

Soh, C., Yeow, A., Goh, Q., & Hansen, R. (2019). Digital transformation: Of paradoxical tensions and managerial responses. In Proceedings of the International Conference on Information Systems.

Soluk, J., & Kammerlander, N. (2021). Digital transformation in family-owned Mittelstand firms: A dynamic capabilities perspective. *European Journal of Information Systems*, *30*(6), 676–711. https://doi.org/10.1080/0960085X.2020.1857666

Song, J. H., Joo, B. K., & Chermack, T. J. (2009). The dimensions of learning organization questionnaire (DLOQ): A validation study in a Korean context. *Human Resource Development Quarterly*, *20*(1), 43–64. https://doi.org/10.1002/hrdq.20007

Steininger, D. M., Mikalef, P., Pateli, A., & Ortiz-de-Guinea, A. (2022). Dynamic capabilities in information systems research: A critical review, synthesis of current knowledge, and recommendations for future research. *Journal of the Association for Information Systems*, *23*(2), 447–490.

Sundermeier, J. (2022). Lessons for and from digital workplace transformation in times of crisis. *MIS Quarterly Executive*, *21*(4), 5.

Tabrizi, B., Lam, E., Girard, K., & Irvin, V. (2019). Digital transformation is not about technology. *Harvard Business Review*, *13*(3), 1–6.

Tannenbaum, S. I. (1997). Enhancing continuous learning: Diagnostic findings from multiple companies. *Human Resource Management*, *36*(4), 437–452.

Tanriverdi, H., & Uysal, V. (2015). When IT capabilities are not scale-free in merger and acquisition integrations: How do capital markets react to it capability asymmetries between acquirer and target? *European Journal of Information Systems*, *24*(2), 145–158. https://doi.org/10.1057/ejis.2013.22

Tumbas, S., Berente, N., & vom Brocke, J. (2017). Three types of Chief Digital Officers and the reasons organizations adopt the role. *MIS Quarterly Executive*, *16*(2), 121–134.

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, *122*, 889–901.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, *28*(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Warner, K. S., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning*, *52*(3), 326–349. https://doi.org/10.1016/j.lrp.2018.12.001

Watkins, K. E., & Marsick, V. J. (1993). *Sculpting the learning organization: Lessons in the art and science of systemic change*. Jossey-Bass Inc.

Weber, E., Büttgen, M., & Bartsch, S. (2022). How to take employees on the digital transformation journey: An experimental study on complementary leadership behaviors in managing organizational change. *Journal of Business Research*, *143*, 225–238.

Weritz, P., Braojos, J., & Matute, J. (2020). Exploring the antecedents of digital transformation: Dynamic capabilities and digital culture aspects to achieve digital maturity. In Proceedings of the Americas Conference on Information Systems.

Weritz, P., Matute, J., Braojos, J., & Kane, J. (2022). How much digital is too much? A study on employees' hybrid workplace preferences. In Proceedings of the International Conference on Information Systems.

Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J., & Blegind-Jensen, T. (2021). Unpacking the difference between digital transformation and IT-enabled organizational transformation. *Journal of the Association for Information Systems*, *22*(1), 102–129. https://doi.org/10.17705/1jais.00655

Whetten, D. A. (1989). What constitutes a theoretical contribution? *Academy of Management Review*, *14*(4), 490–495.

Zimmer, M. P., Baiyere, A., & Salmela, H. (2023). Digital workplace transformation: Subtraction logic as deinstitutionalising the taken-for-granted. *Journal of Strategic Information Systems*, *32*(1), 101757.

AUTHOR BIOGRAPHIES

Jessica Braojos is an assistant professor of IS at the University of Granada, Granada, Spain. She holds a PhD in Business Administration (with a concentration in IS) from the University of Granada. Jessica's research interests cover how firms can select and leverage social media to create and capture business value. Her research has been published in the *Journal of the Association for Information Systems*, *Information & Management*, *Journal of Business Research*, *International Journal of Information Management*, and *International Journal of Hospitality Management*, and presented at top conferences such as the *Academy of Management Annual Meeting*, *Americas Conference on Information Systems*, *Pacific Asia Conference on Information Systems*, and the *Annual Conference of the European Decision Sciences Institute*.

