Environment and Social Psychology (2025) Volume 10 Issue 1 ISSN: 2424-8975 (O)
doi: 10.59429/esp.v10i1.3373 2424-7979 (P)

RESEARCH ARTICLE

Balancing the burden: How job crafting and technological self-efficacy buffer the effect of AI awareness on emotional exhaustion in hotel enterprises?

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ABSTRACT

The integration of AI in hotel enterprises presents both opportunities and challenges. While AI has the potential to automate tasks, increase efficiency, and enhance guest experiences, it may also raise concerns that could negatively impact employees. This paper, grounded in the Job Demands-Resources Model and the Technology Acceptance Model, examines the effect of AI awareness on emotional exhaustion, with a focus on the moderating roles of job crafting and technological self-efficacy in the context of hotel enterprises. To test the hypothesized model, 388 responses from full-time employees working in five-star hotels were analyzed using a PLS-SEM approach. The results revealed a positive correlation between AI awareness and emotional exhaustion. Additionally, the relationship between AI awareness and emotional exhaustion is moderated by technological self-efficacy and job crafting. This research deepens our understanding of how employees in high-contact service industries can adapt to digital transformation while maintaining their well-being. The findings offer valuable insights for hotel management, HR professionals, and policymakers to help support employees in addressing the psychological challenges tied to AI adoption. Moreover, the study emphasizes the role of job crafting and technological self-efficacy in reducing emotional exhaustion, encouraging positive adaptation to AI, and ensuring successful technology integration while prioritizing employee well-being in the hospitality industry.

Keywords: artificial intelligence adoption; psychological challenges; employee responses; five-star hotels

1. Introduction

In recent years, businesses have increasingly embraced artificial intelligence (AI) to boost growth by

ARTICLE INFO
Received: 1 January 2025 | Accepted: 7 February 2025 | Available online: 14 February 2025

CITATION
Salama M. E. W, Khairy HA,Abouelenien REI,et al. Balancing the Burden: How Job Crafting and Technological Self-efficacy Buffer the Effect of AI awareness on Emotional Exhaustion in Hotel Enterprises?. *Environment and Social Psychology* 2025; 10(1): 3373. doi:10.59429/esp.v10i11.3373

enhancing efficiency and cutting costs [1,2]. In the service sector, AI-driven chatbots and virtual assistants are improving customer service[3]. The hospitality industry, particularly five-star hotels, is undergoing a significant transformation with the growing adoption of AI technologies[4]. AI is revolutionizing guest services, operational efficiency, and decision-making processes, creating opportunities for improved customer experiences and business growth. In service settings, AI manifests in both physical forms, such as robots, and virtual forms, like voice assistants[5]. Thanks to advances in robotics and big data, AI is being incorporated into industries such as hospitality, catering, and tourism[6]. Its adoption is seen as a crucial strategy for cutting costs, improving customer service, and enhancing corporate competitiveness[7].

The integration of AI into industries like hospitality creates a paradox. While AI offers many advantages, it also brings challenges, particularly concerning the emotional well-being of employees. Emotional exhaustion, a key contributor to burnout, is a major issue in high-stress fields like hospitality, where workers are under constant pressure to meet demanding service standards. The potential for AI to disrupt the workforce raises concerns about psychological distress for hotel employees[8]. AI could replace up to 95% of jobs in hospitality potentially hindering career growth and negatively affecting employee well-being[9]. As AI advances, frontline workers may increasingly fear their roles becoming obsolete[10]. This fear is captured by the concept of "AI Awareness," introduced by Brougham and Haar[11], which refers to employees' perceptions of AI's impact on their future careers. Research has shown that AI awareness can negatively influence employee outcomes. For example, Kong et al.[12] found that AI awareness was linked to increased job burnout and organizational commitment among hospitality workers, while Ma and Ye[13] observed that heightened AI awareness could lead to service sabotage.

Some workers who interact with AI exhibit negative attitudes, including worry[14], fear[15], and rejection[13]. Moreover, an employee's intention to adopt new technology doesn't always lead to actual usage[16]. Research shows that one-third of assistive technologies are abandoned by users[17], emphasizing the need to understand employees' attitudes toward AI, as their acceptance level directly affects operational efficiency[16]. Additionally, studies suggest that self-efficacy plays a key role in shaping attitudes toward technology adoption. Self-efficacy refers to an individual's belief in their ability to complete tasks in specific situations. Variations in confidence in mastering new technologies can influence employees' attitudes, perceptions of technology's impact, and their behavior[16].

As organizational AI becomes more prevalent, employees are increasingly working in environments characterized by uncertainty and complexity[18]. To cope with these challenges, employees may engage in job crafting—actively reshaping their tasks and roles to better align with evolving organizational needs[6,19]. Given the importance of both organizational and employee adaptability for long-term success, job crafting has attracted considerable research attention[6]. While most studies have focused on the effects of job crafting on employees, such as their sense of meaning, identity[20], perceived employability[21], adaptive performance[22], and job exhaustion[23], the underlying mechanisms driving job crafting remain less explored[6].

Artificial intelligence (AI) has quickly gained prominence in various service industries, especially in tourism and hospitality[24]. Its applications range from AI chatbots assisting guests to AI-powered concierge services[25]. As noted by Liang et al.[26] and Mo et al.[25], more research is needed to understand how AI awareness influences employees' psychological and strategic processes in adapting to and coping with technological changes in both their professional and personal lives. While existing studies have provided valuable insights into AI's impact on employees, they often overlook how employees can adapt and collaborate more effectively with AI. Specifically, there is limited exploration of how individuals can

proactively craft their responses to AI, which could facilitate smoother adaptation[27]. Scholars have called for more research into proactive behaviors that enable better collaboration with AI[28]. Additionally, while AI has led to significant changes in workplace practices[29], the impact of organizational AI adoption on employees' job outcomes remains underexplored[30]. Given that the interaction between AI and people is central to AI research in management[31], studying employees' responses to AI adoption in organizations is crucial[6]. Notably, despite AI's growing role, there is limited empirical research on its direct relationship with emotional exhaustion among employees.

Therefore, this study aims to address gaps in the existing literature by examining the impact of AI awareness on emotional exhaustion among employees in five-star hotel enterprises in Egypt. It also explores the moderating roles of job crafting and technological self-efficacy, investigating how coping mechanisms and confidence in technology impact emotional exhaustion in response to AI integration. By doing so, the research enhances our understanding of how employees in high-contact service sectors can successfully navigate digital transformation without compromising their well-being. The findings are expected to provide valuable insights for hotel management, HR professionals, and policymakers, helping them better support employees in managing the psychological challenges associated with AI adoption. Additionally, the study highlights the importance of supportive job crafting and technological self-efficacy in alleviating employees' emotional exhaustion, fostering positive adaptation to AI technologies, and ensuring both successful technology integration and the well-being of employees in the hospitality industry.

