

Article

The Impact of Digital Transformation on Turnover Intention: The Mediating Role of Employee Engagement

Suad Dukhaykh *, Norah Al-Humaid and Nojoud Al-Ajlan

Management Department, King Saud University, Riyadh 12372, Saudi Arabia

* Correspondence: sdukhaykh@ksu.edu.sa

Abstract

The purpose of this study is to examine the relationship between digital transformation, employee engagement, and turnover intention, with particular emphasis on the mediating role of employee engagement. Using a quantitative research design, data were collected from 240 employees working in public and private sector organizations in Saudi Arabia. Structural Equation Modelling (SEM) was employed to examine the proposed relationships. The findings reveal that employee engagement serves as a significant mediator in the relationship between digital transformation and turnover intention. Specifically, employees reporting higher levels of engagement are less likely to express intentions to leave their organizations during periods of technological change. In contrast, the direct relationship between digital transformation and turnover intention was not statistically significant, indicating a full mediation mechanism. These findings contribute to the literature by enhancing understanding of the human and organizational dimensions of sustainable digital transformation, particularly within emerging economies. The results suggest that the success of digital transformation initiatives depends not only on technological investments but also on fostering employee engagement to support workforce sustainability and long-term organizational resilience. By promoting engagement, organizations can strengthen employee retention, maintain workforce stability, and support sustainable organizational performance during periods of digital change. Consequently, the study highlights employee engagement as a critical mechanism for achieving both digital transformation objectives and broader sustainability goals related to human capital development, employee well-being, and sustainable organizational growth.

Keywords: digital transformation; employee engagement; turnover intention; digital literacy; technostress; digital skill; Saudi Arabia; technological change



Academic Editors: Baiba Rivza and
Rosita Zvirgzdina

Received: 25 April 2026

Revised: 10 June 2026

Accepted: 10 June 2026

Published: 17 June 2026

Copyright: © 2026 by the authors.
Licensee MDPI, Basel, Switzerland.
This article is an open access article
distributed under the terms and
conditions of the [Creative Commons
Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

1. Introduction

The contemporary digital wave has emerged as a powerful driver of transformation, reshaping the modern corporate environment. Digital transformation, defined as the alignment of digital technologies with organizational functions and processes, has significantly altered how organizations operate, communicate, and create value [1]. Technologies such as cloud computing, artificial intelligence, big data analytics, and digital collaboration platforms are increasingly embedded within organizational systems, enabling new forms of operational efficiency, communication, and service delivery [2,3]. The COVID-19 pandemic further accelerated this transition by compelling organizations to adopt remote work arrangements and digital communication practices at an unprecedented scale [4]. Despite the widely recognized strategic and technological benefits of digital transformation [5–7], its

implications for employee-related outcomes remain insufficiently explored. Digital transformation has also become an important enabler of organizational sustainability by supporting more efficient resource utilization, enhancing organizational resilience, and facilitating sustainable business practices in an increasingly dynamic environment. Existing research has predominantly emphasized operational performance, innovation, and technological adoption, while comparatively less attention has been directed toward understanding how digital transformation shapes employees' psychological and behavioral experiences within organizations. In particular, limited research has examined the mechanisms through which digital transformation influences employees' turnover intention, especially within rapidly evolving organizational contexts such as Saudi Arabia and the GCC region. Accordingly, the present study investigates the association between digital transformation and employees' turnover intention, with particular emphasis on the mediating function of employee engagement. Through examining these relationships, the research contributes to a deeper understanding of the workforce implications of digital transformation and its role in supporting workforce sustainability. The study also provides evidence-based recommendations for organizations seeking to sustain employee commitment, strengthen human capital development, and reduce turnover in increasingly digitalized work environments. Employee engagement represents a critical factor in understanding employee responses to organizational transformation. Engagement reflects the emotional, cognitive, and behavioral investment employees bring to their work roles [8,9]. Highly engaged employees typically demonstrate stronger enthusiasm, dedication, and proactive involvement in organizational activities, particularly during periods of uncertainty and change [10]. Prior research consistently shows that engaged employees are less likely to develop turnover intentions because they experience stronger alignment with organizational goals and values [11,12]. At the same time, digital transformation may generate both positive and negative employee experiences. On the one hand, digital technologies can simplify tasks, enhance communication, increase flexibility, and improve collaboration, thereby supporting employee engagement and work effectiveness [2,13]. On the other hand, poorly managed digital transformation initiatives may intensify technostress, role ambiguity, and digital overload, potentially leading to disengagement and withdrawal behaviors [14,15]. Technostress arises when employees struggle to adapt to continuous technological demands due to insufficient technical skills, organizational support, or training opportunities [16,17]. Previous studies have linked technostress to reduced psychological well-being, lower job satisfaction, and weaker organizational commitment [18,19]. These contrasting findings suggest that the impact of digital transformation on employee outcomes is not necessarily direct but may operate through important psychological mechanisms such as employee engagement. Employees are more likely to respond positively to digital transformation when they perceive technological change as supportive, meaningful, and beneficial rather than threatening or exclusionary [20,21]. Therefore, examining employee engagement as a mediating mechanism provides valuable insight into the relationship between digital transformation and turnover intention. The present study contributes to the expanding body of research on digital transformation and employee-related outcomes by enhancing understanding of the indirect associations between these constructs. Furthermore, the findings offer practical guidance for organizations seeking to implement digital transformation initiatives while simultaneously promoting employee well-being, maintaining workforce stability, and supporting sustainable organizational performance. Organizations that support employees through digital training, effective communication, and supportive leadership practices are more likely to foster engagement, reduce turnover intention, and maintain a more adaptable and committed workforce. Such efforts contribute to sustainable

organizational performance by promoting employee well-being, workforce stability, and long-term organizational resilience during periods of digital transformation [19].

