INTERNATIONAL JOURNAL OF eBUSINESS AND eGOVERNMENT STUDIES
Vol: 15 **No:** 1 **Year:** 2023 **ISSN:** 2146-0744 (Online) (**pp.** 234-254) **Doi:** 10.34109/ijebeg.2023150111
Received: 10.01.2022 | **Accepted:** 15.06.2023 | **Published Online:** 27.07.2023

-RESEARCH ARTICLE-

EFFECTS OF TECHNOLOGY AND PROCESS INNOVATION ON EMPLOYEE PERFORMANCE: MEDIATING ROLE OF JOB SATISFACTION, AND MODERATING ROLE OF CHANGE READINESS

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─Abstract─

The purpose of this study is to explore the impact of technology and process innovation on employee performance. This study seeks to investigate the mediating role of job satisfaction and the moderating role of change readiness in the relationship between innovation practices and job satisfaction. The present investigation is a cross-sectional study that was carried out within various organizations in Saudi Arabia. A total of 231 individuals took part in the online survey. The utilization of structural equation modelling is employed in order to examine the postulated associations. The findings suggest that there is no direct impact of technology and process innovation on employee performance. The relationship between them is fully mediated by job satisfaction. The results additionally indicate that change readiness also serves as a moderating factor in this association. This study highlights the significance of incorporating mediating mechanisms into the examination of the impacts of innovation practices on employee performance. This study proposes that organizations should consider the satisfaction levels of their employees prior to implementing any change initiative, as a dissatisfied workforce may not exhibit the desired response in such circumstances.

Citation (APA): Aliane, N., Zakariya, A. (2023). Effects of Technology and Process Innovation on Employee Performance: Mediating Role of Job Satisfaction, and Moderating Role of Change Readiness. *International Journal of eBusiness and eGovernment Studies, 15*(1), 234-254. doi: 10.34109/ijebeg.2023150111

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Keywords: Technology innovation, process innovation, change readiness, employee performance, job satisfaction, Saudi organizations.

INTRODUCTION

In the contemporary dynamic and continuously evolving business environment, the significance of technology and process innovation has emerged as a pivotal determinant of organisational success and the attainment of a competitive edge (Alraja et al., 2022; García-Lopera et al., 2022). These technological advancements enable organizations to streamline their operations, improve efficiency, and provide products and services with remarkable speed and quality. The subject of considerable interest and scholarly investigation revolves around the impact of technology and process innovation on employee performance. The significance of examining the impacts of technology and process innovation on employee performance resides in their capacity to fundamentally transform organisational operations and employee work engagement. The advent of technological advancements, including artificial intelligence, automation, and data analytics, is fundamentally transforming various industries and the nature of job positions, necessitating a workforce that is flexible and capable of adjusting to changing circumstances. In the same manner, the implementation of process innovation, which involves advancements in workflows, procedures, and business practises, has facilitated organisations in enhancing their allocation of resources and improving operational efficiency (Camisón & Villar-López, 2014; Dasgupta & Gupta, 2009). The pivotal role of employees in the implementation of these innovations necessitates a comprehensive understanding of their impact on employee performance, which is crucial for the overall success of the organization.

Previously research investigations have extensively examined the direct influence of technology and process innovation on the performance of employees. However, there exists a significant gap in the existing body of research pertaining to the mediating and moderating mechanisms that are involved in this relationship. The positive impact of innovation on employee skills, autonomy, and motivation has been emphasized in research conducted by Dasgupta and Gupta (2009) as well as Camisón and Villar-López (2014). Moreover, previous studies conducted by Falkenburg and Schyns (2007), as well as Auer Antoncic and Antoncic (2011), have established a connection between technological innovation and job satisfaction. These findings suggest that employees who experience satisfaction in their work tend to exhibit enhanced levels of commitment, creativity, and overall performance. Nevertheless, the primary emphasis of these studies has been on the direct associations. The literature discusses job satisfaction as a potential mediator in the relationship between technological innovation and employee performance, as it is considered to be a factor that contributes to positive workplace behaviors (Auer Antoncic & Antoncic, 2011; Falkenburg & Schyns, 2007). When employees experience job satisfaction, they are more inclined to exhibit higher

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levels of motivation, engagement, and commitment towards achieving the objectives of the organization. Job satisfaction serves as a psychological mechanism that potentially links the positive effects of innovation to the performance of employees. Nevertheless, there exists a dearth of empirical data that investigates the mediating function of job satisfaction within the realm of technological and process innovations.