2. Literature review and hypotheses development

To explain the effect of AI awareness on emotional exhaustion in hotel enterprises, with a focus on the moderating roles of job crafting and technological self-efficacy, this study has drawn the theoretical frameworks based on two theories, namely, the Job Demands-Resources (JD-R) Model and Technology Acceptance Model (TAM).

2.1. Job demands-resources (JD-R) model

The Job Demands-Resources (JD-R) Model, developed by Demerouti et al.[32], provides a comprehensive framework for understanding how job characteristics influence employee well-being and performance. The model posits that every job involves both demands—such as high workload, time pressure, or emotional strain—that require sustained effort, and resources—such as social support, autonomy, and growth opportunities—that help employees manage these demands and achieve their goals. When job demands exceed available resources, employees may experience stress and burnout. However, adequate resources can buffer the negative effects of demands, enhancing engagement, motivation, and performance. The model highlights two key processes: a health impairment process, where excessive demands lead to burnout, and a motivational process, where job resources foster engagement and positive outcomes. Ultimately, the balance between job demands and resources plays a crucial role in shaping employees' work experiences[33].

In the context of AI awareness, the JD-R model offers a valuable lens for understanding how AI-related demands can impact emotional exhaustion among hotel employees. The introduction of AI technologies within hotel enterprises may be perceived as a significant job demand, as employees may feel pressure to adapt to new technologies, learn new skills, and cope with concerns about job displacement. According to the JD-R model, when these demands outweigh the available resources, such as support systems or opportunities for skill development, emotional exhaustion is more likely to occur[34]. Conversely, when

employees have sufficient resources to manage the demands of AI adoption, the negative effects on their well-being can be mitigated[35].

2.2. Technology acceptance model (TAM)

The Technology Acceptance Model (TAM), developed by Davis[36], explores users' acceptance of information systems based on the theory of rational behavior and has been widely applied in AI adoption research[37,38,16]. TAM focuses on two key factors: perceived ease of use and perceived usefulness. Perceived ease of use refers to the belief that using a technology will be effortless, while perceived usefulness is the belief that the technology will enhance job performance or help achieve personal goals. When users view technology as both easy to use and beneficial, they are more likely to develop a positive attitude, increasing their intention to use it and leading to actual adoption. While TAM has evolved to include factors like social influence and trust, its central premise remains that perceived ease of use and perceived usefulness drive technology acceptance[39]. This model serves as a useful framework for understanding how AI awareness can affect emotional exhaustion among hotel employees, particularly when considering the moderating roles of job crafting and technological self-efficacy.

2.3. AI awareness and emotional exhaustion

Emotional exhaustion is a state of fatigue resulting from the depletion of emotional and psychological resources due to work-related stressors[40]. As AI becomes more prevalent in service industries, employees with high AI awareness may feel uncertain about their future roles within their organizations and the wider industry[41]. Several studies have found a positive link between AI awareness and work insecurity[42], with job insecurity further intensifying psychological distress and contributing to emotional exhaustion[43]. Research by Liang et al.[26] and Teng et al.[8] shows that when AI awareness is perceived as a stressor, it can significantly increase emotional exhaustion. Emotional exhaustion, often triggered by workplace stressors like job insecurity, poor superior-subordinate relationships, and organizational injustice is a common response to stress[44,45,46].

According to the JD-R model, AI awareness can positively predict emotional exhaustion among employees[26]. Specifically, AI awareness can act as a job demand that intensifies stress for employees. As hotel workers become more aware of AI's increasing role, they may feel anxiety over its implications, such as concerns about job security or the added responsibility of overseeing AI systems. This heightened awareness can increase the pressure to adapt to new technologies, leading to feelings of being overwhelmed and, ultimately, emotional exhaustion. If employees feel inadequately prepared to manage the demands of AI integration, they may experience burnout while attempting to cope with these technological challenges. In line with the JD-R model, this strain from high job demands can deplete employees' emotional resources, resulting in fatigue, disengagement, and emotional exhaustion.

In the context of hotel enterprises, AI awareness can influence emotional exhaustion through employees' perceptions of AI's usefulness and ease of use. When employees are introduced to AI technologies, their awareness of the technology's potential impact shapes their views on how easily they can integrate it into their work routines and its overall usefulness. If employees perceive AI as beneficial—such as improving operational efficiency or enhancing customer service—it may alleviate stress and anxiety related to technological changes. However, if they perceive AI as difficult to use or as a threat to their job security, it may heighten feelings of uncertainty and stress, leading to emotional exhaustion. According to the Technology Acceptance Model (TAM), when employees perceive AI as hard to use, they may feel overwhelmed by its complexity, resulting in increased cognitive and emotional strain[47], which can directly lead to emotional exhaustion.

In addition, the introduction of AI robots into the workplace may unintentionally harm employees psychologically, affecting their emotional connection to their jobs and their sense of belonging and commitment[1]. As AI, automation, and robotics continue to advance, they are expected to significantly impact job roles, working hours, relationships with colleagues and managers, and compensation structures[1]. This highlights how AI awareness can have depleting effects on employees. AI awareness represents a job demand that requires employees to invest significant resources and energy. Over time, these demands can accumulate, leading to emotional exhaustion[26]. As AI adoption grows in hotels, employees may feel uncertain about their future career prospects, which could result in negative work outcomes and feelings of pessimism[26]. AI awareness has been linked to higher risks of depression, job burnout, and emotional exhaustion [48]. Additionally, the implementation of AI raises concerns about potential job displacement[8] further increasing job insecurity and contributing to heightened emotional strain among employees[42]. Consequently, the following hypothesis is formulated:

H1: AI awareness increases emotional exhaustion among hotel employees.

2.4. The moderating role of job crafting

Job crafting refers to the proactive changes employees make to their work, including adjustments to tasks, relationships, and cognitive perceptions of their roles[49]. By redefining and redesigning aspects of their work, employees can make their jobs more meaningful and fulfilling, ultimately enhancing their well-being[50,51]. This process involves modifying tasks and relationships, enabling employees to reframe the purpose of their job in a broader context[49]. According to the JD-R model, job crafting operates within a motivational process, where resources possess the potential to enhance motivation. Employees who have access to resources are likely to use them to acquire even more, leading to increased well-being and engagement[33]. Tims and Bakker[52] further conceptualized job crafting as an active process, where employees adjust their job demands and resources to better align their personal needs, abilities, and job characteristics. This proactive approach not only helps employees cope with job demands but also fosters a sense of autonomy and control, which can buffer against stressors such as those introduced by AI awareness.