2. Literature Review & Hypotheses Development

2.1. Digital Transformation and Employee Engagement

The contemporary business environment is undergoing a profound transformation, with digital transformation emerging as a central component of modern organizational strategies. Digital transformation refers to the comprehensive integration of digital technologies across organizational functions, resulting in improved operational processes, enhanced customer engagement, and strengthened internal collaboration [1]. However, beyond its technological dimension, digital transformation represents a socio-technical process that fundamentally reshapes employees' roles, interactions, and work experiences [22,23]. Despite the extensive attention given to its strategic benefits [5–7], the human implications of digital transformation remain comparatively underexplored, particularly in emerging economies such as Saudi Arabia and the Gulf Cooperation Council (GCC) region. Recent studies in the GCC highlight that rapid digital adoption, driven by national transformation agendas such as Saudi Vision 2030, has intensified the need to understand employee adaptation, engagement, and well-being in digitally evolving workplaces [24,25]. Cultural factors, hierarchical organizational structures, and workforce localization policies further shape how employees perceive and respond to digital transformation in this context. Employee engagement plays a pivotal role in this relationship. Engagement reflects the extent to which employees invest their emotional, cognitive, and behavioral energies in their work roles [8,9]. From a Social Exchange Theory (SET) perspective [26], employees who perceive organizational support through digital tools, training, and flexibility are more likely to reciprocate with higher engagement and commitment. Thus, digital transformation initiatives that enhance employees' work experience can strengthen the exchange relationship between employees and the organization. Similarly, the Technology Acceptance Model (TAM) [27] provides an important theoretical lens for understanding how employees respond to digital transformation. The Technology Acceptance Model (TAM) suggests that employees are more likely to embrace digital technologies when they perceive them as useful and user-friendly. Such perceptions play an important role in shaping employee engagement and subsequent behavioral outcomes within the workplace. When digital tools are perceived as beneficial and user-friendly, employees are more likely to integrate them into their work, leading to higher engagement levels [28]. Empirical studies show mixed findings regarding the impact of digital transformation on engagement. On the one hand, digital tools can enhance engagement by improving task efficiency, enabling autonomy, and facilitating flexible work arrangements [13,29]. These factors contribute to more meaningful work experiences and increased motivation. On the other hand, digital transformation can also generate negative outcomes, particularly when employees experience technostress, role ambiguity, or digital overload [14,15]. This divergence in findings suggests that the relationship between digital transformation and engagement is contingent upon contextual and organizational factors, including leadership support, digital literacy, and access to training resources. In GCC contexts, where digital transformation is often implemented rapidly, the lack of sufficient training and change management practices may amplify technostress and reduce engagement [25]. Therefore, rather than viewing digital transformation as inherently beneficial or detrimental, it is more appropriate to conceptualize it as a dual-edged process, where outcomes depend on how organizations manage the transition. Accordingly, the following hypothesis is proposed:

H1: *Digital transformation positively influences employee engagement.*

2.2. Digital Transformation and Turnover Intention

Turnover intention refers to an employee's conscious willingness to leave the organization and is widely recognized as a strong predictor of actual turnover behavior [30]. Classical turnover literature suggests that employees develop intentions to leave when they experience dissatisfaction, stress, or reduced organizational attachment or perceive more attractive alternatives elsewhere. Mobley et al.'s turnover model [31] explains that turnover intention emerges through a psychological withdrawal process that begins with dissatisfaction and gradually develops into thoughts of quitting and actual turnover behavior. Similarly, Mitchell et al.'s Job Embeddedness Model [32] emphasizes that employees remain in organizations when they experience strong organizational connections, compatibility with organizational values, and perceived sacrifices associated with leaving the organization. While digital transformation enhances organizational efficiency and innovation, it also introduces challenges that may influence employees' intention to leave [33]. From a theoretical perspective, Social Exchange Theory (SET) suggests that employees are more likely to demonstrate stronger organizational commitment when digital transformation initiatives are viewed positively and are accompanied by adequate organizational support. Conversely, when digital transformation increases job demands without adequate support, employees may perceive an imbalance in the exchange relationship, leading to withdrawal behaviors such as turnover intention [34]. Furthermore, Allen et al. [35] highlighted that perceived organizational support and supportive human resource practices play a critical role in reducing turnover intention and strengthening employee retention. In digital transformation contexts, organizational support through training, communication, and employee involvement may reduce uncertainty and facilitate employee adaptation to technological change. Empirical research presents conflicting findings. Some studies suggest that digital transformation reduces turnover intention by enhancing job performance, career opportunities, and organizational support [20]. In contrast, other studies highlight that digital transformation may increase turnover intention due to technostress, job insecurity, and skill obsolescence [15]. These inconsistencies are particularly evident in emerging economies such as Saudi Arabia, where rapid digitalization may outpace employees' ability to adapt. Employees with lower digital competencies may perceive digital transformation as a threat, leading to increased anxiety and turnover intention [35]. Furthermore, from a Technology Acceptance Model (TAM) perspective, employees who perceive digital systems as complex or difficult to use are more likely to experience resistance and dissatisfaction, which may increase their intention to leave. In contrast, when digital tools are perceived as useful and easy to use, they can enhance job satisfaction and reduce turnover intention [28]. These mixed findings highlight a critical gap: the need to understand the underlying mechanisms that explain how digital transformation influences turnover intention. Accordingly, this study proposes the following:

H2: *Digital transformation positively influences turnover intention.*

2.3. Employee Engagement and Turnover Intention

Employee engagement represents a critical mechanism linking digital transformation to turnover intention. According to the Job Demands–Resources (JD-R) model [36], engagement is shaped by the balance between job demands and resources. Digital transformation can increase both: it introduces new demands (e.g., learning technologies) while also providing resources (e.g., flexibility, autonomy). From an analytical perspective, the literature consistently supports a negative relationship between engagement and turnover intention [8,9]. Engaged employees tend to demonstrate stronger emotional attachment, organizational commitment, and willingness to remain within the organization. This re-

relationship is also supported by the Job Embeddedness Model [32], which suggests that employees who experience stronger organizational fit, workplace connections, and meaningful involvement are less likely to leave their organizations. SET further explains this relationship by suggesting that engaged employees develop stronger emotional attachment and loyalty, reducing their intention to leave. In addition, TAM complements this view by explaining how positive experiences with digital tools enhance engagement, which in turn reduces turnover intention. Importantly, recent studies emphasize that engagement acts as a mediating mechanism rather than a direct outcome. While digital transformation alone may not directly influence turnover intention, it shapes engagement, which subsequently determines employees' intention to stay or leave [20]. This perspective helps reconcile contradictory findings in prior research and highlights engagement as a key explanatory variable. Based on the preceding discussion, the following hypotheses are developed:

H3: *Employee engagement negatively influences turnover intention.*

H4: *Employee engagement mediates the relationship between digital transformation and turnover intention.*

Research Model

The conceptual research model illustrated in Figure 1 is developed to depict the relationships among the study variables.

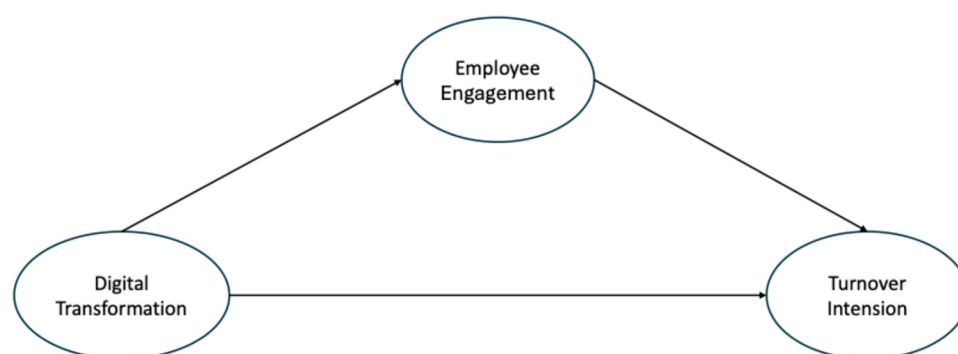


Figure 1. The Research Model.