Pauline Weritz is an assistant professor for Organizational Behavior, Change Management, and Consultancy in the Industrial Engineering and Business Information Systems Department at the University of Twente, Enschede, The Netherlands. She obtained a PhD (cum laude) in Business, Innovation, and Sustainability from Ramon Llull University, Barcelona, Spain, and was a visiting researcher in the IS Department at Boston College. With her background in Psychology and Management, Pauline's research focuses on the interface of IS, Organizational Behavior, and Entrepreneurship. In her doctoral dissertation, she explores critical variables for digital transformation success and thereby draws on the human perspective of technology implementation. Her work has been published in peer-review journals such as *Business Strategy and the Environment* and presented at conferences such as the *International Conference on Information Systems*, *the Americas Conference on Information Systems*, the *Annual Conference of the German Academic Association of Business Research*.

Jorge Matute obtained his PhD from the University of Zaragoza and is currently an associate professor of Marketing at IQS School of Management (Ramon Llull University). His research interests include consumer behaviour in services marketing, online and digital marketing, sustainability, and tourism marketing. He is an expert in Structural Equation Modeling. He has published papers in several journals such as *Journal of Services Marketing*, *Journal of Business and Industrial Marketing*, *Corporate Social Responsibility and Environmental Management*, *Industrial Management & Data Systems*, *Journal of Business Ethics*, *and Tourism Management*.

How to cite this article: Braojos, J., Weritz, P., & Matute, J. (2024). Empowering organisational commitment through digital transformation capabilities: The role of digital leadership and a continuous learning environment. *Information Systems Journal*, *34*(5), 1466–1492. https://doi.org/10.1111/isj.12501

APPENDIX A

TABLE A1 Measurement model evaluation.

Construct/indicator: From 1 to 5 (1: Strongly disagree, 5: Strongly agree)	Mean	SD	VIF	Weight	Loading
Digital transformation capabilities (Second-order Construct)					
Digital-first mindset (Composite Mode B)			3.337	0.281***	0.896***
We take advantage of digital solutions wherever possible.	4.074	0.706	3.024	0.468***	0.940***
People naturally think of digital technologies when we consider ways to improve.	3.615	0.849	2.586	0.197†	0.849***
We prioritise digital solutions.	3.740	1.046	2.692	0.198ns	0.854***
We openly explore digital opportunities.	3.903	0.991	2.439	0.261*	0.856***
Digitised practices and operations (Composite Mode B)			2.750	0.281***	0.872***
Our core operational processes are automated and digitised.	3.587	1.014	2.691	0.230*	0.858***
We monitor our operations in real time.	3.464	1.028	2.312	0.182ns	0.807***
We employ data-driven decision-making.	3.622	1.074	2.247	0.428***	0.901***
We standardise processes that require human input.	3.579	1.012	1.869	0.325***	0.832***
Empowered talent (Composite Mode B)			3.083	0.281***	0.887***
We have experience with new technologies like mobile devices and applications, social media tools and data, big data and advanced analytics, artificial intelligence, machine learning, and internet of things.	3.694	0.886	2.069	0.180ns	0.800***
Digital skills are widely distributed across.	3.500	1.049	2.218	0.488***	0.918***
We have the skills necessary to conduct digital initiatives.	3.682	1.081	2.250	0.450***	0.907***
Data access and collaboration tools (Composite Mode B)			3.223	0.281***	0.898***
We have an increased use of real-time customer and operations data.	3.705	1.188	3.393	0.278*	0.874***
We have an increased use of integrated end-user data.	3.544	0.984	3.519	0.299**	0.886***
We have communication, feedback, and collaboration tools that make it easy to be productive.	3.737	0.976	2.407	0.429***	0.896***
We can access flexible computing power and storage (e.g., through cloud services and external assets).	3.892	0.978	1.946	0.147ns	0.748***
Digital leadership (Composite Mode A)					
Communicates a clear and digital vision for the digital future.	3.475	0.979	4.187	0.211***	0.908***
Supports and encourages the employees' digital mindset and development.	3.522	1.122	6.004	0.208***	0.940***
Gives encouragement for the organisational digital transformation.	3.617	1.113	5.548	0.211***	0.934***
Is clear about the values and practices for the digital transformation.	3.583	1.127	6.473	0.222***	0.945***
Instils pride and respect in others and inspires employees by being digitally competent.	3.631	1.089	5.835	0.220***	0.939***
Continuous learning environment (Composite Mode B)					
In my company employees help each other to learn.	3.836	0.913	2.284	0.355**	0.884***
My company takes time to support learning.	3.552	0.967	3.035	0.512***	0.948***
Employees are rewarded for learning.	2.964	1.132	2.684	0.232*	0.869***