The JD-R model suggests that the negative effects of job demands can be mitigated by the availability of job resources. In this context, job crafting is a key resource that can buffer the impact of AI awareness on emotional exhaustion[53,54]. Job crafting involves employees proactively modifying their roles and work environments to better suit their strengths, preferences, and values. When AI is integrated, employees who engage in job crafting may adjust their tasks by emphasizing areas that require human interaction or creativity, rather than focusing on tasks that AI can automate. This flexibility helps reduce the perceived threat of AI by enabling employees to reshape their roles in ways that make them feel more in control and less vulnerable to technological changes. Through job crafting, employees can better manage the demands imposed by AI, reducing emotional exhaustion as they feel empowered and more capable of adapting to technological shifts.

In addition, job crafting plays a significant role in moderating the relationship between AI awareness and emotional exhaustion by influencing employees' perceptions of AI's usefulness and ease of use. Job crafting refers to the proactive steps employees take to shape their work environment, tasks, and relationships to better align with their skills and interests [55]. In the context of AI integration, employees who engage in job crafting may adjust their roles to focus on tasks that are less likely to be automated, such as interpersonal interactions with customers. This shift can help reduce the perception of AI as a threat to job security while enhancing its perceived usefulness—as AI can be seen as a tool that supports rather than replaces human work. Furthermore, job crafting may encourage employees to become more familiar with AI

by taking the initiative to learn how AI systems work, thus reducing the perceived difficulty of using the technology. By gaining more control over how AI is incorporated into their work, employees may experience less stress and emotional exhaustion, feeling more competent in managing technological changes.

Furthermore, the job crafting literature suggests that individuals are not passive recipients of environmental changes but can actively shape their work roles[56,57,27]. In response to evolving work designs, job crafting serves as an effective strategy for improving job fit and enhancing performance[58]. As AI becomes increasingly integrated into the workplace, some employees may proactively adapt to changes in job design and work boundaries, helping them regain a sense of control over their roles[28,59]. A common proactive coping strategy involves employees crafting their job roles to better align with working alongside AI, allowing them to shape tasks and interactions in ways that complement the technology rather than feeling threatened by it [27,28]. This approach helps maintain a sense of agency and reduces negative emotional impacts, such as stress and emotional exhaustion, resulting from AI integration. Based on this, the following hypothesis is proposed:

H2: Job crafting moderates the relationship between AI awareness and emotional exhaustion among hotel employees, job crafting dampens the impact of AI awareness on emotional exhaustion.

2.5. The moderating role of technological self-efficacy

Self-efficacy refers to an individual's belief in their ability to perform a specific task in a given situation, while technological self-efficacy extends this concept to an individual's confidence in using new technology[16]. Technological self-efficacy is considered a critical cognitive evaluation of one's ability to successfully master and utilize technology[60]. Individuals with higher levels of technological self-efficacy are more likely to approach new technologies with a positive attitude, viewing them as manageable and beneficial, while those with lower self-efficacy may experience anxiety and uncertainty, leading to avoidance or negative reactions[61]. In situations involving uncertainty, such as the introduction of AI in the workplace, employees with high technological self-efficacy are more likely to adopt effective coping strategies and engage with the technology, while those with lower self-efficacy may struggle, resulting in stress and decreased job satisfaction[16].

Technological self-efficacy, which refers to an individual’s confidence in their ability to successfully use and adapt to new technologies, is another key job resource[62]. According to the JD-R model, employees with high technological self-efficacy are more likely to perceive AI as a manageable and helpful tool rather than a source of stress. Their confidence in using AI systems reduces the perceived difficulty of learning and adapting to new technologies, making challenges seem less threatening. This belief in their technological competence helps mitigate the stress and anxiety that might arise from AI awareness, allowing employees to feel more in control of the situation. As a result, technological self-efficacy acts as a buffering resource, reducing strain from high job demands and preventing emotional exhaustion. In contrast, employees with low technological self-efficacy may struggle to adapt, experiencing increased stress and frustration[63], which can heighten their emotional exhaustion.

According to the Technology Acceptance Model (TAM), employees who feel confident in their ability to use new technologies—those with high technological self-efficacy—are more likely to perceive AI as both useful and easy to use. When employees believe they have the necessary skills and knowledge to successfully interact with AI systems, they are less likely to feel overwhelmed or stressed by the technology[64]. In contrast, employees with low technological self-efficacy may view AI as complex or threatening, increasing their perception of difficulty in using it. This heightened sense of challenge can lead to higher levels of stress and emotional exhaustion. Therefore, high levels of technological self-efficacy can

mitigate the negative emotional impact of AI awareness by fostering a sense of competence and confidence in handling technological change.

In addition, researchers such as Agourram et al.[65] and Ibrahim et al.[66] have emphasized the importance of technological self-efficacy in enhancing the effectiveness of technology adoption and usage. They argue that higher technological self-efficacy improves users' satisfaction with technology, increasing their likelihood of successfully adopting and utilizing it, which ultimately enhances task effectiveness[67]. Therefore, technological self-efficacy is expected to play a critical role in moderating the relationship between AI awareness and emotional exhaustion. Employees with higher technological self-efficacy are more likely to perceive AI as manageable and beneficial, which can reduce stress and alleviate emotional exhaustion associated with adapting to new technologies. On the other hand, employees with lower self-efficacy may struggle with AI integration, leading to increased stress and emotional depletion. Based on this, the following hypothesis is proposed:

H3: Technological self-efficacy moderates the relationship between AI awareness and emotional exhaustion among hotel employees, technological self-efficacy dampens the impact of AI awareness on emotional exhaustion.

The theoretical framework of the study is illustrated below in **Figure 1**.