3. Research Methodology

3.1. Research Instrument Development

This research employed a quantitative approach and collected data through a structured online questionnaire administered via Google Forms. The survey instrument consisted of measurement items adapted from previously validated scales reported in the literature and utilized a five-point Likert response format. To enhance linguistic accuracy and ensure cultural relevance within the Saudi context, a translation and back-translation process was implemented. Initially, the questionnaire was translated from English into Arabic by a qualified bilingual translator familiar with the study objectives and constructs. The Arabic version was then independently translated back into English by a second bilingual expert. Both English versions were subsequently compared, and any inconsistencies were discussed and resolved to ensure that the translated instrument accurately reflected the intended conceptual meanings of the original items. The translated instrument was then reviewed by the researcher to confirm consistency with the original English version. Furthermore, face validity was assessed by a bilingual academic specializing in business studies, who provided minor recommendations that were incorporated into the final version of the questionnaire [37]. The questionnaire was organized into five sections. The first section collected respondents' demographic characteristics, including age, years of

work experience, department affiliation, and level of educational attainment. The second section measured digital transformation practices within organizations. The third section assessed employee engagement. The fourth section examined turnover intention, focusing on participants' intentions to leave their current jobs. The final section evaluated participants' work-related skills, including technical proficiency, communication, problem-solving, teamwork, and time management. All sections, except the demographic section, required respondents to indicate their level of agreement with the provided statements (or level of proficiency in the final section) using appropriate five-point scales.

3.2. Sample and Data Collection

The present study examines the relationships among digital transformation, employee engagement, and turnover intention among employees working in public and private organizations across Saudi Arabia. To obtain data from a broad range of working professionals, a non-probability convenience sampling approach was adopted due to its practicality and accessibility within the available time frame [38]. Although this method facilitated access to participants from different industries and organizational settings, it may have introduced selection bias and reduced the representativeness of the sample. Specifically, the use of online distribution channels and professional networks may have increased the likelihood of participation among individuals who are more digitally connected and technologically engaged. Consequently, caution should be exercised when extending the findings to the wider employee population. Data were collected through a structured online questionnaire administered via a secure survey platform. The survey link was distributed through professional contacts, organizational networks, and social media platforms, including LinkedIn, to reach employees from diverse sectors and hierarchical levels. Participation was voluntary, and no financial or non-financial incentives were provided. Because the questionnaire was accessible through an open survey link, participation was based on self-selection rather than recruitment through a predefined sampling frame. To ensure the relevance of respondents to the research objectives, only individuals who were currently employed and had experience with digital technologies or digital transformation initiatives within their organizations were eligible to participate. Screening questions included at the beginning of the survey were used to verify these criteria, and responses that did not satisfy the eligibility requirements were removed from the dataset. The survey remained open for a designated period, during which responses were continuously monitored until an adequate number of valid observations was obtained for statistical analysis. A total of 260 responses were initially received. Following the screening process, 240 responses were retained for analysis, while incomplete submissions and responses that failed to meet the eligibility criteria were excluded to maintain data quality. The final sample size of 240 respondents was considered suitable for Structural Equation Modelling (SEM), as previous methodological studies suggest that samples exceeding 200 observations generally provide sufficient statistical power and stable parameter estimation. The retained sample included employees with diverse demographic backgrounds in terms of gender, age, education, employment sector, and work experience. Nevertheless, because stratified or quota-based sampling procedures were not employed, full representativeness across sectors, organizational functions, and managerial levels cannot be assured.

3.3. Demographic Profile of the Respondents

The demographic characteristics of the study participants are presented in Table 1 (N = 240). The sample reflects variation across key demographic attributes, suggesting an adequate representation of individuals from different age groups, educational levels, and professional backgrounds. In terms of gender distribution, female respondents constituted

56.7% (n = 136) of the sample, while male respondents accounted for 43.3% (n = 104), enabling meaningful comparative analysis across gender groups. Regarding age, the majority of participants were over 30 years old, with 32.1% (n = 77) aged between 30–35 years and 32.9% (n = 79) aged above 35 years. Younger participants were represented by those aged 25–30 years (20.8%, n = 50) and 20–25 years (14.2%, n = 34). This distribution indicates that most respondents are at relatively advanced stages of their careers, likely contributing to more informed perspectives on organizational change. In terms of educational attainment, the largest proportion of respondents held a bachelor's degree (55%, n = 132), followed by master's degree holders (26.3%, n = 63) and PhD holders (12.9%, n = 31), with a smaller percentage holding diploma qualifications (5.8%, n = 14). This suggests a highly educated sample, which is particularly relevant for examining digital transformation and its implications for employee behavior. With respect to employment sector, 65.4% (n = 157) of respondents were employed in the private sector, while 34.6% (n = 83) worked in the public sector. This distinction provides valuable insights into sectoral differences in the implementation and perception of digital transformation initiatives. Regarding professional experience, the majority of participants reported 7–10 years of experience (44.2%, n = 106), followed by those with 3–5 years (34.2%, n = 82) and 5–7 years (21.7%, n = 52). This indicates that the sample consists predominantly of experienced professionals capable of evaluating organizational practices and technological changes. Overall, the demographic profile reflects a well-educated, experienced, and diverse workforce, making it particularly suitable for examining the complex dynamics of digital transformation and its impact on employee engagement and turnover intention.

Table 1. Sample demographics (N = 240).

Variables	Subgroups	Frequency	Per Cen
Gender	Male	104	43.3
	Female	136	56.7
Age	20–25	34	14.2
	25–30	50	20.8
	30–35	77	32.1
	More than 35	79	32.9
Education	Diploma	14	5.8
	Bachelor	132	55
	Master	63	26.3
	PhD	31	12.9
Industry	Government sector	83	34.6
	private sector	157	65.4
Experience level	3–5 years	82	34.2
	5–7 years	52	21.7
	7–10 years	106	44.2

3.4. Measures

3.4.1. Digital Transformation

As shown in Appendix A, Digital Transformation (DT) was measured using a scale adapted from Fitzgerald et al. [39]. The construct was measured using five dimensions that capture the major components of organizational digital transformation. Technology Integration was assessed through items such as: “Our organization effectively uses

digital tools to improve productivity.” Process Innovation captured the extent to which digital technologies support decision-making processes, for example: “Data analytics are utilized on a regular basis to inform decision-making within our company.” Customer Experience measured the use of digital platforms to enhance customer interaction, as reflected in the item: “We use digital platforms to facilitate engagement with our customers.” Cultural Change assessed the organization’s openness to innovation and experimentation, with items such as: “Employees are encouraged to pilot new digital solutions.” Strategic Alignment evaluated the extent to which digital transformation initiatives align with organizational goals, for instance: “Digital transformation aligns with our overall business strategy.”

