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Challenge and hindrance appraisals of smart technology, artificial intelligence, robotics and algorithms (STARA) awareness and job performance: The moderating role of work-life balance

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ABSTRACT

This study examines hotel employees' perceptions of smart technology, artificial intelligence, robotics and algorithms (STARA) awareness regarding challenges and hindrances as well as analyzing how these perceptions influence their job performance. It also investigates the role of work-life balance as a moderating factor in the relationship between STARA awareness as a stressor with job performance. A quantitative research approach was employed, with data collected online and from face-to-face questionnaires. The study targeted employees from 5-star hotels in Jakarta who have had at least two years of experience working with technology and hold permanent or contract positions (excluding daily or part-time workers). A total of 400 respondents participated. The findings indicate that viewing STARA awareness as a challenge positively influences job performance, while perceiving it as a hindrance has no significant effect. Moreover, work-life balance was found to impact job performance. Future research could extend these findings by comparing international and local hotels and incorporating additional variables such as technological competence, organizational support and work involvement.

KEYWORDS

challenge-hindrance, hotel industry, job performance, STARA awareness, work-life balance

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1. Introduction

The hotel industry has shown strong expansion over time, making it one of the fastest growing and largest sectors globally (Presenza et al., 2019, p. 1). The industry has changed a lot in the last few years because more people are using new technologies faster (Kansakar et al., 2019), because of constant innovation and a business climate that is becoming more dynamic (Hsu & Tseng, 2022). Smart technology, artificial intelligence, robotics and algorithms (STARA) are examples of this change Brougham & Haar, 2018). They are changing the way services are delivered and are helping to achieve larger sustainability goals that are in line with Sustainable Development Goals (United Nations General Assembly, 2015). Even if STARA technologies are expected to take away a lot of jobs, especially in industries that rely heavily on services, the hotel industry still relies on interactions between people, which makes full automation impossible (Parvez et al., 2022).

The integration of STARA technologies offers substantial advantages (Lestari et al., 2023), including enhanced operational efficiency (Balatska et al., 2022), increased productivity (Huang & Rust, 2018), and reduced labor costs (Ivkov et al., 2020; Naik & Daptardar, 2019). However, it concurrently presents significant human resource challenges. Previous research has recorded elevated work stress (Fernández-Batanero et al., 2021), increased job insecurity (Lingmont & Alexiou, 2020), employee fatigue (Kong et al., 2021), and possible reductions in job performance linked to technology-induced change (Choi et al., 2020). The diverse outcomes suggest that STARA's impact on employees is variable and depends on how technological demands are interpreted and handled at both individual and organizational levels.

Employees are a vital strategic resource and a significant reason why the hospitality industry is so competitive (Ghani et al., 2022; Tahiri et al., 2022). Hotel personnel often encounter several stressors, such as unstable job conditions, extended working hours, inadequate wages and a continual work-life imbalance (Bhaswani & Hymavathi, 2022), which may be exacerbated by continuous technological advancements (Tuan, 2022). Current research on stress underscores that occupational stress should not be regarded as intrinsically harmful; instead, its effects depend on employees' cognitive evaluations, which interpret stressors as either opportunities for development or obstacles to achieving objectives (Akkuş & Arslan, 2023; Bolm et al., 2022; Tsui, 2021). Applying this distinction to STARA awareness helps clarify why analogous technological situations may yield divergent performance outcomes among employees.

While research has increasingly focused on STARA awareness and technology-induced stress, most studies examine these concerns in isolation. Numerous studies investigate the impact of STARA awareness or utilize the challenge-hindrance evaluation framework for general job stressors; however, they often neglect to address STARA-related perceptions within this framework. Moreover, work-life balance is widely seen as a crucial human resource management strategy for enhancing employee well-being and productivity (Irawanto et al., 2021; Putra Edy Wirawan, 2022). Prior studies primarily regard work-life balance as a direct determinant of performance rather than as a contextual factor that influences how employees cognitively interpret technology-related stressors, such as heightened workload, indistinct work-life boundaries or perceived job insecurity, into performance outcomes. Accordingly, it remains unclear whether work-life balance merely enhances performance or also alters the strength of the relationship between STARA-related stress appraisals and job performance. As a result, little is known about when and under what conditions STARA awareness enhances or undermines job performance in the hospitality context.