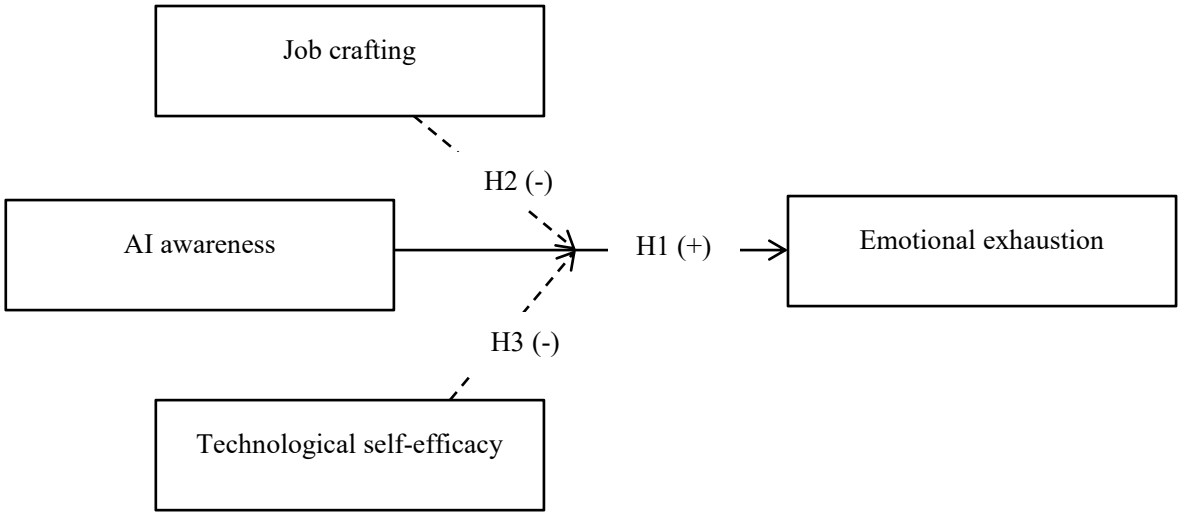

Figure 1. The theoretical framework of the study.

3. Materials and methods

3.1. Instrument development and measures

The study employs a quantitative research design to investigate the relationships between artificial intelligence awareness, emotional exhaustion, job crafting, and technology self-efficacy within the hotel sector. A survey methodology has been used, structured into two sections: the first section will focus on measuring the latent variables (AI awareness, emotional exhaustion, job crafting, and technology self-efficacy), while the second will gather information on the characteristics of the research sample. This design aims to provide a comprehensive understanding of how these factors interact and influence each other in the context of AI integration in the hotel industry.

In this study, all variables of interest were measured using established scales, adapted from prior literature, and assessed on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). AI awareness was measured with a four-item scale from Brougham and Haar[11], while emotional exhaustion

was assessed using eight items from the Maslach and Jackson[68] scale. Job crafting was evaluated using a 10-item scale from Cheng and Yi[51], and technology self-efficacy was measured with a 5-item scale from McDonald and Siegall[69]. The scales were translated from English to Arabic following Brislin's[70] standard translation and back-translation procedures. A bilingual translator first translated the original questionnaire into Arabic. Then, a second bilingual translator, unaware of the original text, translated the Arabic version back into English. This back-translation process helped identify any discrepancies or inaccuracies, ensuring that the meaning of the questions was preserved in both languages. As a result, the process enhanced the reliability and validity of the questionnaire for Arabic-speaking participants, making it suitable for the study. All items are detailed in Appendix A.

3.2. Sampling and data collection

Employees at five-star hotels provide an ideal sample for this study due to their exposure to high-pressure, customer-oriented environments, where human interaction and creativity are essential. These employees are likely to experience the integration of AI technologies into their daily tasks, as many five-star hotels adopt advanced technological systems. This makes them particularly relevant for examining how AI awareness influences emotional exhaustion, job crafting, and technology self-efficacy. Moreover, the high demands and stress levels associated with working in such settings make employees more sensitive to changes in job requirements, offering an opportunity to explore how they manage these pressures through strategies like job crafting.

Data for this study were collected from full-time employees at five-star hotels in the Greater Cairo region, Egypt. According to the Egyptian Ministry of Tourism and Antiquities[71], there were 30 five-star hotels listed in Greater Cairo in 2022. These hotels, known for their high-end services, often integrate advanced technologies like AI into their operations, making them an ideal context to study the effects of AI awareness on emotional exhaustion, job crafting, and technological self-efficacy. Employees in these hotels face unique job demands and challenges, offering valuable insights into how they adapt to technological changes and manage associated stress.

The study applies Cochran's[72] sampling equation to determine the ideal sample size, given the lack of official data on the total workforce of Egypt's five-star hotels. Cochran's formula, designed to calculate a representative sample size for large populations, indicates that at least 385 responses are needed. Here is the formula in details:

$$n_0 = \frac{Z^2pq}{e^2} = \frac{(1.96)^2(.5)(.5)}{(.05)^2} = 385$$

Where "n_0 is the sample size, Z^2 is the abscissa of the normal curve that cuts off an area a at the tails (1 - a equals the desired confidence level, e.g., 95%), e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is $1-p$".

A total of 500 questionnaires were distributed across 22 hotels that agreed to participate. Due to logistical constraints and the widespread nature of hotels in Egypt, a convenience sampling method was used. The response rate was 64.7%, yielding 388 valid questionnaires for analysis.

3.3. Data analysis

Data analysis for this study was conducted using WarpPLS 7.0, a statistical software widely employed for PLS-SEM [73]. PLS-SEM is chosen for two main reasons. First, it offers greater flexibility and is well-suited for theory development and testing at the early stages of model building. It allows examining

relationships between variables even when theory or empirical validation is limited. Second, PLS-SEM is robust to violations of normality, meaning it does not require data to follow a normal distribution. This makes it particularly useful for handling skewed or non-normal data distributions, which are often encountered in many applied research fields. To assess non-response bias, t-tests were conducted to compare responses from early and late respondents. Since late respondents are considered to resemble non-respondents more closely, the absence of significant differences ($p > 0.05$) indicated that non-response bias was not a concern and that the sample was representative. Additionally, common method bias (CMB), which could arise from the use of self-reported data, was evaluated using Harman's single-factor test. The results showed that no single factor accounted for more than 50% of the variance, indicating that CMB was not a significant issue, thus confirming the robustness and reliability of the data.

4. Results

4.1. Participant's profile

Table 1 presents the demographic profile of 388 participants. The majority of participants were male (66.32%), while 34.99% were female. In terms of age, most participants were between 30 and 39 years old (39.95%), followed by those aged 40 to 49 years (28.20%). The educational background was predominantly bachelor's degree holders (71.54%), with fewer participants holding high school certificates (8.09%) or advanced degrees (21.67%). Regarding marital status, most were married (69.45%), followed by single participants (26.89%). The table also notes that all participants had at least one year of work experience, ensuring they could provide informed insights into organizational culture and norms.