Collectively, these dimensions capture the multifaceted nature of digital transformation, including technological adoption, process enhancement, customer engagement, organizational culture, and strategic integration.

3.4.2. Employee Engagement

Employee engagement was measured using the Utrecht Work Engagement Scale (UWES) [40], which conceptualizes engagement as a positive, fulfilling work-related state consisting of three dimensions: vigor, dedication, and absorption. Vigor reflects high levels of energy and mental resilience at work, measured using items such as: “I feel full of energy and motivated when I start my workday.” Dedication captures a sense of significance, enthusiasm, and pride in one’s work, with items such as: “My job is meaningful and gives me a sense of purpose.” Absorption reflects the degree to which employees are fully concentrated and deeply immersed in their work, as illustrated by: “I get deeply involved in my work and focus fully on my tasks.”

3.4.3. Turnover Intention

Turnover intention was measured using the scale developed by Steel and Ovalle [41]. The scale includes items such as: “I often think about quitting my current job,” “If I found a better job opportunity, I would leave my current company,” and “I do not see myself working at this company for the long term.” This measure captures employees’ cognitive withdrawal and their intention to leave the organization, serving as a reliable predictor of actual turnover behavior.

3.5. Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS v.29) to generate descriptive statistics and conduct preliminary data screening procedures. To evaluate the adequacy of the measurement model, Confirmatory Factor Analysis (CFA) was performed using Analysis of Moment Structures (AMOS), allowing assessment of construct reliability and validity. Following the validation of the measurement model, Structural Equation Modelling (SEM) was implemented in AMOS to examine the proposed relationships among the study constructs.

4. Results

4.1. Measurement Model

Confirmatory Factor Analysis (CFA) was conducted to evaluate the validity and reliability of the proposed measurement model, which comprises digital transformation, employee engagement, and turnover intention. The results indicated that the measurement model demonstrated an adequate fit to the data, as presented in Table 2. The standardized factor loadings for all observed indicators were statistically significant ($p < 0.001$) and exceeded the recommended threshold of 0.40, indicating that each item is a reliable indicator

of its respective latent construct. Table 2 reports that the loadings for digital transformation ranged from 0.589 to 0.928, those for employee engagement ranged from 0.575 to 0.876, and those for turnover intention ranged from 0.859 to 0.952. These results provide strong evidence of convergent validity.

Table 2. Confirmatory factor analysis.

Construct	Items	Factor Loading	CR	AVE	MSV
Digital Transformation	DT1	0.648	0.922	0.551	0.330
	DT2	0.647			
	DT3	0.647			
	DT4	0.589			
	DT5	0.734			
	DT6	0.724			
	DT7	0.811			
	DT8	0.928			
	DT9	0.850			
	DT10	0.777			
Employee Engagement	EE1	0.681	0.911	0.566	0.014
	EE2	0.876			
	EE3	0.868			
	EE4	0.844			
	EE5	0.777			
	EE6	0.710			
	EE7	0.575			
	EE8	0.629			
Turnover Intention	TI1	0.859	0.954	0.807	0.343
	TI2	0.911			
	TI3	0.952			
	TI4	0.876			
	TI5	0.891			

To further assess construct reliability and validity, Composite Reliability (CR) and Average Variance Extracted (AVE) were examined. All constructs exhibited CR values above the recommended threshold of 0.70 and AVE values exceeding 0.50. Specifically, digital transformation demonstrated a CR of 0.922 and an AVE of 0.551; employee engagement showed a CR of 0.911 and an AVE of 0.566; and turnover intention exhibited a CR of 0.954 and an AVE of 0.807. In line with the recommendations of Hair et al., the CR values for all constructs exceeded their corresponding AVE values, further supporting the reliability and validity of the measurement model. Overall, these results show that the measurement model is robust and adequately captures the underlying dimensions of the constructs under investigation. Discriminant validity was further assessed using the Maximum Shared Variance (MSV) criterion. According to the recommended threshold, the AVE of each construct should exceed its corresponding MSV value to demonstrate adequate discriminant validity. The overall fit of the measurement model was assessed using several goodness-of-fit indices. As shown in Table 3, the results indicated that the model demonstrated an acceptable to good fit with the observed data.

Table 3. Model fit of confirmatory factor analysis.

χ^2	<i>df</i>	<i>p</i>	CFI	TLI	RMR	90% CI for RMSEA			
						RMSEA	PCLOSE	GFI	AGFI
912.26	402	0.000	0.975	0.959	0.0498	0.041	0.071	0.962	0.881

4.2. Common Method Bias

Common method bias (CMB) was assessed using both statistical and procedural remedies. First, Harman's single-factor test was conducted. The results indicated that a single factor did not account for the majority of the variance, as the first factor explained less than 50% of the total variance. This suggests that common method bias is unlikely to be a serious concern [42].

Second, a more rigorous assessment was performed using the common latent factor (CLF) approach within the structural equation modeling framework. Three nested models were compared: the unconstrained model, the equal loadings model, and the equal-to-zero loadings model. The unconstrained model demonstrated a better fit compared to the nested models. However, further analysis revealed that the inclusion of the CLF did not substantially change the standardized factor loadings or the significance of the structural relationships [43].

These findings indicate that, although some shared variance may exist, common method bias does not significantly threaten the validity of the results. As a conservative approach, the CLF was retained in the structural model to control for potential method effects.

4.3. Hypotheses Testing

4.3.1. Descriptive Analytics

The descriptive statistics among the study variables are presented in Table 4.

Table 4. Mean, Standard Deviation and reliabilities.

Variables	Mean	SD	DT	EE	TI
DT	2.60	0.435	0.925		
EE	3.57	0.604	0.449 **	0.913	
TI	2.52	1.12	−0.055	−0.475 **	0.953

Note: ** $p < 0.01$.

4.3.2. Structural Equation Modeling

Table 5 summarizes the direct, indirect, and overall relationships estimated in the structural model. The results reveal a positive and statistically significant association between digital transformation and employee engagement ($\beta = 0.449$, $p < 0.01$), providing support for H1. However, the direct association between digital transformation and turnover intention was not statistically significant ($\beta = 0.199$, $p > 0.05$); therefore, H2 was not supported. The findings further show that employee engagement is negatively and significantly associated with turnover intention ($\beta = -0.564$, $p < 0.001$), lending support to H3. This indicates that employees who report higher levels of engagement tend to exhibit lower intentions to leave their organization.