Additionally, theoretical uncertainty persists regarding the importance of work-life balance for STARA awareness, particularly its impact on performance enhancement and on the interpretation of technological stress evaluations in relation to work outcomes. STARA-related challenges, such as heightened workload, continuous monitoring or perceived job instability, may compromise employees' ability to keep clear boundaries between professional and personal life in technology-driven contexts. In this way, work-life balance is a reflection of both an individual's condition and the efficiency of organizational procedures that allow workers to handle increased technological demands (Prastita et al., 2025).

In the hotel industry, employee performance is a key factor in business success, as it directly affects service quality, customer satisfaction and operational effectiveness (Alomran et al., 2022; Ni et al., 2022). Previous studies have delineated various antecedents of performance in hospitality environments, encompassing emotional exhaustion (Hori & Chao, 2022), motivation and incentives (Seng & Arumugam, 2017), perceptions and adoption of technology (Bangun et al., 2021; Baskaran et al., 2020), and work-life balance (Faisal et al., 2022). Among these elements, work-life balance has become a particularly prominent human resource management (HRM) mechanism, especially in environments marked by extended working hours and blurred work-family boundaries, such as the hotel industry (Arumdani & Churiyah, 2022; Besagas & Branzuela, 2023). Empirical research indicates that work-life balance not only alleviates stress but also enhances employee performance (Mufida Ahmad et al., 2022; Susanto et al., 2022). Its effectiveness

may vary depending on the nature of the stressors employees face.

To address existing gaps, this study takes a fresh approach by integrating STARA awareness, the challenge–hindrance appraisal theory, and work-life balance into a clear framework. Here, STARA awareness is seen as a technology-related source of stress that hotel employees might view as either a challenge or a hindrance. Rather than assuming that work-life balance generically buffers all forms of technology stress, this study frames work-life balance as a border condition that may variably influence the performance consequences of challenge and hindrance appraisals. It examines hotel employees' perceptions of STARA awareness regarding challenges and hindrances and analyzes how these perceptions influence their job performance while investigating the role of work-life balance as a moderating factor in the relationship between STARA awareness as a stressor and job performance. This underscores the significant role of work-life balance in shaping the effects of these stressors and the approach reframes STARA awareness from a uniform threat to a more nuanced understanding of how hotel employees' performance is influenced by their work-life balance.

The findings have significant implications for hotel managers, indicating that initiatives aimed at achieving work-life balance and supportive human resource management practices should enhance, rather than replace, efforts to mitigate technology-related hindrance stressors, including job insecurity and excessive workload.

2. Literature review

2.1. Smart technology, artificial intelligence, robotics and algorithm (STARA) awareness

Many people thought that smart technology, artificial intelligence, robotics and algorithms (STARA) would change the workforce. Some estimates say that up to one-third of current jobs will be affected in the future (Rane & Bhosale, 2023). STARA awareness refers to employees' perceptions and understanding of the extent to which these technologies might replace or alter their existing job functions (Brougham & Haar, 2018). With the rapid pace of technological progress, apprehensions surrounding job security, career stability and the pertinence of skills have emerged as prominent issues for the workforce (Tan et al., 2023).

The implementation of STARA signifies a profound transformation in work dynamics and organizational frameworks, introducing uncertainty and potential risks for many employees (Zhang & Jin, 2023). While technology adoption is linked to enhanced efficiency and productivity, it may concurrently heighten job demands and psychological strain (Fernández-Batanero et al., 2021). Previous research has established a connection between technology-induced transformations and heightened job-related stress, along with negative implications for employee well-being and performance (Choi et al., 2020). These mixed findings suggest that STARA awareness does not uniformly affect employees but rather depends on how individuals perceive and interpret the technological changes they face.

Thus, understanding employees' psychological reactions to STARA awareness is essential for elucidating the diversity of work-related outcomes and for formulating appropriate human resource strategies amid the digital transition.