Table 1. Participant's profile (N=388).

		Frequency	Percent
Gender	Male	254	66.32
	Female	134	34.99
Age	< 30 years	52	13.58
	30 : < 40 years	153	39.95
	40: 50 years	108	28.20
	>50	75	19.58
Education	High schools	31	8.09
	Bachelor	274	71.54
	Master/PhD	83	21.67
Marital status	Single	103	26.89
	Married	266	69.45
	Divorced	14	3.66
	Widow	5	1.31

A minimum of one year of work experience was required to ensure that respondents could objectively evaluate the variables being studied. Morrison [74] suggests that employees generally gain an understanding of an organization's culture and established norms within six months of starting their employment.

4.2. Measurement model

The assessment of the four-factor model, which includes AI awareness (AIA), emotional exhaustion (EEX), technological self-efficacy (TSE), and job crafting (JC), was carried out using Kock's[72] ten-fit

indices, as detailed in Appendix (B). All the fit indices provide strong support for the model, confirming its value as a framework for understanding the relationships between these variables.

Table 2 presents the measurement properties of the four investigated constructs. Each construct includes multiple indicators with factor loadings ranging from 0.618 to 0.854, indicating good to strong relationships between indicators and constructs. The CR and CA values suggest good internal consistency across all constructs, with job crafting showing the highest reliability. The AVE values range from 0.522 to 0.643, indicating moderate to good convergent validity. The VIF values, which range from 1.137 to 1.862, are significantly lower than 3.3, indicating no issues with multicollinearity. Overall, **Table 2** provides a clear summary of the reliability and validity of the constructs used in the study, confirming that the measures are both reliable and valid for the research.

Table 2. Item loadings, cronbach alpha, CR, AVE, and VIFs.

Construct	Indicators	Loading	CR	CA	AVE	VIF
AI awareness (AIA)	Item.1	0.772	0.813	0.693	0.522	1.137
	Item.2	0.748				
	Item.3	0.653				
	Item.4	0.711				
Emotional Exhaustion (EEX)	Item.1	0.755	0.886	0.851	0.526	1.862
	Item.2	0.632				
	Item.3	0.758				
	Item.4	0.718				
	Item.5	0.792				
	Item.6	0.664				
	Item.7	0.698				
	Item.8	0.772				
Technological Self-efficacy (TSE)	Item.1	0.674	0.862	0.800	0.556	1.632
	Item.2	0.755				
	Item.3	0.750				
	Item.4	0.758				
	Item.5	0.787				
Job Crafting (JC)	Item.1	0.805	0.947	0.937	0.643	1.190
	Item.2	0.798				
	Item.3	0.830				
	Item.4	0.836				
	Item.5	0.854				
	Item.6	0.852				
	Item.7	0.806				
	Item.8	0.815				
	Item.9	0.781				
	Item.10	0.618				

"CR: Composite reliability; CA: Cronbach's alpha; AVE: average variance extracted; VIF: variance inflation factors ".

Table 3 presents the discriminant validity results based on the Fornell-Larcker Criterion. The diagonal values show that each construct's AVE is higher than its correlations with other constructs, which supports discriminant validity. For instance, the square root of AVE for TSE is 0.746, which is greater than its correlations with other constructs (0.588 with **EEX**, 0.192 with AIA, and 0.372 with JC). Similar patterns are observed for EEX, AIA, and JC, where the diagonal values are consistently higher than the off-diagonal correlations, confirming that the constructs are distinct from each other.

Table 3. Discriminant validity results - fornell-larcker criterion.

	TSE	EEX	AIA	JC
Technological Self-efficacy (TSE)	0.746	0.588	0.192	0.372
Emotional Exhaustion (EEX)	0.588	0.706	0.337	0.316
AI awareness (AIA)	0.192	0.337	0.723	0.175
Job Crafting (JC)	0.372	0.316	0.175	0.802
"Off-diagonal elements are correlations and diagonal elements are square roots of AVE"				

Table 4 presents the HTMT ratios and associated p-values for testing discriminant validity. The HTMT ratios, which should ideally be below 0.85 and not exceed 0.90, indicate that all constructs are distinct from one another. For instance, the ratio between TSE and EEX is 0.723, well below 0.90, while other ratios, such as between TSE and AIA (0.276) and TSE and JC (0.429), also show good discriminant validity. The p-values for all HTMT ratios are less than 0.05, further supporting the distinctiveness of the constructs. Overall, the results demonstrate strong discriminant validity.

Table 4. HTMT for validity.

"HTMT ratios (good if < 0.90, best if < 0.85)"	**TSE**	**EEX**	**AIA**	**JC**
Technological Self-efficacy (TSE)				
Emotional Exhaustion (EEX)	0.723			
AI awareness (AIA)	0.276	0.460		
Job Crafting (JC)	0.429	0.361	0.225	
"P values (one-tailed) for HTMT ratios (good if < 0.05)"	TSE	EEX	AIA	JC
Technological Self-efficacy (TSE)				
Emotional Exhaustion (EEX)	<0.001			
AI awareness (AIA)	<0.001	<0.001		
Job Crafting (JC)	<0.001	<0.001	<0.001	

4.3. Structural model and hypotheses testing

Figure 2 and **Table 5** provide an overview of the direct and moderating effects among the hypothesized relationships involving AI awareness (AIA), emotional exhaustion (EEX), technological self-efficacy (TSE), and job crafting (JC). **Figure 2** illustrates a positive correlation between AI awareness and emotional exhaustion (EEX) (β=0.32, P<0.01; T=6.639), indicating that higher AI awareness leads to an increase in employees' emotional exhaustion, thus supporting H1. Furthermore, the relationship between AI awareness and emotional exhaustion is moderated by technological self-efficacy (TSE) (β=-0.55, P<0.01; T=-11.677) and job crafting (JC) (β=-0.34, P<0.01; T=-6.959). Both technological self-efficacy and job crafting reduce the positive correlation between AI awareness and emotional exhaustion, supporting H2 and H3.