4.3.3. Bootstrapping Analysis for Mediation

To assess the significance of the indirect effect and test the mediation hypothesis, a bootstrapping procedure was employed within the structural equation modeling framework. Bootstrapping is recommended as a robust method for mediation analysis, as it does not rely on normality assumptions and provides more accurate estimates of indirect effects.

In this study, a bias-corrected bootstrapping approach with 5000 resamples was conducted. The indirect effect of digital transformation on turnover intention through employee engagement was examined using confidence intervals derived from the bootstrap distribution. The results indicate that the indirect effect is statistically significant ($\beta = -0.254$), as the 95% confidence interval does not include zero, confirming the presence of a mediation effect. This finding supports the hypothesis that employee engagement serves as a key mechanism through which digital transformation influences turnover intention.

Table 5. Structural Equation Modeling Results.

Relationships	Standardized Coefficients
DT $\rightarrow$ EE	0.449 **
EE $\rightarrow$ TI	−0.564 ***
DT $\rightarrow$ TI	0.199
DT $\rightarrow$ EE $\rightarrow$ TI	−0.254 **

Note: ** $p < 0.01$, *** $p < 0.001$.

Figure 2 illustrates the results of the structural model, including the standardized path coefficients among the study variables.

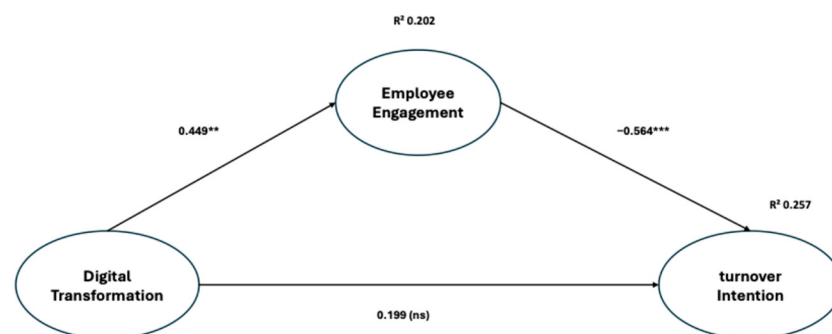


Figure 2. Standardized estimate. Note: ** $p < 0.01$, *** $p < 0.001$. ns = non-significant.

5. Discussion

The findings of this study indicate a complex relationship between digital transformation, employee engagement, and turnover intention, consistent with recent research highlighting the multifaceted impact of digitalization on employee outcomes. Digital transformation appears to influence employee outcomes indirectly rather than directly, as supported by studies showing that technological change often operates through intermediate psychological mechanisms [44,45]. The non-significant direct effect of digital transformation on turnover intention suggests that digital transformation does not inherently lead to employees' intention to leave, which aligns with findings indicating that digital initiatives alone are not sufficient predictors of turnover-related behaviors [45,46]. This finding diverges from studies that report a direct positive relationship between technological change and turnover intention due to increased stress and work pressure [45], but converges with research demonstrating that organizational support and digital readiness can mitigate such negative outcomes [47]. This result is particularly relevant in the Saudi Arabian and broader GCC context, where digital transformation is progressing rapidly under national initiatives such as Vision 2030. Organizations in this region are undergoing accelerated digital change, often accompanied by structured transformation strategies and institutional support, which may reduce the likelihood of negative employee reactions [24,25]. The results further demonstrate that employee engagement plays a central

role in shaping employees' responses to digital transformation, which is consistent with empirical evidence linking engagement to positive workplace outcomes [8,46]. Studies have shown that digital workplace technologies can enhance engagement by improving communication, flexibility, and access to organizational resources. Increased engagement, in turn, has been consistently associated with lower turnover intention, as employees who are more connected to their work are less likely to consider leaving [45,47]. Importantly, the findings suggest that digital transformation contributes to reducing turnover intention only when it enhances employee engagement, which is supported by research demonstrating that engagement acts as a key mechanism linking organizational practices to retention outcomes [8,45]. This helps reconcile conflicting findings in the literature, where some studies report negative effects of digital transformation due to stress, while others highlight positive outcomes when employees are adequately supported. In the Saudi context, organizational efforts to support employees during digital transformation—such as training, communication, and leadership involvement—play a critical role in shaping employee engagement and reducing turnover intention. This suggests that the effectiveness of digital transformation depends less on the technology itself and more on how organizations manage the transition process [47]. Overall, the findings highlight that digital transformation does not directly influence turnover intention but operates through employee engagement as a key explanatory mechanism, consistent with prior research emphasizing the importance of employee-centered approaches in managing organizational change. Interestingly, the findings of the present study differ from prior research such as Poku et al. [48], which reported a partial mediating role of employee engagement. In contrast, the current study found that employee engagement fully accounted for the relationship between digital transformation and turnover intention. This difference may be associated with contextual and organizational characteristics specific to the Saudi Arabian environment. Within the context of Saudi Vision 2030 and the rapid pace of organizational digitalization, employees may rely more heavily on workplace engagement when interpreting technological change. Furthermore, relatively hierarchical organizational structures and collectivist cultural tendencies may strengthen the role of employee engagement as a central mechanism linking employees' perceptions of digital transformation with turnover-related attitudes. Consequently, employee engagement may play a more dominant role in shaping employee retention outcomes within Saudi organizations compared with findings reported in other institutional contexts. Furthermore, the mediating role of employee engagement may vary depending on specific organizational conditions within the Saudi Arabian context. Factors such as leadership support, employee involvement in digital initiatives, organizational readiness for change, and the availability of digital training and technical support may significantly influence how employees perceive and respond to digital transformation. In organizations where communication is transparent and employees are adequately supported throughout the transformation process, digital transformation is more likely to enhance engagement and reduce turnover intention. Conversely, rapid implementation processes, limited employee participation, and insufficient digital preparedness may intensify technostress and weaken employee engagement, thereby increasing withdrawal intentions. These contextual conditions highlight the importance of adopting employee-centered digital transformation strategies within rapidly evolving organizational environments such as those associated with Saudi Vision 2030 initiatives.