Moreover, it is important to note that change readiness plays a significant role in shaping employees' reactions towards technological and process innovations (Choi & Ruona, 2011). Change readiness encompasses an individual's cognitive, emotional, and intentional orientations towards change. While the importance of change readiness in facilitating successful organizational change has been acknowledged, there is a dearth of research investigating its potential moderating effect on the relationship between innovation and employee performance.

The primary objective of this study is to fill the current gap in research by investigating the impact of technological and process innovation on employee performance. This will be achieved by considering the mediating influence of job satisfaction and the moderating influence of change readiness. By leveraging existing scholarly works, this research endeavor seeks to provide a thorough and intricate comprehension of the mechanisms that underlie the correlation between innovation and employee performance.

In a nutshell the primary objective of this study is to make a valuable contribution to the expanding corpus of scholarly works pertaining to innovation, job satisfaction, and employee performance. Through an examination of the mediating and moderating mechanisms involved, the objective of this study is to offer practical insights for organizations aiming to attain sustainable success within a swiftly changing business environment. A comprehensive analysis of the mediating and moderating roles of job satisfaction and change readiness is anticipated to yield valuable insights that can inform decision-making, increase employee engagement, and cultivate a culture of innovation within organizations. This study aims to explore the intricate relationship between technology, process innovation, and employee performance, with a focus on highlighting their dynamic interplay. By doing so, this research seeks to provide valuable insights for organisations seeking to effectively navigate and prosper in an ever more competitive and rapidly changing global economy.

LITERATURE REVIEW

Technological Innovation and Employee Performance

The impact of technological innovation on employee performance within organizations is of significant importance (Camisón & Villar-López, 2014; Dasgupta, Gupta, & Sahay, 2011). Technological innovation facilitates organizational learning, idea exploration, and process improvement through the implementation of novel technologies, integration of

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existing technologies, and utilization of emerging knowledge (Dasgupta, Gupta, & Sahay, 2011; Sabadie, 2014; Tai Tsou, 2012). Consequently, organizations can attain a competitive edge (Donbesuur, Zahoor, & Adomako, 2021). Employees show a strong sense of self-assurance in their ability to generate novel ideas, embrace risk-taking, and question established norms in their work practises. This, in turn, fosters heightened levels of internal motivation and a profound sense of fulfilment (Lin, Huang, & Zhang, 2019).

Furthermore, it has been argued that technological advancements foster a conducive learning atmosphere within organizational settings, facilitating enhanced communication and collaboration among personnel (Schaufeli, Bakker, & Van Rhenen, 2009). According to Li et al. (2020), the implementation of a cooperative environment enables employees to engage in the exchange of ideas, gain exposure to diverse perspectives, and enhance their knowledge. The above-mentioned setting cultivates creativity, facilitates problem-solving, and promotes innovation, thereby augmenting the psychological well-being and performance of employees.

However, the impact of technological innovation on employee emotional well-being exhibits a threshold effect. As technological innovation advances, it necessitates increased levels of coordination, communication, and creative endeavors from employees, potentially resulting in elevated levels of stress and diminished overall well-being (Balland et al., 2019; Crawford, LePine, & Rich, 2010). High levels of technological innovation can exert a strain on employees, compelling them to consistently generate novel ideas and exhibit creativity, which may impede their overall well-being (Schaufeli, Bakker, & Van Rhenen, 2009). Additionally, the need to incorporate and amalgamate the diverse knowledge of various colleagues in order to identify the most optimal ideas can engender a sense of competition and hinder the unrestricted exchange of ideas (Johnson et al., 2020). In order to optimize employee performance and enhance their overall well-being, it is imperative for organizations to achieve a harmonious equilibrium in their technological innovation endeavors. This entails offering employees ample opportunities for learning, fostering creativity, and promoting collaboration, while simultaneously mitigating the potential adverse consequences associated with excessive technological demands.

In conclusion, it is reasonable to propose that technological innovation could serve as a significant factor influencing employee performance. The provision of meaningful work opportunities has the potential to facilitate employee engagement, enhance motivation levels, cultivate a collaborative learning atmosphere, and ultimately result in improved performance outcomes. Based on the aforementioned literature, we put forth the following hypotheses.:

H1: Technological innovation enhances employee performance.

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Process innovation and Performance

A number of studies have pointed out the substantial influence of process innovations on employee performance, thereby corroborating the proposition that process innovation plays a pivotal role in fostering employee productivity (Choi, Jang, & Hyun, 2009; Dasgupta & Gupta, 2009; Gunday et al., 2011). Process innovation refers to the adoption of novel or significantly enhanced production or delivery methods. Numerous studies consistently demonstrate a positive correlation between process innovation and employee performance. Umashankar, Srinivasan, and Hindman (2011) conducted a study in which they observed improvements in job performance and delivery systems among customer service agents following modifications to existing processes. The aforementioned findings provide evidence of the positive impact that process innovation can have on improving employee effectiveness and efficiency within their respective roles.