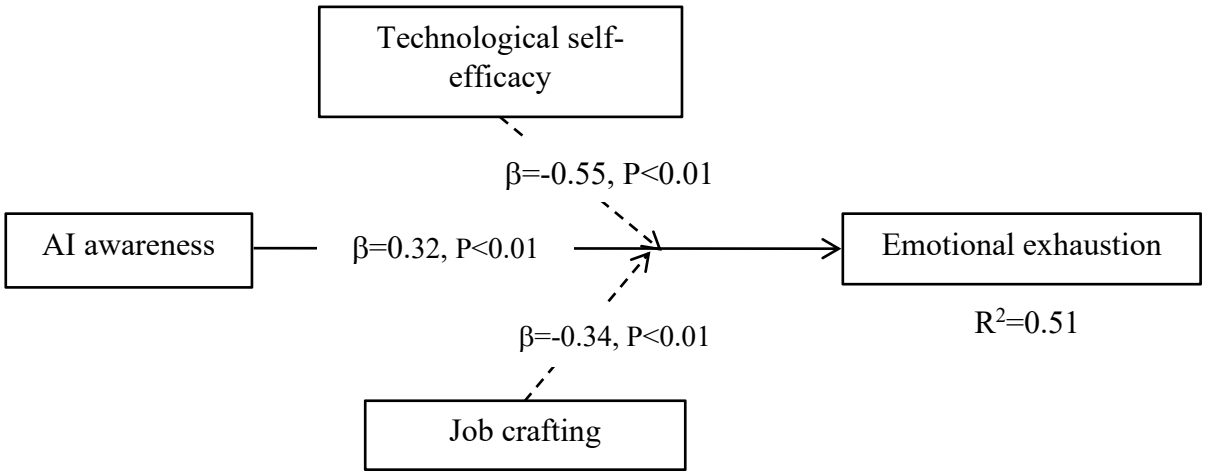

Figure 2. The final model of the study.

Table 5. Effect sizes (f^2) for total effects.

Effect sizes (f^2) for total effects	AIA	TSE*AIA	JC*AIA
Emotional Exhaustion (EEX)	0.149	0.255	0.110

According to Cohen's[75] guidelines, effect sizes (f^2) are classified as follows: $f^2 \geq 0.02$ indicates a small effect size, $f^2 \geq 0.15$ represents a medium effect size, and $f^2 \geq 0.35$ denotes a large effect size. In Table 5, the effect sizes (f^2) for the total effects of various constructs on EEX are provided. The effect size for AIA on EEX is 0.149, indicating a medium effect. The interaction between TSE and AIA has a medium effect size of 0.255, reflecting a medium to large effect. In contrast, the interaction between JC and AIA shows a medium effect size of 0.110, suggesting a small to medium impact. Overall, AI Awareness has a moderate influence on emotional exhaustion, with stronger interactions when combined with technological self-efficacy and job crafting.

5. Discussion

The integration of AI in hotel enterprises offers both opportunities and challenges. While AI can automate tasks, improve efficiency, and enhance guest experiences, it can also lead to employee anxieties and concerns, potentially impacting their well-being. This paper explores the relationship between AI awareness and emotional exhaustion, focusing on the moderating roles of job crafting and technological self-efficacy in the context of hotel enterprises.

Findings revealed a positive relationship between AI awareness and emotional exhaustion, consistent with previous research by Liang et al.[26] and Teng et al.[8], which suggested that AI awareness increases employees' emotional exhaustion. As employees become more aware of AI's potential impacts on their roles, they may experience heightened stress, anxiety, and uncertainty about job security and the evolving technological landscape, leading to greater emotional depletion. Awareness of AI's implications—such as the need to adapt to new technologies or the fear of job displacement—significantly contributes to emotional exhaustion. AI awareness can deplete employees' emotional resources, leading to burnout and fatigue[26]. With AI adoption, employees with high levels of AI awareness may experience job insecurity due to concerns over their future roles within their organizations[11]. This awareness can also lead to anxiety, undermining work self-efficacy[76]. Negative emotions, such as resentment and depression, emerge from the belief that AI may hinder career progression, which, according to Maslach et al.[40], shifts from surface-level

emotions to deeper emotional depletion, exacerbating emotional exhaustion[26]. Additionally, AI's ability to perform a wider range of tasks and operate longer hours creates significant psychological stress for employees who must compete with these technological capabilities, depleting their psychological resources[8]. The introduction of AI imposes new job demands, increasing pressure and contributing to emotional strain[77]. In essence, AI awareness contributes to emotional exhaustion in several ways. It increases job demands by requiring employees to adapt to new technologies, acquire new skills, and take on additional responsibilities, which can cause stress. The perception of AI as a job threat further exacerbates emotional exhaustion by generating feelings of anxiety, fear, and insecurity. Finally, as AI automates certain tasks, it reduces opportunities for social interaction, leading to isolation and loneliness, and intensifying emotional fatigue. These factors underscore the complex relationship between AI awareness and emotional well-being in the workplace.

Findings revealed that job crafting moderates the effect of AI awareness on emotional exhaustion, dampening the negative effects of AI awareness, consistent with previous research by Cheng et al.[6] and Kang et al.[78]. Job crafting serves as a crucial buffer in this relationship by enabling employees to proactively shape their roles and work environment in ways that reduce stress and increase job satisfaction. First, job crafting increases job resources by enhancing employees' sense of autonomy, control, and social support, which can mitigate the negative effects of AI awareness. When employees feel more in control of their tasks and responsibilities, they are better able to manage the challenges posed by AI. Second, job crafting allows employees to reduce job demands by adjusting their roles to lower excessive workloads, eliminating unnecessary tasks, and improving their work-life balance. These adjustments can lessen the burden of adapting to new technologies and reduce feelings of overwhelm. Lastly, job crafting helps increase meaningfulness by allowing employees to find purpose and significance in their work. By aligning their roles with their values and strengths, employees are better able to cope with the uncertainties introduced by AI integration.

Employees engage in job crafting as a proactive strategy to reduce the uncertainty and ambiguity caused by AI awareness[78]. Research indicates that employees are more likely to craft their jobs when they face uncertain or challenging work conditions[56]. As AI continues to reshape the career landscape[79], organizations must consider how AI adoption influences employees' job-crafting behaviors[6]. Studies show that job crafting can enhance employees' motivation, health, and performance[80]. In the context of AI awareness, for instance, tourism employees may perceive their roles as uncertain or complex[12]. In response, they can proactively redesign their roles to better align with their skills, preferences, and demands, a process known as job crafting [49,24]. This proactive approach helps employees regain a sense of control, reduce stress, and adapt more effectively to the changing technological environment, thereby reducing emotional exhaustion. Overall, job crafting serves as a key resource that enables employees to manage the challenges posed by AI awareness and reduce the negative impact of these challenges on their emotional well-being.