6. Implications

The findings of this study offer important theoretical and practical implications that are directly grounded in the empirical results. From a theoretical perspective, this study contributes to the literature by demonstrating that the relationship between digital trans-

formation and turnover intention is not direct but operates through employee engagement. This finding refines existing research by clarifying that digital transformation alone does not determine employee withdrawal behaviors; rather, its impact depends on how it shapes employees' psychological and behavioral states. In doing so, the study advances the understanding of digital transformation by positioning employee engagement as a central mechanism linking technological change to workforce outcomes. From a managerial perspective, the results indicate that the effectiveness of digital transformation initiatives depends less on the adoption of technology itself and more on how these initiatives influence employee engagement. The non-significant direct effect of digital transformation on turnover intention suggests that organizations cannot assume that digital change will automatically lead to negative employee outcomes. Instead, the results highlight that turnover-related outcomes are contingent upon the extent to which employees remain engaged during the transformation process. Accordingly, organizations should focus on designing digital transformation initiatives that actively support employee engagement. This includes ensuring that employees are equipped with the necessary skills to adapt to new technologies, as well as providing structured support mechanisms during the transition. For example, targeted digital training programs, clear communication regarding the purpose and benefits of digital initiatives, and opportunities for employee involvement in the implementation process can enhance engagement and reduce uncertainty. In addition, the findings suggest that organizations should monitor employee responses to digital transformation rather than focusing solely on technological outcomes. Since engagement plays a mediating role, practices that enhance employees' sense of involvement, clarity, and support are likely to be more effective in reducing turnover intention than purely technical interventions. Although the direct relationship between digital transformation and turnover intention was positive but non-significant, the findings indicate that digital transformation may become associated with turnover intention when organizations fail to maintain employee engagement during periods of technological change. Therefore, organizations should complement technological investments with employee-centered strategies such as digital training, supportive leadership, transparent communication, and employee participation in change initiatives. These practices may help organizations reduce uncertainty, strengthen engagement, and improve workforce stability during digital transformation processes, particularly within rapidly evolving organizational environments such as those associated with Saudi Vision 2030 initiatives.

7. Limitations and Future Research

Several limitations should be considered when interpreting the findings of this study. First, the research relied on a cross-sectional design, which restricts the ability to establish temporal relationships among the study variables. While the results identify significant associations between digital transformation, employee engagement, and turnover intention, they do not provide insight into how these relationships may change over time. As digital transformation is a continuous and evolving organizational phenomenon, future studies are encouraged to employ longitudinal research designs to better understand its sustained influence on employee engagement and turnover intention across different stages of organizational change. Second, the study was conducted within the context of Saudi Arabia, which may limit the generalizability of the findings to other cultural and organizational settings. Future studies should replicate this research in different countries and industries to explore potential contextual variations in the effects of digital transformation. Third, the study focused primarily on employee engagement and turnover intention, while other relevant variables—such as organizational culture, leadership style, organizational support, digital literacy, technological stress, and employee autonomy—were not included

in the model. These factors may play important moderating or mediating roles in shaping employee responses to digital transformation. Additionally, the reliance on self-reported data may introduce potential biases, including social desirability and recall bias. Although measures were taken to ensure anonymity and reduce response bias, future research could enhance validity by incorporating objective data sources, such as organizational records, performance metrics, or system usage data. Furthermore, individual differences among employees—such as technological competence, resilience, and adaptability—were not examined in this study. Future research should explore the role of such individual-level characteristics to better understand variability in employee outcomes and to inform more targeted organizational interventions. An additional limitation relates to the participant recruitment process and the potential for selection bias associated with online survey distribution. The use of digital recruitment channels may have disproportionately attracted employees who are more digitally active, professionally networked, technologically comfortable, and responsive to online participation requests. As a result, the obtained sample may overrepresent individuals with more favorable perceptions of digital transformation and higher levels of employee engagement. Consequently, the findings should not be generalized broadly to all Saudi organizations or workforce segments. Another limitation of the study is that demographic control variables such as age, gender, tenure, and organizational sector were not incorporated into the SEM analysis. Although the study focused primarily on the relationships among digital transformation, employee engagement, and turnover intention, these demographic factors may influence employees' perceptions and workplace attitudes. Future research may incorporate demographic controls and conduct subgroup or multi-group analyses to examine potential differences across employee categories and organizational contexts.

8. Conclusions

This study examined the relationship between digital transformation, employee engagement, and turnover intention, highlighting the mediating role of employee engagement. The findings demonstrate that digital transformation influences employees' workplace experiences and may either strengthen engagement or increase turnover intention depending on how the transformation process is managed. The study emphasizes that successful digital transformation requires more than technological investment; it also depends on organizational support, leadership, communication, and employee training. Organizations that actively support employees during digital change are more likely to enhance engagement and reduce turnover intention. Importantly, this study contributes to the limited literature on digital transformation within the Saudi Arabian and GCC context. In light of Saudi Vision 2030 and the rapid pace of digitalization, the findings highlight the importance of adopting employee-centered digital transformation strategies that balance technological advancement with employee well-being and organizational readiness for change.

Author Contributions: Methodology, S.D.; Validation, S.D.; Investigation, N.A.-H. and N.A.-A. Data curation, S.D., N.A.-H. and N.A.-A. Writing—original draft, N.A.-H. and N.A.-A. Writing—review and editing, S.D.; Supervision, S.D. All authors have read and agreed to the published version of the manuscript.

Funding: This research is supported by research supporting program [ORF-2026-1023].

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board [or Ethics Committee] of King Saud University No.: KSU-HE-25-123.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets generated and analysed during the current study are not publicly available due to participants' privacy but are available from the corresponding author on reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

DT	Digital transformation
DTC	Digital Transformation Competency
EE	Employee Engagement
DL	Digital Literacy
TI	Turnover Intention
AI	Artificial Intelligence
ETI	Employee Turnover Intention
JDR	Job Demands–Resources
TAM	Technology Acceptance Model
SET	Social Exchange Theory
TAT	Trait Activation Theory
SEM	Structural Equation Modeling
AMOS	Analysis of Moment Structures (Software)
SPSS	Statistical Package for the Social Sciences
CFA	Confirmatory Factor Analysis
AVE	Average Variance Extracted
REL	Reliability
SEM (in statistics)	Standard Error of Measurement
CFI	Comparative Fit Index
TLI	Tucker–Lewis Index
RMR	Root Mean Square Residual
RMSEA	Root Mean Square Error of Approximation
GFI	Goodness of Fit Index
AGFI	Adjusted Goodness of Fit Index
PCLOSE	<i>p</i> -Value for Close Fit

Appendix A. Scale Item # 1 (English)

All items below, except for those in the demographic section, are measured using a 5-point Likert scale ranging from 1 (Strongly Agree) to 5 (Strongly Disagree).

Questionnaire

General Demographic Information:

Please respond to the following:

1. Gender:
 - Male
 - Female
2. Education Level:
 - High School
 - Diploma
 - Bachelor's Degree
 - Master's Degree
 - Doctorate
3. Years of Work in the Organization:
 - 3 to 5 years
 - 5 to 7 years

- 7 to 10 years
4. Age:
 - 20 to 25 years
 - 25 to 30 years
 - 30 to 35 years
 - Over 35 years
 5. Employment Sector:
 - Private
 - Government

SECTION 1: Digital Transformation in Your Organization

Instructions: Please indicate how much you agree or disagree with the following statements.