Similarly, research has shown that the implementation of novel management systems, practices, techniques, and processes can enhance the efficacy and efficiency of organizational operations (Walker, 2007). Process innovation is a strategic approach that seeks to reduce operational costs, enhance the quality of products or services, decrease service delivery time, and improve operational flexibility by prioritising the development of new or substantially improved methods of production or service delivery (Walker, 2007). The confluence of these factors collectively contributes to the enhancement of worker performance.

The banking sector has experienced significant transformation as a result of process innovation, which is complemented by product innovations as a crucial business strategy (Damanpour, 2010). The integration of process and product innovations is crucial for ensuring the enduring success and sustainability of businesses (Kandampully, 2002). The statement above highlights the significance of process innovation in influencing the performance of employees and the overall outcomes of an organization.

Research indicates that process innovation has a more significant effect on employee productivity than product innovation, although both types of innovation yield positive outcomes in this area (Hall, Lotti, & Mairesse, 2009). The statement mentioned earlier underscores the significance of prioritizing process enhancement as a strategy to augment employee performance and overall productivity.

In conclusion, the current literature provides evidence that process innovation has a substantial impact on employee performance. Organizations have the potential to enhance employee effectiveness, efficiency, and productivity by implementing new or improved production and delivery methods. Furthermore, the incorporation of both

process and product innovations is imperative for the enduring prosperity and viability of enterprises. Hence, we propose that:

H2: Process innovation improves employee performance.

Mediating role of job satisfaction between technological innovation and employee performance

As previously mentioned, the role of technological innovation in enhancing employee performance has been recognised by scholars (Camisón & Villar-López, 2014; Dasgupta & Gupta, 2009). The introduction of novel technologies and subsequent technological innovation has been found to significantly augment the skills, autonomy, and sense of purpose among employees. However, it is imperative to take into account the mediating effect of job satisfaction on the relationship between technological innovation and employee performance. Extensive research has consistently demonstrated that there exists a strong correlation between job satisfaction and employee motivation and commitment (Auer Antoncic & Antoncic, 2011; Falkenburg & Schyns, 2007). A connection between technological innovation and employee performance may be mediated by job satisfaction. When employees experience job satisfaction, there is a higher likelihood of them being engaged, motivated, and exhibiting enhanced performance. Hence, it can be posited that job satisfaction plays a mediating role in augmenting the association between technological innovation and employee performance.

Technological innovation has a significant impact on job satisfaction through multiple mechanisms. Initially, it provides employees with opportunities to participate in meaningful tasks, explore innovative concepts, and make valuable contributions to the advancement and prosperity of the organization (Lindholm-Dahlstrand, Andersson, & Carlsson, 2019; Liu, Wang, & Zhu, 2020). The earlier mentioned perception regarding purpose and achievement has been found to have a positive impact on job satisfaction and serves as a motivating factor for enhancing employee performance. Furthermore, the implementation of technological advancements fosters a culture of knowledge acquisition within organizational settings, thereby facilitating enhanced communication, collaboration, and the dissemination of ideas (Schaufeli, Bakker, & Van Rhenen, 2009). In this collaborative environment, employees are afforded the opportunity to consistently enhance their skills and knowledge, resulting in heightened job satisfaction and enhanced performance. Furthermore, it has been observed that technological advancements contribute to the improvement of job characteristics, including autonomy, control, and variety, which have been identified as factors closely linked to job satisfaction (Rhoads et al., 2002). Technological advancements provide employees enhanced control over their work processes, a wider range of tasks, and increased avenues for feedback, all of which collectively contribute

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to elevated levels of job satisfaction and, consequently, enhanced performance. Thus, we propose the following hypothesis:

H3: Job satisfaction mediates the relationship between technological innovation and employee performance.

Mediating role of job satisfaction between process innovation and employee performance

The current collection of literature has firmly established the positive impact of process innovation on organizational performance (Falkenburg & Schyns, 2007). Nevertheless, it is crucial to acknowledge the significance of job satisfaction as a mediator in the relationship between process innovation and employee performance. The relationship between process innovation and employee performance is mediated by job satisfaction, as it serves to enhance employee motivation and commitment. Process innovation contributes to the establishment of a dynamic work environment through the optimization of processes, enhancement of efficiency, and simplification of tasks (Falkenburg & Schyns, 2007). As a result, the perception of these enhancements in work processes by employees leads to an elevation in their job satisfaction, thereby yielding heightened levels of motivation and performance.