2.2. Challenge-hindrance appraisal toward smart technology, artificial intelligence, robotics and algorithm (STARA) awareness

Job stress occurs when a person's job responsibilities are too much to handle, either physically or mentally (Tsui, 2021). Due to rapid technological advances, awareness of STARA has become a notable contributor to workplace stress (Ding, 2021) and research on stress indicates that the effects of stressors depend on individuals' cognitive appraisals rather than the stressors themselves.

According to the transactional theory of stress, stress depends on an individual's cognitive appraisal of a situation, particularly whether it is perceived as a challenge or a threat, which in turn shapes the stress experience (Lazarus & Folkman, 1984). Recent research has applied and extended this framework to modern work contexts, showing the interplay between challenge–hindrance appraisal and individual outcomes such as performance in remote work settings (Schoch, 2023). Challenge appraisals arise when individuals perceive difficult conditions as opportunities for learning, growth or success. At the same time, hindrance evaluations occur when situations are viewed as barriers to goal achievement or threats to job security (Ding, 2022).

Within the STARA framework, these two appraisals are highly relevant. Employees who perceive technological advancements as challenges often appreciate the positive aspects of technology, including increased efficiency, improved work processes, and opportunities for personal growth, particularly when supported by a supportive work environment and access to technology training (Bhargava et al., 2021; Schoch, 2023). The implementation of robotics and artificial intelligence automates repetitive tasks, enabling employees to focus on higher-value or more significant activities (Mabungela, 2023). Such positive

interpretations suggest that challenge appraisals of STARA awareness may facilitate adaptive behaviors and enhance job performance.

On the other hand, employees who see STARA awareness as a problem tend to feel stressed because they are unsure about their job security and feel as if their talents are not needed or can be replaced (Mazzola & Disselhorst, 2019). In such circumstances, STARA awareness may impose a psychological burden, leading to anxiety or disengagement. Moreover, a comprehensive understanding of STARA as an adaptive mechanism indicates that individuals proficient in technology are more inclined to address their anxieties through upskilling and career advancement proactively (Li et al., 2021). This shows that higher evaluations of STARA awareness are likely to be connected with less favorable performance outcomes, but the extent of this association may differ among situations.

Drawing on stress appraisal theory and prior empirical findings, STARA awareness may be cognitively appraised by employees as a challenge or a hindrance, leading to different performance outcomes. Accordingly, the following hypotheses are proposed:

H_1: Challenge appraisal toward STARA awareness affects job performance.

H_2: Hindrance appraisal toward STARA awareness affects job performance.

2.3. Work-life balance

Work-life balance is the ability to manage and meet obligations in both work and non-work areas while still being happy and healthy in both (George & Sreedharan, 2023). This balance indicates the extent of alignment among work demands, family responsibilities and personal activities, including leisure, social interactions and self-care (Kerdpitak & Jermsittiparsert, 2020). In modern employment settings, especially in service sectors, work-life balance has become a significant factor for job seekers, reflecting a transition from a solely financial focus to a more comprehensive assessment of job quality (Hoang et al., 2020). Organisations are increasingly tasked with designing work-life balance initiatives that are congruent with their culture and values, and that receive institutional support to guarantee their effectiveness (Fotiadis et al., 2019).

From an employee well-being perspective, the capacity to uphold distinct boundaries between professional and personal life correlates with diminished stress, a lower likelihood of burnout, and enhanced psychological health, all of which foster sustained work engagement and productivity (Cabaraban & Borbon, 2021). Empirical evidence indicates that work-life balance positively affects job satisfaction and overall job performance, especially in occupations with significant emotional and temporal demands, such as the hospitality sector (Dewi et al., 2021). Work-life balance is an essential resource in human resource management that enhances employees' ability to manage workplace stressors.

In technology-driven workplaces, achieving work-life balance is increasingly complex. The implementation of STARA has the potential to elevate workloads, expedite tasks, and blur the boundaries between professional and personal life. Work-life balance supports time management and recovery from job demands; however, its effectiveness in mitigating technology-related stress depends on employees' perceptions of these stressors. The challenge–hindrance appraisal theory posits that challenge-related stressors from STARA, including opportunities for skill development or efficiency enhancement, are more manageable for employees who maintain a robust work-life balance. This study indicates that work-life balance equips individuals with the necessary time and mental resources to transform challenges into enhanced job performance (Adya & Desiana, 2025; Tan et al., 2023).