1. Our organization effectively uses digital tools such as Zoom, Microsoft Teams and other apps to improve work efficiency.
2. We use advanced digital technologies like artificial intelligence (AI) and cloud computing in our daily operations.
3. Employees receive training on how to use digital tools and technologies for their jobs.
4. Digital technologies have made our business processes faster and more efficient.
5. We are always looking for new ways to improve our work using digital solutions.
6. We use online platforms (like websites, social media, or apps) to communicate and interact with customers.
7. Our company actively collects customer feedback through digital channels (such as surveys or online reviews).
8. Innovation and adaptability to new technology are encouraged within our organization.
9. Employees are supported when they try new digital solutions or experiment with technology.
10. Our company has a clear and well-defined plan for digital transformation with strategies to ensure its success, contributing to the overall growth and success of the company.

SECTION 2: Employee Engagement at Work

Instructions: Please indicate how much you agree or disagree with the following statements.

11. I feel full of energy and motivated when I start my workday.
12. I enjoy and feel excited about my job.
13. My job is meaningful and gives me a sense of purpose.
14. I feel proud to be a part of this organization.
15. I am dedicated to helping my organization achieve its goals.
16. I get deeply involved in my work and focus fully on my tasks.
17. I often lose track of time while working because I am so engaged.
18. I experience a “flow state” where work feels smooth and effortless.

SECTION 3: Thoughts on Leaving the Job (Turnover Intentions)

Instructions: Please indicate how much you agree or disagree with the following statements.

19. I often think about quitting my current job.
20. I plan to look for a new job within the next year.
21. I am actively searching for job opportunities outside my current organization.
22. If I found a better job opportunity, I would leave my current company.
23. I do not see myself working at this company for the long term.

References

- Vial, G. Understanding digital transformation: A review and a research agenda. *J. Strateg. Inf. Syst.* **2019**, *28*, 118–144. [\[CrossRef\]](#)
- Kane, G.C.; Palmer, D.; Phillips, A.N.; Kiron, D.; Buckley, N. *Strategy, Not Technology, Drives Digital Transformation*; MIT Sloan Management Review and Deloitte University Press: Cambridge, MA, USA, 2015.
- Muduli, A.; Choudhury, A. Exploring the role of workforce agility on digital transformation: A systematic literature review. *Benchmarking Int. J.* **2025**, *32*, 492–512. [\[CrossRef\]](#)
- Ye, D.; Xu, B.; Wei, B.; Zheng, L.; Wu, Y.J. Employee work engagement in the digital transformation of enterprises: A fuzzy-set qualitative comparative analysis. *Humanit. Soc. Sci. Commun.* **2024**, *11*, 35. [\[CrossRef\]](#)
- Bharadwaj, A.; El Sawy, O.A.; Pavlou, P.A.; Venkatraman, N. Digital business strategy: Toward a next-generation conceptualization. *MIS Q.* **2013**, *37*, 471–482. [\[CrossRef\]](#)
- Brynjolfsson, E.; McAfee, A. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*; W.W. Norton & Company: New York, NY, USA, 2014.
- Kraus, S.; Jones, P.; Kailer, N.; Weinmann, A.; Chaparro-Banegas, N.; Roig-Tierno, N. Digital transformation: An overview of the current state of the art of research. *SAGE Open* **2021**, *11*, 21582440211047576. [\[CrossRef\]](#)
- Saks, A.M. Antecedents and consequences of employee engagement. *J. Manag. Psychol.* **2006**, *21*, 600–619. [\[CrossRef\]](#)
- Schaufeli, W.B.; Bakker, A.B.; Salanova, M. The measurement of work engagement with a short questionnaire: A cross-national study. *Educ. Psychol. Meas.* **2006**, *66*, 701–716. [\[CrossRef\]](#)
- Avolio, B.J.; Walumbwa, F.O.; Weber, T.J. Leadership: Current theories, research, and future directions. *Annu. Rev. Psychol.* **2009**, *60*, 421–449. [\[CrossRef\]](#) [\[PubMed\]](#)
- Naqshbandi, M.M.; Kabir, I.; Ishak, N.A.; Islam, M.Z. The future of work: Work engagement and job performance in the hybrid workplace. *Learn. Organ.* **2024**, *31*, 5–26. [\[CrossRef\]](#)
- Macey, W.H.; Schneider, B. The meaning of employee engagement. *Ind. Organ. Psychol.* **2008**, *1*, 3–30. [\[CrossRef\]](#)
- Venkatesh, V.; Morris, M.G.; Davis, G.B.; Davis, F.D. User acceptance of information technology: Toward a unified view. *MIS Q.* **2003**, *27*, 425–478. [\[CrossRef\]](#)
- Ayyagari, R.; Grover, V.; Purvis, R. Technostress: Technological antecedents and implications. *MIS Q.* **2011**, *35*, 831–858. [\[CrossRef\]](#)
- Tarafdar, M.; Pullins, E.B.; Ragu-Nathan, T.S. Technostress: Negative effect on performance and the role of work skills. *J. Bus. Res.* **2019**, *102*, 288–297. [\[CrossRef\]](#)
- Ragu-Nathan, T.S.; Tarafdar, M.; Ragu-Nathan, B.S.; Tu, Q. The consequences of technostress for end users in organizations. *Inf. Syst. Res.* **2008**, *19*, 417–433. [\[CrossRef\]](#)
- Tarafdar, M.; Tu, Q.; Ragu-Nathan, B.S.; Ragu-Nathan, T.S. The impact of technostress on role stress and productivity. *J. Manag. Inf. Syst.* **2007**, *24*, 301–328. [\[CrossRef\]](#)
- Day, A.; Scott, N.; Kelloway, E.K. Information and communication technology: Implications for job stress and employee well-being. In *New Developments in Theoretical and Conceptual Approaches to Job Stress: Research in Occupational Stress and Well-Being*; Perrewé, P.L., Ganster, D.C., Eds.; Emerald Group Publishing Limited: Bingley, UK, 2010; Volume 8, pp. 317–350. [\[CrossRef\]](#)
- Molino, M.; Cortese, C.G.; Ghislieri, C. The role of technostress in the workplace: A comprehensive review. *Front. Psychol.* **2020**, *11*, 580897. [\[CrossRef\]](#) [\[PubMed\]](#)
- Nguyen, T.; Phillip, M.; Suess, S. Local government employees' technology acceptance of e-participation: An empirical analysis using structural equation modeling. *Adm. Soc.* **2023**, *55*, 1839–1865. [\[CrossRef\]](#)
- Hizam, S.M.; Akter, H.; Sentosa, I.; Ahmed, W.; Masrek, M.N.; Ali, J. Predicting workforce engagement towards digital transformation through a multi-analytical approach. *Sustainability* **2023**, *15*, 6835. [\[CrossRef\]](#)
- Westerman, G.; Calm ejane, C.; Ferraris, P.; Bonnet, D. *Digital Transformation: A Roadmap for Billion-Dollar Organizations*; MIT Center for Digital Business: Cambridge, MA, USA, 2014.
- Westerman, G.; Bonnet, D.; McAfee, A. *Leading Digital: Turning Technology into Business Transformation*; Harvard Business Review Press: Boston, MA, USA, 2014.
- AlNuaimi, B.K.; Singh, S.K.; Ren, S.; Budhwar, P.; Vorobyev, D. Mastering digital transformation: The nexus between leadership, agility, and organizational performance in emerging markets. *J. Bus. Res.* **2022**, *145*, 636–648. [\[CrossRef\]](#)
- Alsharif, A.H.; Salleh, N.Z.M.; Baharun, R.; Al-Harbi, A. Digital transformation in Saudi Arabia: Opportunities and challenges for organizations. *Sustainability* **2021**, *13*, 9874. [\[CrossRef\]](#)
- Blau, P.M. *Exchange and Power in Social Life*; Wiley: New York, NY, USA, 1964.
- Davis, F.D. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* **1989**, *13*, 319–340. [\[CrossRef\]](#) [\[PubMed\]](#)
- Venkatesh, V.; Thong, J.Y.L.; Xu, X. Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Q.* **2012**, *36*, 157–178. [\[CrossRef\]](#)
- Schwarz m uller, T.; Brosi, P.; Duman, D.; Welp, I.M. How Does the Digital Transformation Affect Organizations? Key Themes of Change in Work Design and Leadership. *Manag. Rev. Q.* **2018**, *29*, 114–138. [\[CrossRef\]](#)