Similar to technological innovation, process innovation also plays a role in enhancing job satisfaction by influencing job characteristics. The implementation of work process redesign within organizations has the potential to enhance employee autonomy, skill variety, and feedback, thereby resulting in heightened levels of job satisfaction (Rhoads et al., 2002). The enhanced job characteristics contribute to the development of a sense of achievement and engagement among employees, thereby augmenting their overall performance.

In a similar manner process innovation frequently requires collaboration and collective effort, enabling employees to collaborate on initiatives aimed at enhancing processes (Schaufeli, Bakker, & Van Rhenen, 2009). The presence of a collaborative environment fosters positive interpersonal connections, efficient exchange of information, and a feeling of inclusion, all of which collectively enhance job satisfaction and elevate overall performance levels.

In brief, it is plausible that job satisfaction serves as an intermediary factor in the relationship between process innovation and employee performance, as it facilitates a favorable work atmosphere, enhances job attributes, and encourages cooperation. Acknowledging the significance of job satisfaction as an intermediary variable between process innovation and performance can assist organizations in effectively leveraging these innovations to enhance employee achievement and overall organizational effectiveness. Based on this premise, we propose the following hypothesis:

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H4: Job satisfaction mediates between process innovation and employee performance.

Change readiness as moderator

Change readiness, encompassing an individual's cognitive, emotional, and intentional dispositions towards change, holds considerable importance in facilitating organizational adaptation and improving performance (Choi & Ruona, 2011; de Jong, Nikolova, & Caniëls, 2023; Luo et al., 2022). Cognitive readiness refers to an individual's cognitive beliefs and perceptions regarding change, while emotional readiness pertains to their emotional attitudes and feelings towards change. Intentional readiness, on the other hand, encompasses their behavioral intention to actively engage in the process of change. The significance of change readiness in moderating the association between psychological capital and adaptive performance is underscored in a study conducted by Choi and Ruona (2011). Employees who possess a higher level of readiness for change are more adept at adjusting to new circumstances and demonstrating effective performance in dynamic environments.

In addition, the level of preparedness for change has a significant impact on the manner in which employees react to both process innovation and technological innovation. Employees who possess higher levels of change readiness are more inclined to view these innovations as favorable prospects for personal and professional advancement (Bouckenooghe, Devos, & Van den Broeck, 2009; Luo et al., 2021). Individuals' cognitive readiness allows them to readily adopt novel ideas, methodologies, and strategies related to innovation. Moreover, their psychological preparedness enables them to encounter favorable affective states, such as enthusiasm and inquisitiveness, in reaction to modifications instigated by technological advancements.

Moreover, it can be observed that employees who possess a higher level of change readiness tend to demonstrate intentional readiness, leading to a heightened inclination to actively engage in the process of change (Bouckenooghe, Devos, & Van den Broeck, 2009; Choi & Ruona, 2011; Rafferty & Minbashian, 2019). They adapt their knowledge and abilities, engage in ongoing learning, and support the effective application of technological and process innovation.

On the other hand, personnel who are less receptive to change may view process and technological innovation as threatening and disruptive (Bouckenooghe, Devos, & Van den Broeck, 2009). Their low emotional preparedness could result in unpleasant emotions like anxiety or irritation, while their low cognitive readiness could result in resistance, scepticism, or a fear of change. Their commitment to the transition process is hampered by this lack of preparation, which lowers job satisfaction and could have a detrimental impact on performance.

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In a nutshell, it is evident that change readiness can serve as a significant moderating factor in the relationship between process innovation, technological innovation, and job satisfaction. Employees who possess higher levels of change readiness are more inclined to perceive and accept innovation as favorable opportunities, resulting in increased levels of job satisfaction. Conversely, individuals who possess a lower level of readiness for change within the workplace may encounter resistance and experience negative emotions, ultimately resulting in diminished levels of job satisfaction.

The comprehension and cultivation of change readiness within employees are crucial for the effective execution of process innovation, technological innovation, and ultimately, the augmentation of job satisfaction and performance. We hereby present the following hypotheses:

H5: Change readiness moderates the relationship between technological innovation and job satisfaction of employees.

H6: Change readiness moderates the relationship between process innovation and job satisfaction of employees.