Lastly, findings revealed that technological self-efficacy moderates the effect of AI awareness on emotional exhaustion, dampening the negative effects of AI awareness, in line with research by Agourram et al.[65] and Ibrahim et al.[66]. Technological self-efficacy (TSE) refers to an individual's confidence in their ability to successfully use and learn new technologies. This self-confidence plays a significant role in moderating the stress and anxiety employees may experience due to AI awareness, ultimately reducing the risk of emotional exhaustion. First, technological self-efficacy helps reduce anxiety. Employees with high TSE feel more confident in their ability to adapt to AI technologies, which alleviates fears and stress about the potential challenges associated with AI. When employees believe they can successfully navigate technological changes, their emotional response to these changes is less likely to result in burnout or fatigue.

Second, TSE can increase engagement. Employees who possess high self-efficacy are more motivated to learn new skills and embrace AI, which can lead to higher job satisfaction and decreased emotional exhaustion. High levels of confidence in one's technological capabilities also encourage proactive behavior, such as seeking additional training or using AI tools more effectively, which ultimately helps reduce stress. Lastly, TSE contributes to improved performance. Employees with strong technological self-efficacy are more likely to excel in their use of new technologies, which boosts their self-esteem and job satisfaction. As their performance improves, employees experience a sense of mastery, which can help mitigate the stress and anxiety associated with AI awareness, reducing the risk of emotional exhaustion. Additionally, self-efficacy generally refers to an individual's belief in their ability to successfully carry out a plan of action in various situations [81]. In the context of technology, technology self-efficacy (TSE) is the belief in one's ability to perform technologically complex tasks effectively[82]. Peterson[83] defined TSE as the confidence individuals have in their ability to use technology to enhance their performance. Past research has assessed TSE in various forms, including Internet self-efficacy[84], mobile technology self-efficacy[85], and online technology self-efficacy[86]. Studies have shown that higher TSE positively affects job satisfaction, performance, and work engagement[87]. Winarno et al.[88] found that TSE enhances technology use by making it more enjoyable and reducing work-related challenges. Researchers such as Yeşilyurt et al.[89] and Ibrahim et al.[66] have also highlighted that TSE improves attitudes toward technology adoption and reduces negative emotions, such as anxiety, frustration, and anger, associated with technology use[90]. These findings emphasize the importance of TSE as a key resource for alleviating the emotional burden of AI awareness and preventing emotional exhaustion. In summary, high TSE helps employees view AI as a manageable tool rather than a source of stress. By reducing anxiety, boosting engagement, and improving performance, TSE plays a crucial role in buffering the negative emotional impact of AI awareness, enhancing employees' ability to adapt to technological changes, and ultimately reducing the risk of emotional exhaustion.

6. Theoretical implications

This study makes a significant theoretical contribution by integrating two well-established frameworks—the Job Demands-Resources (JD-R) Model and the Technology Acceptance Model (TAM)—to examine the relationship between AI awareness, job crafting, technological self-efficacy, and emotional exhaustion in the context of five-star hotel enterprises in Egypt. This approach provides a comprehensive understanding of how these factors interact and influence employee well-being in a rapidly evolving technological environment.

First, the JD-R Model is used to explain the dynamics between job demands and resources and their impact on emotional exhaustion. According to this model, emotional exhaustion arises when job demands exceed available resources. In this context, AI awareness can be seen as a potential stressor or demand, causing psychological strain due to employees' concerns or limited understanding of new technologies. However, the study suggests that job crafting—a proactive behavior where employees modify their tasks and relationships to better align with their capabilities and interests—acts as a key job resource. Job crafting helps employees manage the demands of AI integration by fostering autonomy, control, and engagement, thereby mitigating the negative effects of AI awareness on emotional exhaustion. By integrating job crafting within the JD-R framework, this study offers a novel perspective on how employees can actively shape their work environment to reduce emotional stress. Second, the Technology Acceptance Model (TAM) is used to explore how technological self-efficacy can buffer the negative impact of AI awareness on emotional exhaustion.

TAM traditionally examines how perceived ease of use and perceived usefulness influence individuals' acceptance of technology. This manuscript extends the model by incorporating technological self-efficacy, which refers to an individual's belief in their ability to effectively use technology. By enhancing technological self-efficacy, employees are likely to perceive AI tools as more useful and easier to use, reducing the anxiety and emotional strain that typically accompany the introduction of new technologies. This, in turn, helps alleviate emotional exhaustion, as employees feel more competent and confident in managing AI-driven changes in their work environment. The manuscript's application of TAM highlights the importance of fostering technological self-efficacy to mitigate the emotional challenges associated with AI awareness. Together, the integration of the JD-R model and TAM in this study advance theoretical understanding by providing a dual perspective on how personal and technological resources—job crafting and technological self-efficacy—can mitigate the emotional strain caused by AI awareness. This combined approach contributes to the broader literature by offering new insights into how the hospitality sector, particularly five-star hotels, can manage the emotional well-being of their employees amidst the increasing adoption of AI technologies.

7. Practical implications

This study offers several practical contributions for five-star hotel enterprises in Egypt to address the challenges associated with AI integration, particularly regarding employee emotional exhaustion. By focusing on job crafting, technological self-efficacy, and a supportive work environment, hotel management can effectively reduce the negative impact of AI awareness on employees' well-being.

First, promoting job crafting is a key practical recommendation. Encouraging employees to actively shape their work experiences through job crafting initiatives can significantly improve job satisfaction and reduce emotional exhaustion. Job crafting allows employees to customize their roles by altering their tasks, interactions, and work environment to better align with their skills and interests. Hotel management should create an environment that fosters autonomy and empowers employees to take ownership of their job responsibilities. By doing so, employees can gain a greater sense of control over their work, which can alleviate stress and enhance their ability to adapt to new technologies like AI. Second, investing in training and development is critical to boosting employees' technological self-efficacy. Providing ongoing training programs focused on improving technological skills is essential for reducing anxiety and enhancing confidence in using AI systems. These training sessions should not only focus on the technical aspects of AI tools but also aim to build employees' belief in their ability to successfully use these technologies. When employees feel competent and equipped to handle AI-related tasks, they are less likely to experience emotional exhaustion. By continuously investing in professional development, hotel enterprises can ensure that their employees are both capable and confident in adapting to AI-driven changes in their work. Third, creating a supportive work environment is crucial for mitigating emotional exhaustion. A work culture that promotes open communication, collaboration, and emotional well-being can significantly ease the challenges posed by AI integration. Hotel managers should foster an inclusive environment where employees feel comfortable expressing their concerns, asking for help, and collaborating with colleagues. Providing regular opportunities for feedback and offering mentorship programs can also strengthen peer relationships and offer emotional support. In addition, integrating wellness programs that focus on mental health and stress management can further contribute to reducing the emotional strain that employees may experience as they navigate the complexities of AI implementation. Finally, addressing ethical concerns related to AI implementation is essential to build trust and reduce employee anxiety. Hotel management should engage in transparent communication about how AI is being used within the organization, particularly concerning data

privacy, job security, and the ethical implications of technology. When employees understand that AI technologies are being used responsibly and with their best interests in mind, they are more likely to feel secure in their roles and less anxious about technological advancements. Establishing clear policies around ethical AI use and encouraging open dialogue about potential concerns can help create a more trusting and supportive workplace.