30. Pu, B.; Sang, W.; Ji, S.; Hu, J.; Phau, I. The effect of customer incivility on employees' turnover intention in the hospitality industry: A chain mediating effect of emotional exhaustion and job satisfaction. *Int. J. Hosp. Manag.* **2024**, *118*, 103665. [\[CrossRef\]](#)
31. Mobley, W.H.; Griffeth, R.W.; Hand, H.H.; Meglino, B.M. Review and conceptual analysis of the employee turnover process. *Psychol. Bull.* **1979**, *86*, 493–522. [\[CrossRef\]](#)
32. Mitchell, T.R.; Holtom, B.C.; Lee, T.W.; Sablinski, C.J.; Erez, M. Why people stay: Using job embeddedness to predict voluntary turnover. *Acad. Manag. J.* **2001**, *44*, 1102–1121. [\[CrossRef\]](#)
33. Hom, P.W.; Mitchell, T.R.; Lee, T.W.; Griffeth, R.W. Reviewing employee turnover: Focusing on proximal withdrawal states and an expanded criterion. *Psychol. Bull.* **2012**, *138*, 831–858. [\[CrossRef\]](#) [\[PubMed\]](#)
34. Allen, D.G.; Shore, L.M.; Griffeth, R.W. The role of perceived organizational support and supportive human resource practices in the turnover process. *J. Manag.* **2003**, *29*, 99–118. [\[CrossRef\]](#)
35. Helsper, E.J.; Eynon, R. Digital natives: Where is the evidence? *Br. Educ. Res. J.* **2010**, *36*, 503–520. [\[CrossRef\]](#)
36. Bakker, A.B.; Demerouti, E. The job demands–resources model: State of the art. *J. Manag. Psychol.* **2007**, *22*, 309–328. [\[CrossRef\]](#)
37. Brislin, R.W. Back-translation for cross-cultural research. *J. Cross-Cult. Psychol.* **1970**, *1*, 185–216. [\[CrossRef\]](#)
38. Etikan, I.; Musa, S.A.; Alkassim, R.S. Comparison of convenience sampling and purposive sampling. *Am. J. Theor. Appl. Stat.* **2016**, *5*, 1–4. [\[CrossRef\]](#)
39. Fitzgerald, M.; Kruschwitz, N.; Bonnet, D.; Welch, M. Embracing digital technology: A new strategic imperative. *MIT Sloan Manag. Rev.* **2014**, *55*, 1. Available online: <https://emergenceweb.com/blog/wp-content/uploads/2013/10/embracing-digital-technology.pdf> (accessed on 24 April 2026). [\[CrossRef\]](#)
40. Schaufeli, W.B.; Bakker, A.B. *Utrecht Work Engagement Scale: Preliminary Manual*; Utrecht University: Utrecht, The Netherlands, 2003.
41. Steel, R.P.; Ovalle, N.K. A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. *J. Appl. Psychol.* **1984**, *69*, 673–686. [\[CrossRef\]](#)
42. Harman, H.H. *Modern Factor Analysis*, 3rd ed.; University of Chicago Press: Chicago, IL, USA, 1976.
43. Podsakoff, P.M.; MacKenzie, S.B.; Lee, J.Y.; Podsakoff, N.P. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* **2003**, *88*, 879–903. [\[CrossRef\]](#) [\[PubMed\]](#)
44. Tarafdar, M.; Cooper, C.L.; Stich, J.F. The technostress trifecta. *Inf. Syst. J.* **2019**, *29*, 6–42. [\[CrossRef\]](#)
45. Molino, M.; Cortese, C.G.; Ghislieri, C. The promotion of technology acceptance and work engagement in Industry 4.0. *Int. J. Environ. Res. Public Health* **2020**, *17*, 2438. [\[CrossRef\]](#) [\[PubMed\]](#)
46. Albrecht, S.L.; Bakker, A.B.; Gruman, J.A.; Macey, W.H.; Saks, A.M. Employee engagement, human resource management practices and competitive advantage. *J. Organ. Eff. People Perform.* **2015**, *2*, 7–35. [\[CrossRef\]](#)
47. Verhoef, P.C.; Broekhuizen, T.; Bart, Y.; Bhattacharya, A.; Dong, J.Q.; Fabian, N.; Haenlein, M. Digital transformation: A multidisciplinary reflection and research agenda. *J. Bus. Res.* **2021**, *122*, 889–901. [\[CrossRef\]](#)
48. Poku, C.A.; Bayuo, J.; Agyare, V.A.; Sarkodie, N.K.; Bam, V. Work engagement, resilience and turnover intentions among nurses: A mediation analysis. *BMC Health Serv. Res.* **2025**, *25*, 71. [\[CrossRef\]](#) [\[PubMed\]](#)

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.