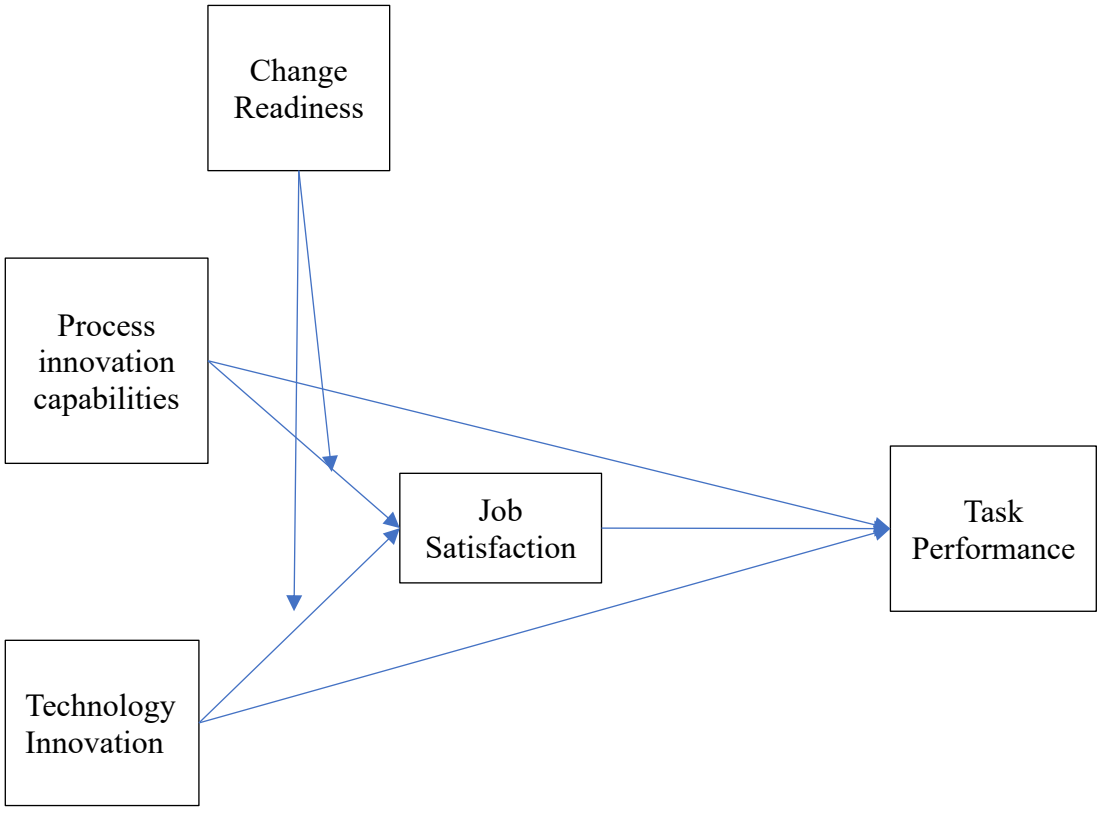

Figure 1 - Research Framework

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METHODS

Sampling and Data collection

Data was collected from small and medium-sized enterprises (SMEs) that are currently operating within the Kingdom of Saudi Arabia. The researchers employed convenience sampling as a method to select participants who were employed within small and medium-sized enterprises (SMEs). The participants in this study were recruited through the human resources department or personal connections within small and medium-sized enterprises (SMEs). The data was obtained through the utilization of a self-administered survey. A total of 231 responses were obtained via online surveys.

Research Instrument

The variables in this study were assessed using established measures that have been validated and documented in existing scholarly literature. The measurement of technology innovation was conducted using a scale developed by Camisón and Villar-López (2014). The measurement of change readiness was conducted using a scale developed by Holt et al. (2007). The measurement of job satisfaction was conducted using a scale that was developed by Judge et al. (2005). The measurement of task performance was conducted using an instrument developed by Griffin, Neal, and Parker (2007), while the assessment of the organization's process innovation capabilities was carried out using a scale developed by Camisón and Villar-López (2014). The survey instruments' details are presented in Table 1.

Table 1. Instrument

Technological innovation (7 point Likert scale) 1.The organization continues to develop a range of products. 2. The organization can replace products that become obsolete. 3. The organization continues to adopt the latest technology in products or processes. 4. The organization integrates management activities to reduce the cost of production	(Camisón & Villar-López, 2014)
Change Readiness 1. The program or area in which I work functions well and does not have any aspects that need changing (R*) 2. There is nothing I need to change about the way I do my job to be more efficient (R*) 3. I will resist any changes to the program or area in which I work (R*) 4. I look forward to be involved in changing the program or area in which I work	