Conversely, hindrance stressors linked to STARA, such as job insecurity, diminished autonomy and fears of technological replacement, pose significant threats to employees' job stability and career continuity. These stressors frequently extend beyond work and family dynamics and may not be adequately addressed through work-life balance strategies alone. Consequently, work-life balance may mitigate stress when employees perceive STARA as a hindrance instead of a challenge. This indicates that although work-life balance may alleviate stress, its effectiveness depends on employees' perceptions of the stress they encounter (Santhanam et al., 2021).

Furthermore, as work-life balance represents a vital personal and organizational resource, it may influence how employees translate STARA-related stress appraisals into performance outcomes. Therefore, the following hypotheses are proposed.

H_3: Work-life balance affects job performance.

H_4: Work-life balance moderates the relationship between challenge appraisal toward STARA awareness and job performance.

H_5: Work-life balance moderates the relationship between hindrance appraisal toward STARA awareness and job performance.

2.4. Job performance

Job performance can be defined as how an individual's actions, behaviours and abilities contribute to achieving organizational goals (Ni et al., 2022). In the hospitality industry, where direct interactions between employees and guests significantly determine the guest experience, employee performance is crucial for a hotel's operational success and competitiveness (Dorta-Afonso et al.,

2021). Therefore, improving employee performance is a strategic priority, especially amidst the industry's evolving challenges.

Implementing technology in the workplace has been shown to improve performance through task automation, reduced human error, and increased operational efficiency (Baskaran et al., 2020). However, employee responses to technology are not always uniform. Based on a stress assessment approach, previous research has shown that stress resulting from challenges perceived as opportunities for growth is positively correlated with improved performance (Xu et al., 2024). Conversely, stress resulting from obstacles perceived as disruptive or threatening negatively correlates with performance (Deng et al., 2019).

In addition to technology and work stress, work-life balance has been shown to significantly impact performance (Cai et al., 2022). When employees feel they have sufficient time and energy to meet the demands of their professional and personal lives, they tend to perform at their best (Borgia et al., 2022). Thus, achieving the best possible employee performance requires a comprehensive strategy that emphasizes not only technology and productivity but also each employee's mental health and work-life balance.

Based on the literature review above, this study argues that STARA awareness, which is divided into challenge and hindrance stress, influences work performance. Furthermore, this study proposes that work-life balance can mitigate or strengthen the relationship between STARA Awareness and work performance. The research framework is presented in Figure 1.

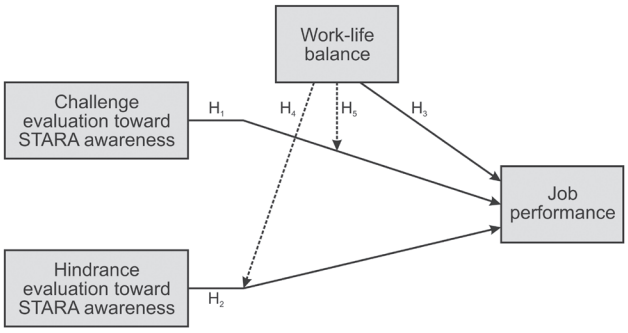

Figure 1. Conceptual framework
Source: authors

3. Methodology

3.1. Sample and data collection

This research uses quantitative methods, and data collection is conducted through online and in-person questionnaires. The population consists of employees of 5-star hotels in Jakarta with a minimum length of service of two years, who work in the technology field and are contract or permanent employees, not daily or part-time workers. After sorting the 415 respondents who completed the questionnaire according to the stated criteria, 400 respondents were gathered. The minimum number of samples that must be collected is 5–10 times the number of indicators (Hair et al., 2017), so the minimum sample for this research is 160 or 320. By obtaining a total of 400, a large sample size will increase the partial least squares structural equation modeling (PLS-SEM) estimates' precision (i.e., consistency) (Hair et al., 2021).