8. Limitations and further research

While this study provides valuable insights into the relationship between AI awareness, job crafting, technological self-efficacy, and emotional exhaustion in five-star hotel enterprises in Egypt, several limitations suggest important avenues for future research. One significant limitation is the context-specific nature of the study, which focuses on hotel enterprises in Egypt. The findings may not be directly applicable to other cultural or organizational settings where AI integration, workforce dynamics, and management practices differ. To address this, future research could expand the scope of the study to include other industries and countries, comparing how the interplay between AI awareness, job crafting, and technological self-efficacy varies across different contexts. Additionally, this study is based on a cross-sectional design, which limits the ability to conclude causality. The relationship between AI awareness and emotional exhaustion, for example, may change over time as employees gain more experience with AI systems. Therefore, longitudinal studies are recommended to track these relationships over a longer period, providing insights into how the effects of AI awareness, job crafting, and technological self-efficacy evolve and influence emotional exhaustion in the long run. Another limitation is the reliance on self-reported data, which is susceptible to biases such as social desirability or inaccurate recall, potentially affecting the validity of the results. Future studies could incorporate more objective measures of emotional exhaustion, job crafting, and technological self-efficacy, such as behavioral data, performance evaluations, or physiological indicators, to reduce reliance on self-reports and provide a more comprehensive view of employee well-being.

Building on these limitations, several avenues for further research emerge. First, investigating the specific mechanisms through which job crafting and technological self-efficacy moderate the relationship between AI awareness and emotional exhaustion could provide deeper insights. Researchers could explore which aspects of job crafting (e.g., task crafting, relational crafting, cognitive crafting) most effectively mitigate emotional exhaustion in the context of AI awareness, and how technological self-efficacy specifically impacts emotional resilience. This could help identify targeted strategies to enhance employee well-being. Another important direction for future research is to examine the impact of different AI implementation strategies on employee well-being and job performance. As AI is being adopted at varying rates and in different forms across organizations, understanding how different implementation strategies (e.g., top-down versus participatory approaches) influence emotional exhaustion and overall job satisfaction would be valuable. Studies could also explore how AI systems integrated into different job roles or organizational levels impact employees' work experiences and performance outcomes. Finally, developing interventions to enhance job crafting and technological self-efficacy is crucial. Future research could focus on designing and testing targeted interventions, such as workshops or training programs, aimed at increasing employees' ability to craft their jobs and build confidence in using AI technologies. Evaluating the effectiveness of such interventions in reducing emotional exhaustion and improving job performance would provide practical insights for hotel management and other organizations seeking to support their employees through AI transitions.

Acknowledgment

This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [KFU250069].

Conflict of interest

The authors declare no conflict of interest.

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Appendix (A): detailed measurement scales

AI awareness (AIA)

AIA.1. Given that AI is being widely used workplace, I will concern about my future in this industry.
AIA.2. Given that AI is being widely used workplace, I will concern about my future in the organization.
AIA.3. I think there is a possibility that my current job will be replaced by AI.
AIA.4. I think AI might replace our jobs.

Emotional Exhaustion (EEX)

EEX.1. I feel emotionally drained from my work
EEX .2. I feel used up at the end of the workday
EEX .3. I feel fatigued when I get up in the morning and have to face another day on the job
EEX .4. Working with people all day is really a strain for me
EEX .5. I feel burned out from my work
EEX .6. I feel frustrated by my job
EEX .7. I feel I am working too hard on my job
EEX .8. I feel like I am at the end of my rope.

Job Crafting (JC)

JC.1. Introduce new approaches on your own to improve your work in the job.
JC.2. Change minor work procedures that you think are not productive on your own.
JC.3 On your own, change the way you do your job to make it easier to yourself.
JC.4 Rearrange equipment or furniture in the play areas of your classroom on your own.
JC.5. Organize special events in your job on your own.
JC.6. On your own, bring in other materials from home for the job.
JC.7. Work together with your coworkers to introduce new approaches to improve your work in the job.
JC.8. Decide together with your coworkers to change the way you do your job to make it easier to yourself.
JC.9. Decide together with your coworkers to rearrange equipment or furniture in the play areas of your job.
JC.10. Decide together with your coworkers to organize special events in your job.

Technology self-efficacy (TSE)

TSE.1. When I have to learn a new task that is high tech, my first reaction is that I'm sure I can do it.
TSE.2. In terms of my ability to learn new tasks that are high tech, I would describe myself as one of the best in my work group.
TSE.3. In the past, I have had a great amount of experience (either on or off the job) working on high-tech tasks.
TSE.4. I am extremely confident that I can learn to use AI technology on my job.
TSE.5. AI technology will allow me to perform my job better and more efficiently.

Appendix (B): Model fit and quality indices

	Assessment	Criterion	Decision
Average path coefficient (APC)	0.403, P<0.001	P<0.05	Supported
Average R-squared (ARS)	0.514, P<0.001	P<0.05	Supported
Average adjusted R-squared (AARS)	0.510, P<0.001	P<0.05	Supported
Average block VIF (AVIF)	3.099	Acceptable if = 5, ideally = 3.3	Supported
Average full collinearity VIF (AFVIF)	1.553	Acceptable if = 5, ideally = 3.3	Supported
Tenenhaus GoF (GoF)	0.601	Small = 0.1, medium = 0.25, large = 0.36	Supported
Sympson's paradox ratio (SPR)	1.000	Acceptable if = 0.7, ideally = 1	Supported
R-squared contribution ratio (RSCR)	1.000	Acceptable if = 0.9, ideally = 1	Supported
Statistical suppression ratio (SSR)	1.000	Acceptable if = 0.7	Supported
Nonlinear bivariate causality direction ratio (NLBCDR)	0.933	Acceptable if = 0.7	Supported