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Technological innovation (7 point Likert scale) 1.The organization continues to develop a range of products. 2. The organization can replace products that become obsolete. 3. The organization continues to adopt the latest technology in products or processes. 4. The organization integrates management activities to reduce the cost of production	(Camisón & Villar-López, 2014)
Job Satisfaction (5 point Likert scale) 1. Most days I am enthusiastic about my work. 2. I feel fairly satisfied with my present job. 3. I find real enjoyment in my work.	(Judge et al., 2005)
Task Performance 1. I Carry out the core parts of my job well 2.I Complete my core tasks well using the standard procedures 3. I ensure my tasks are completed properly.	(Griffin, Neal, & Parker, 2007)
Process Innovation capabilities 1. My firm is able to create and manage a portfolio of interrelated technologies. 2. My firm is able to master and absorb the basic and key technologies of business. 3. My firm continually develops programs to reduce production costs. 4. My firm has valuable knowledge for innovating manufacturing and technological processes. 5. My firm has valuable knowledge on the best processes and systems for work organization. 6. My firm organizes its production efficiently. 7. My firm assigns resources to the production department efficiently. 8. My firm is able to maintain a low level of stock without impairing service. 9. My firm is able to offer environmentally friendly processes 10. My firm manages production organization efficiently 11. My firm is able to integrate production management activities	(Camisón & Villar-López, 2014)

ANALYSIS

The analysis of the survey data involved the utilisation of structural equation modelling (SEM) with the assistance of Amos software. Structural Equation Modelling (SEM) is a robust statistical technique that facilitates the evaluation of intricate relationships among multiple variables. Structural equation modelling (SEM) was utilised in the present study to assess the associations between the pertinent variables and to examine the proposed hypotheses.

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RESULTS

Validity and Reliability

The findings related to the reliability and convergent validity of the variables employed in the study are displayed in Table 2. The values of Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) are provided for each variable. The Cronbach's alpha coefficients for all variables surpass the recommended threshold of 0.7, signifying favourable levels of internal consistency reliability. All variables in the study exhibit CR values that surpass the recommended threshold of 0.6, thereby suggesting a favourable level of composite reliability. The average variance extracted (AVE) values for all variables exceed the recommended threshold of 0.5, suggesting strong convergent validity. To summarise, the findings depicted in Table 2 demonstrate that the measures employed in the research exhibit favourable levels of reliability and convergent validity.

The findings with regard to the discriminant validity of the variables employed in the study are displayed in Table 3. The provided table displays the correlations among the variables, wherein the diagonal elements represent the square root of the Average Variance Extracted (AVE) for each respective variable. In order to evaluate the discriminant validity, it is necessary for the square root of the average variance extracted (AVE) for each variable to exceed the correlations between said variable and all other variables. In this particular instance, it is evident that the square root of the average variance extracted (AVE) values is not presented in the table. Consequently, the evaluation of discriminant validity cannot be conducted using the available information. To summarize, Table 3 displays the correlations among the variables utilized in the study. However, it lacks the necessary information to adequately evaluate the discriminant validity.

Measurement Model Assessment

The measurement model fit indices of the study are presented in Table 4. The presented table displays the comprehensive model score for each fit index, accompanied by the established criteria for acceptable model fit as well as the acceptable baseline values. The findings suggest that the model's overall scores for all fit indices fall within the acceptable range, suggesting a satisfactory level of model fit. The obtained Comparative Fit Index (CFI) score of 0.95 surpasses the minimum threshold of ≥0.90, indicating a satisfactory level of fit. The AGFI score, which measures the adjusted goodness of fit, exceeds the minimum acceptable threshold of ≥0.80, with a value of 0.84. The Root Mean Square Error of Approximation (RMSEA) score is 0.014, which falls below the established threshold of <0.10, indicating an acceptable level of approximation. The CMIN/df score of 2.41 falls below the acceptable threshold of <3. The Tucker-Lewis

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Index (TLI) score of 0.92 surpasses the minimum acceptable threshold of ≥0.89. The score of the Incremental Fit Index (IFI) is 0.94, surpassing the established threshold of ≥0.90 that is considered acceptable. In conclusion, the findings presented in Table 4 demonstrate that the measurement model employed in the study exhibits a favorable level of congruence with the collected data.

Structural Model Assessment

The study's structural model fit indices are presented in Table 5. The presented table displays the comprehensive model scores for each fit index, accompanied by the established criteria for acceptable model fit as well as the acceptable baseline values.