3.2. Variable measurement

The data in this study were collected through a questionnaire survey. The measurement instrument was constructed based on several relevant studies published in reputable international journals concerning information technology, information systems and business management. It was carefully translated from English to Indonesian, and other academics collaborated with it to ensure terminological accuracy and cultural contextual appropriateness.

The STARA awareness measure, conceptualized as a stressor categorized into challenge and hindrance dimensions, was adapted from (Tan et al., 2023). Eight items were used to measure perceptions of challenges, and eight to measure perceptions of barriers. Meanwhile, the work-life balance measure consisted of ten items adapted and adopted from Susanto et al. (2022). The job performance measure included six items adapted and adopted from an instrument developed by Han et al. (2022).

4. Findings

4.1. Respondent profile

The data in this study were collected from 400 participants who met the inclusion criteria: 5-star hotel employees, having worked for at least two years, being either permanent or contract employees, and engaging in a field that utilizes technology in daily operations. The characteristics of respondents can be seen in Table 1.

Table 1. Respondents characteristics

Characteristic	Category	Frequency (*n*)	Percentage (%)
Gender	Male	230	57.50
	Female	170	42.50

Table 1 (cont.)

Characteristic	Category	Frequency (*n*)	Percentage (%)
Age	20–30 years	110	27.50
	31–40 years	105	26.25
	41–50 years	100	25.00
	Above 50	85	21.25
Educational background	Senior high school	28	7.00
	Vocational high school	118	31.00
	Diploma 3 (D3 – general)	45	11.00
	Diploma (D3/D4 – tourism or hospitality)	144	35.00
	Bachelor degree (S1 – general)	47	12.00
	Above a bachelor degree	18	4.00
Employment status	Permanent employee	129	32.25
	Contract employee	271	67.75
Length of employment	≥2 years	400	100.00

Source: authors.

4.2. Measurement model

Data processing in this study was conducted using SmartPLS software, with the initial stage including testing the validity and reliability of the measurement instruments. Construct validity was determined based on factor loading values >0.70 and average variance extracted (AVE) values >0.50. In contrast, construct reliability was assessed using composite reliability and Cronbach's alpha, both expected to exceed 0.70, as recommended in the quantitative methodology literature (Hair et al., 2017).

The test results presented in Table 2 indicate that all indicators had factor loadings above the minimum threshold of 0.70, and all constructs demonstrated adequate AVEs, namely greater than 0.50. Furthermore, the composite reliability and Cronbach's alpha values for each construct also exceeded the minimum required value, indicating a high level of internal consistency.

Thus, all instruments used in this study were valid, reliable and suitable for further structural model testing.

Furthermore, the Fornell-Larcker criterion is required to assess discriminant validity. It assesses discriminant validity by comparing each construct's square root of the AVE with the correlations among other constructs. Discriminant validity is declared fulfilled if the square root of the AVE is higher than the correlation with other constructs, indicating that each construct measures a distinctly different concept. Applying this criterion ensures the clarity of the model's constructs, making the analysis results more accurate and credible. The processing results can be seen in Table 3.

Table 2. The measurement model's reliability

Variable	Items	Loading	Cronbach's alpha	Composite reliability (*CR*)*	Average variance extracted (AVE)**
Challenge appraisal toward STARA awareness	X1.1	0.889	0.940	0.951	0.706
	X1.2	0.794			
	X1.3	0.809			
	X1.4	0.845			
	X1.5	0.820			
	X1.6	0.886			
	X1.7	0.835			
	X1.8	0.841			
Hindrance appraisal toward STARA awareness	X2.1	0.874	0.942	0.951	0.709
	X2.2	0.872			
	X2.3	0.873			
	X2.4	0.848			
	X2.5	0.743			
	X2.6	0.844			
	X2.7	0.832			
	X2.8	0.843			
Work-life balance	Z1	0.840	0.960	0.965	0.736
	Z2	0.863			
	Z3	0.868			
	Z4	0.858			
	Z5	0.840			
	Z6	0.870			
	Z7	0.872			
	Z8	0.859			
	Z9	0.843			
	Z10	0.865			
Job performance	Y1	0.800	0.914	0.933	0.700
	Y2	0.850			
	Y3	0.840			
	Y4	0.864			
	Y5	0.856			
	Y6	0.809			

Source: authors.