(Continues)

TABLE A1 (Continued)

Construct/indicator: From 1 to 5 (1: Strongly disagree, 5: Strongly agree)	Mean	SD	VIF	Weight	Loading
Organisational commitment (Composite Mode A): Relative to competitors during the last 3 years					
We have less staff turnover.	3.233	0.849	2.129	0.169***	0.729***
We have less staff absenteeism.	3.554	1.179	1.961	0.192***	0.711***
All employees feel like a 'part of the family'.	3.342	0.982	4.697	0.273***	0.907***
We feel a strong sense of 'belonging'.	3.419	1.126	5.484	0.282***	0.930***
The employees desire and intend to stay.	3.556	1.124	3.830	0.258***	0.893***

$^{\dagger}p < 0.10$;
$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

TABLE A2 Correlation matrix.

Construct	1	2	3	4	5	6
1. Digital transformation capabilities	1					
2. Digital leadership	0.810	1				
3. Continuous learning environment	0.701	0.742	1			
4. Organisational commitment	0.563	0.650	0.681	1		
5. Firm size	0.137	0.101	0.076	0.095	1	
6. Industry	0.259	0.186	0.119	0.057	0.164	1

TABLE A3 Post-hoc analysis.

Beta coefficient	Moderation model
Digital transformation capabilities → Organisational commitment	0.027^{ns} (0.220) [−0.180, 0.242]
Digital leadership capabilities → Organisational commitment (Hypothesis 1b)	0.285* (2.225) [0.022, 0.522]
Continuous learning environment → Organisational commitment (Hypothesis 2b)	0.448*** (4.051) [0.224, 0.657]
Digital transformation capabilities × Digital leadership → Organisational commitment	−0.142^{ns} (−1.135) [−0.342, 0.075]
Digital transformation capabilities × Continuous learning environment → Organisational commitment	0.124^{ns} (1.052) [−0.081, 0.310]
Control variables	
Firm size → Organisational commitment (control variable)	0.042^{ns} (0.838) [−0.066, 0.133]
Industry → Organisational commitment (control variable)	−0.073^{ns} (0.920) [−0.166, 0.146]

	R^2	Adjusted R^2
Organisational commitment	0.517	0.494

Overall model fit of the estimated model	Value	HI_{99}
SRMR	0.051	0.075
d_{ULS}	0.706	1.535
d_G	0.384	0.483

Note: $^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$, two-tailed test for control variables and one-tailed test for the other relationships.

TABLE A4 Gaussian copula analysis.

Beta coefficient	Gaussian copula analysis
Digital transformation capabilities → Digital leadership (Hypothesis 1a)	0.969*** (5.709) [0.616, 1.285]
Digital leadership → Organisational commitment (Hypothesis 1b)	0.337** (2.627) [0.067, 0.569]
Digital transformation capabilities → Continuous learning environment (Hypothesis 2a)	0.765*** (4.611) [0.450, 1.112]
Continuous learning environment → Organisational commitment (Hypothesis 2b)	0.440*** (3.887) [0.197, 0.645]
Digital transformation capabilities → Organisational commitment	−0.010^{ns} (0.042) [−0.469, 0.495]
Control variables	
Firm size → Organisational commitment (control variable)	0.040^{ns} (0.786) [−0.058, 0.138]
Industry → Organisational commitment (control variable)	−0.064^{ns} (1.026) [−0.186, 0.059]
Gaussian copula terms	
Digital transformation capabilities → Digital leadership (GC)	−0.162^{ns} (1.017) [−0.494, 0.140]
Digital transformation capabilities → Continuous learning environment (GC)	−0.064^{ns} (0.396) [−0.466, 0.197]
Digital transformation capabilities → Organisational commitment (GC)	0.003^{ns} (0.016) [−0.379, 0.374]