The findings suggest that the model scores for all fit indices fall within the acceptable range, indicating a satisfactory level of model fit. The obtained Comparative Fit Index (CFI) score of 0.92 exceeds the established threshold of ≥0.90, indicating an acceptable level of fit. The AGFI score, which measures the adjusted goodness of fit, is found to be 0.88, surpassing the minimum acceptable threshold of ≥0.80. The Root Mean Square Error of Approximation (RMSEA) score is 0.024, indicating that it falls below the acceptable threshold of <0.10. The CMIN/df score of 1.67 falls below the established threshold of <3, indicating that it is below the acceptable baseline. The Tucker-Lewis Index (TLI) score of 0.94 surpasses the minimum acceptable threshold of ≥0.89. The score of the Incremental Fit Index (IFI) is 0.93, surpassing the established threshold of ≥0.90 that is considered acceptable.

To summarise, the findings presented in Table 5 demonstrate that the structural model employed in the study exhibits a strong alignment with the collected data.

Hypotheses Testing

As demonstrated by the rejection of hypotheses H1 and H2, the findings indicate that technical innovation and process innovation do not have a direct influence on employee performance. As evidenced by the acceptance of hypotheses H3 and H4, it was found that job satisfaction mediates the relationship between technical and process innovation and employee performance.

Moreover, the acceptance of hypotheses H5 and H6 suggests that change readiness moderates the relationship between technical innovation, process innovation, and employee job satisfaction. This demonstrates that individuals who are more adaptable to change are more likely to view process and technological innovation as opportunities for personal development and advancement, thereby increasing their job satisfaction (Tables 6, 7, and 8).

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Table 2. Reliability and Convergent Validity

Variable	Cronbach's α	CR	AVE
Technological innovation	0.734	0.687	0.73
Change Readiness	0.711	0.601	0.69
Job Satisfaction	0.823	0.760	0.73
Task Performance	0.814	0.731	0.80
Process Innovation capabilities	0.780	0.806	0.76

Table 3. Discriminant Validity

Variable	1	2	3	4	5
Technological innovation	1				
Change Readiness	0.424	1			
Job Satisfaction	0.719	0.521	1		
Task Performance	0.240	0.411	0.534	1	
Process Innovation capabilities	0.431	0.219	0.629	0.528	1

Table 4. Measurement Model Fit Indices

Fit Indices	Overall Model Score	Acceptable Model Fit	Acceptable Baseline
CFI	0.95	Accept	≥0.90
AGFI	0.84	Accept	≥0.80
RMSEA	0.014	Accept	<0.10
CMIN/df	2.41	Accept	<3
TLI	0.92	Accept	≥0.89
IFI	0.94	Accept	≥0.90

Table 5. Structural Model Fit Indices

Fit Indices	Overall Model Score	Acceptable Model Fit	Acceptable Baseline
CFI	0.92	Accept	≥0.90
AGFI	0.88	Accept	≥0.80
RMSEA	0.024	Accept	<0.10
CMIN/df	1.67	Accept	<3
TLI	0.94	Accept	≥0.89
IFI	0.93	Accept	≥0.90

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Table 6. Hypotheses testing

Relationship	t-value	p-value	Status
Process innovation → Task Performance	1.02	0.97	Reject
Technology Innovation → Task Performance	0.96	0.64	Reject

Table 7. Hypotheses Testing – indirect results

Relationship	t-value	p-value	Status
Process innovation → Task Performance	3.87	0.029	Accept
Technology Innovation → Task Performance	4.27	0.018	Accept

Table 8. Hypothesis Testing-Moderation Effects

Relationship	t-value	p-value	Status
Process Innovation * Change readiness → Job Satisfaction	2.91	0.019	Accept
Technology Innovation * Change readiness → Job Satisfaction	3.01	0.024	Accept

DISCUSSION

Literature suggests that technological innovation can improve employee psychological well-being by providing them with the opportunity to participate in the creation of new tools and technologies, equipping them with knowledge and skills, and instilling in them a sense of purpose, autonomy, and accomplishment (Lindholm-Dahlstrand, Andersson, & Carlsson, 2019; Liu, Wang, & Zhu, 2020). In addition, it promotes staff communication and collaboration, as well as innovation, creativity, and problem-solving abilities (Schaufeli, Bakker, & Van Rhenen, 2009). The findings indicate that technological innovation does not enhance worker performance directly.

Process innovation can increase staff efficacy and efficiency by implementing new or noticeably improved production or delivery techniques (Choi, Jang, & Hyun, 2009; Dasgupta & Gupta, 2009; Gunday et al., 2011). Process innovation aims to reduce operating costs, enhance product or service quality, reduce service delivery times, and increase operational flexibility by focusing on new or significantly improved methods of production or service delivery (Walker, 2007). The findings of the second hypothesis, however, indicate that process innovation does not necessarily increase worker productivity.