Table 3. Fornell-Larcker criterion

Variables	Challenge stressor (X1)	Hindrance stressor (X2)	Job performance (Y)	Moderating effect 1	Moderating effect 2	Work-life balance (Z)
Challenge stressor (X1)	**0.841**	–	–	–	–	–
Hindrance stressor (X2)	0.339	**0.842**	–	–	–	–
Job performance (Y)	0.515	0.254	**0.837**	–	–	–
Moderating effect 1	–0.265	–0.154	–0.309	**1.000**	–	–
Moderating effect 2	–0.188	–0.065	–0.142	0.483	**1.000**	–
Work-life balance (Z)	0.574	0.344	0.739	–0.342	–0.282	**0.858**

Source: authors.

The data from Table 3 show the results of the discriminant validity test using the Fornell-Larcker criterion, indicating that the square root of the AVE for each construct is higher than the correlations among the other constructs. The square root of the AVE values for challenge stressor (0.841), hindrance stressor (0.842), job performance (0.837), moderating effect 1 (1.000), moderating effect 2 (1.000), and work-life balance (0.858) consistently exceed the highest correlation values with other constructs in the same row/column. The results indicate that each construct in the model measures a distinct concept, thereby meeting the discriminant validity criteria.

Afterward, the data were processed to calculate the coefficient of determination (R^2), which indicated that the proposed structural model accounted for most of the variance in job performance. According to the structural model results, job performance has an adjusted R^2 of 0.568 and an R^2 value of 0.573. This suggests that 57.3% of the variation in employee job performance may be explained by assessments of work-life balance, challenge, and hindrance related to STARA awareness, as well as their interaction effects. These results imply that the proposed model has sufficient explanatory power for hotel-sector performance outcomes.

4.3. Hypothesis test

The next step was hypothesis testing, which used the PLS-SEM approach in this study and was processed using SmartPLS software. This analysis focused on three main indicators: the path coefficient to determine the direction and strength of the relationship between variables, the *t*-statistic to test the significance of the relationship, and the *p*-value to determine the probability of error in statistical decision-making.

This test accepts the hypothesis if the *t*-statistic exceeds 1.96 (at a 5% significance level) and the *p*-value is less than 0.05. This approach allows for a more comprehensive evaluation of direct, indirect and moderating relationships within the research model, resulting in a more accurate interpretation of the results and their relevance to the research objectives. The following are the results of the hypothesis test in Table 4.

The results of the hypothesis test using PLS-SEM analysis show that challenge stressor (X1) has a positive and significant effect on job performance (Y) with a path coefficient of 0.135, a *t*-statistic of 2.735, and a *p*-value of 0.006 (<0.05). This indicates that employees' work challenges can significantly improve their performance, thereby supporting hypothesis one.

Table 4 . Hypothesis testing result

Hypothesis	Structural path	Original sample (*O*)	*t*-value	*p*-values	Result
H_1	Challenge appraisal toward STARA awareness affects job performance	0.135	2.735	0.006	Supported
H_2	Hindrance appraisal toward STARA awareness affects job performance	–0.031	0.845	0.399	Not supported
H_3	Work-life balance affects job performance	0.670	12.551	0.000	Supported
H_4	Work-life balance moderates the relationship between challenge appraisal toward STARA awareness and job performance	–0.074	2.097	0.036	Supported
H_5	Work-life balance moderates the relationship between hindrance appraisal toward STARA awareness and job performance	0.103	2.528	0.012	Supported

Source: authors.

Conversely, hindrance stressor (X2) shows a negative but insignificant effect on job performance (Y), with a coefficient of –0.031, a *t*-statistic of 0.845, and a *p*-value of 0.399 (>0.05), so the data do not support the hypothesis that work obstacles affect employee performance. Based on these results, hypothesis two is rejected. Furthermore, work-life balance (Z) was shown to have a positive and significant effect on job performance (Y) with a coefficient of 0.670, a *t*-statistic of 12.551, and a *p*-value of 0.000, indicating that work-life balance is an important factor in driving optimal performance. Based on this, hypothesis three was accepted.

In the moderation effect test, moderating effect 1 had a negative but significant effect on job performance (Y) with a coefficient of –0.074, a *t*-statistic of 2.097, and a *p*-value of 0.036 (<0.05), indicating that this variable weakens the tested relationship. Conversely, moderating effect 2 had a positive and significant effect on job performance (Y) with a coefficient of 0.103, a *t*-statistic of 2.528, and a *p*-value of 0.012 (<0.05), indicating that this variable strengthens the tested relationship. Hypotheses 4 and 5 were accepted based on the results.

Overall, these results support most of the research hypotheses and confirm the dominant role of work-life balance in influencing performance, rather than the inhibiting effects of work-stress factors. These results support most of the research hypotheses and confirm the dominant role of work-life balance in influencing performance rather than in mitigating work stressors.

5. Discussion

This study examines hotel employees' opinions of STARA as challenges or hindrances and evaluates the influence of these perceptions on job performance. It employs stress appraisal theory and work-life balance frameworks to clarify STARA-related stress, employees' evaluations of these challenges, and their boundary management strategies within human resource management.

The findings indicate that challenge appraisal of STARA awareness has a significant positive effect on job performance. A result consistent with prior research suggesting that when employees perceive technological change as an opportunity for learning, skill development, and career advancement, they are more likely to demonstrate higher motivation and performance (Bhargava et al., 2021; Li et al., 2021; Schoch, 2023). Compared to previous studies on digital stressors, this finding reinforces the argument that challenge-oriented interpretations of STARA can activate adaptive behaviors rather than resistance, particularly in service-based industries such as hospitality.

In contrast, hindrance appraisal of STARA awareness was found to have a negative but statistically insignificant effect on job performance. While some studies have reported a significant negative relationship between hindrance stressors and performance (Deng et al., 2019; Mazzola & Disselhorst, 2019), the present findings suggest that perceived job insecurity or workload associated with STARA does not necessarily translate into immediate performance deterioration. This divergence may reflect the hospitality context, where human interaction and service delivery norms may temporarily sustain performance despite underlying stress.

The work also confirms a strong positive relationship between work-life balance and job performance, consistent with previous findings (Cabaraban & Borbon, 2021; Dewi et al., 2021; Fotiadis et al., 2019). This supports the broader human resources management literature, which emphasizes work-life balance as a critical personal resource that enhances employee energy, engagement and sustained performance.

More importantly, this study demonstrates that work-life balance moderates the relationship between STARA-related stress appraisals and job performance. Consistent with Santhanam et al. (2021), work-life balance strengthens the positive effect of challenge appraisal by enabling employees to allocate personal resources more effectively when facing technological demands.

The results show that work-life balance is not a universal way to protect against all types of STARA-related stress, especially those that come from job uncertainty and a heavier workload. Although work-life balance can help people cope with challenge-related stress, it is insufficient to mitigate hindrance stressors that jeopardise job stability. This distinction emphasises that work-life balance functions as a contextual resource, influencing how employees convert STARA-related evaluations into performance results, rather than serving as an independent protective factor.

From a managerial standpoint, these data indicate that relying solely on individuals' work-life balance is unlikely to comprehensively mitigate the stress associated with the digital transition. Human resource managers should thus acknowledge STARA technologies as both efficiency-enhancing instruments and potential sources of psychological stress. Consequently, work-life balance initiatives, such as flexible scheduling, wellness support and equitable leave policies, must be complemented by targeted training, reskilling programmes, and clear communication to mitigate uncertainty and perceived job instability.

The research possesses multiple limitations. The data were gathered from a single industry environment, which may have constrained generalizability. Subsequent

research may enhance this paradigm by integrating organizational-level resources, such as work-life balance-supportive practices, technical proficiency or perceived organizational support, as alternative boundary conditions. Cross-cultural studies would yield profound insights into employee responses to STARA-related stress across various institutional contexts.

This study enhances the literature by illustrating that employees' challenge and hindrance perceptions of STARA awareness have unique effects on job performance, and that the influence of work-life balance is conditional rather than absolute. It enhances comprehension of employee adaptation to digital transformation in the hotel industry by delineating the parameters of work-life balance as a contextual resource.

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