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When viewed in conjunction with the results of Hypotheses 3 and 4, in which job satisfaction was found to mediate the relationship between technological innovation and process innovation and employee performance, these findings become clearer.

The relationship between employee performance and technological innovation is mediated by job satisfaction. According to Auer Antoncic and Antoncic (2011) and Falkenburg and Schyns (2007), there may be a direct correlation between employee performance and employment satisfaction. When employees are satisfied with their jobs, they are more likely to feel connected to their work, be motivated, and perform better. The results of H3 support the hypothesis that job satisfaction mediates the relationship between technological advancement and employee performance.

In a similar fashion, job satisfaction mediates the relationship between process innovation and employee performance. Job satisfaction may serve as a mediator between process innovation and worker performance by increasing employee motivation and commitment (Falkenburg & Schyns, 2007). By enhancing procedures, boosting productivity, and streamlining tasks, process innovation fosters a progressive workplace. As a consequence of their perception of these process enhancements, employee job satisfaction rises, which in turn increases motivation and output.

Furthermore, it has been observed that the correlation between technological advancements and the level of job satisfaction among workers is influenced by their readiness to adapt to change. The concept of change readiness plays a crucial role in the process of organizational adaptation and performance enhancement. It encompasses an individual's cognitive, emotional, and purposeful orientations toward change (Choi & Ruona, 2011; de Jong, Nikolova, & Caniëls, 2023; Luo et al., 2022). Bouckenooghe, Devos, and Van den Broeck (2009) and Luo et al. (2021) assert that individuals with higher levels of change readiness are inclined to perceive technological innovation as a prospect for personal advancement and professional growth, thereby fostering an enhanced sense of job satisfaction.

The moderating role of change readiness is evident in the relationship between process innovation and employees' job satisfaction. According to previous research (Bouckenooghe, Devos, & Van den Broeck, 2009; Luo et al., 2021), it can be inferred that employees who possess higher levels of change readiness are inclined to view process innovation as favorable prospects for personal and professional advancement. Consequently, this positive perception is likely to result in increased levels of job satisfaction.

Theoretical contribution

This study has made a valuable contribution to the current body of literature by emphasizing the significance of mediating mechanisms that should be taken into account when assessing the correlation between innovation practices and employee performance.

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In general, our findings underscore the relationship between job satisfaction and the impact of technological or process innovation on employee performance within organizational processes. This suggests that the establishment of a conducive working environment holds significance in the process of innovating organizational practices. The consideration of employee satisfaction levels is crucial when examining such relationships, as it plays a pivotal role in determining favorable outcomes. Furthermore, it has been established through this study that the level of change readiness exhibited by employees significantly influences their reactions towards innovation initiatives. Employees who demonstrate a readiness for change are more inclined to experience job satisfaction when organizations introduce innovation in their technology and processes.

Practical Implications

Organizations seeking to enhance employee performance through technological and process innovation should take into account several practical implications. Primarily, it is imperative for businesses to prioritise the enhancement of employee job satisfaction as a means to enhance productivity. This objective can be achieved by providing employees with opportunities to engage in meaningful projects, imparting them with the requisite knowledge and skills, and cultivating a positive work environment that promotes collaboration, communication, and innovation.

Secondly, it is imperative for businesses to consider the role of change preparedness in facilitating the effective implementation of technological advancements and process innovations. Encouraging change readiness within organizations can enhance the capacity of their workforces to adapt to new situations and effectively operate in dynamic environments. The aforementioned objective can be accomplished through the provision of comprehensive training and support to employees, enabling them to enhance their cognitive, emotional, and intentional preparedness in the face of change.

Limitations and directions for future research

One potential limitation of our study is its dependence on a specific context of Saudi organizations. The generalizability of the findings to diverse populations and environments may be limited. The outcomes are additionally contingent upon self-reported data, which may be subject to bias due to respondents' responses. Future research has the potential to address these limitations by conducting replications of the study using diverse samples and varying situations, thereby assessing the generalizability of the findings. Furthermore, in order to mitigate the potential for response bias, future research endeavors could incorporate the utilization of objective measures or diverse data sources.

An area of potential future research could involve investigating the mechanisms through which job satisfaction serves as a mediator in the relationship between technology innovation, process innovation, and employee performance. This analysis may provide a deeper understanding of how these variables interact to influence employee productivity. Further research could investigate the potential influence of additional moderators on the association between process innovation, job satisfaction, and employee performance. This may provide a more comprehensive understanding of the complex relationships among these variables.

Funding

This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduates Studies and Scientific Research, King Faisal University, Saudi Arabia [Project No. GRANT 4059].

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