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Mitigating the Impact of Cyberloafing on Employee Performance in the Hospitality and Tourism Industry: Roles of Human-AI Collaboration and Mindfulness

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ABSTRACT

Guided by the job demands-resources (JD-R) model, this study sought to investigate the impact of cyberloafing behaviors on employees' job performance. Furthermore, it explored the moderating influence of human-AI collaboration and employee mindfulness on this relationship. Data were collected from a sample of 311 reservation employees working within category A travel agencies and five-star hotels in Egypt. Employing a quantitative research design, structural equation modeling (SEM-PLS) was utilized via WarpPLS v.7 to analyze the collected data. The findings revealed a significant negative impact of cyberloafing behaviors on employee job performance. Moreover, the study confirmed the moderating roles of human-AI collaboration and mindfulness, demonstrating their ability to lessen the adverse effects of employee cyberloafing on their job performance. This research contributes to the existing body of literature by providing empirical evidence of the potential negative consequences of cyberloafing on employee performance, specifically within the hospitality and tourism sector. It also offers valuable insights for organizations considering the adoption of human-AI collaboration and mindfulness as mechanisms to mitigate the detrimental effects of cyberloafing behaviors on employee performance.

KEYWORDS

Cyberloafing, job performance, human-AI collaboration, mindfulness, hotels, travel agencies.

التخفيف من تأثير التسكع الإلكترونى على أداء الموظفين في قطاع الضيافة والسياحة: أدوار التعاون بين البشر والذكاء الإصطناعى واليقظة الذهنية

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الملخص

استرشادًا بنموذج متطلبات الوظيفة والموارد (JD-R)، سعت هذه الدراسة إلى التحقيق في تأثير سلوكيات التسكع الإلكتروني على أداء الموظفين الوظيفي. وعلاوة على ذلك، استكشفت التأثير المعدل للتعاون بين البشر والذكاء الاصطناعي واليقظة الذهنية على هذه العلاقة. تم جمع البيانات من عينة من 311 موظفًا في مجال الحجز يعملون في وكالات سفر من الفئة أ وفنادق خمس نجوم في مصر. وباستخدام تصميم بحث كمي، تم استخدام نمذجة المعادلات الهيكلية (SEM-PLS) عبر WarpPLS v.7 لتحليل البيانات المجمعة. كشفت النتائج عن تأثير سلبي كبير لسلوكيات التسكع الإلكتروني على أداء الموظفين الوظيفي. علاوة على ذلك، أكدت الدراسة الأدوار المُعدلة للتعاون بين البشر والذكاء الاصطناعي واليقظة الذهنية، مُظهرةً قدرتها على تخفيف الآثار السلبية لسلوكيات التسكع الإلكتروني على أداء الموظفين. يُسهم هذا البحث في مجموعة الدراسات الحالية من خلال تقديم أدلة تجريبية على العواقب السلبية المحتملة للتسكع الإلكتروني على أداء الموظفين، وخاصةً في قطاع الضيافة والسياحة. كما يُقدم رؤى قيّمة للمؤسسات التي تُفكر في اعتماد التعاون بين البشر والذكاء الاصطناعي واليقظة الذهنية كآليات للتخفيف من الآثار السلبية لسلوكيات التسكع الإلكتروني على أداء الموظفين.

الكلمات الدالة

التسكع الإلكترونى، الأداء الوظيفى، التعاون بين البشر والذكاء الإصطناعى، اليقظة الذهنية، الفنادق، وكالات السفر.

Introduction

For contemporary organizations, especially those in service-focused sectors like hospitality and tourism, internet resources have become indispensable for their operations efficiency (Magdy & Hassan, 2025). The effective deployment of internet resources can yield several beneficial outcomes, including decreased operational expenditures, enhanced communication among personnel, and improved work performance (Lin et al., 2025). While the intended function of the internet is to serve as a tool for enhancing employees' job performance (Qian & Jiang, 2024), it can also be diverted into a medium for non-productive activities (Lai et al., 2025). That is, has also inadvertently facilitated opportunities for employees to engage in non-work-related online activities, a behavior commonly known as cyberloafing (Uslu, 2025). Cyberloafing can be conceptualized as a range of behaviors exhibited by employees in the workplace, involving electronically-mediated activities, notably via internet usage, which their direct supervisors would deem unrelated to their professional responsibilities (Bagis et al., 2024). These cyberloafing activities encompass a variety of actions such as accessing non-work-related websites, engaging with social media platforms (e.g., Facebook, Instagram, and TikTok), viewing online video content, and participating in online gaming, among others (Yildiz & Yildiz, 2025).

Cyberloafing represents a significant managerial challenge, evidenced by reports indicating that employees dedicate an average of 3 hours and 12 minutes of their workday to online activities unrelated to their job responsibilities (Restubog et al., 2011). Another study suggested that employees may spend approximately 5 hours daily on non-work-related online engagement (Lim & Chen, 2012). Kim et al. (2016) found that roughly 55% of hospitality employees reported engaging in cyberloafing during their shifts, primarily as a means to alleviate stress or boredom during periods of inactivity. Estimates suggest that employees may dedicate approximately 10% to 30% of their working hours, equating to 1 to 2 hours per workday, to cyberloafing (Agarwal, 2019). Notably, employees may not always recognize the detrimental impact of these activities on their productivity and overall job performance (Sao et al., 2020). More recent studies have suggested that employees may spend between 40% and 60% of their allocated work time on activities disconnected from their job tasks (Lim et al., 2021). In the Egyptian context, where the tourism and hospitality industry is crucial to the national economy, cyberloafing is a particularly concerning phenomenon. According to Magdy and Hassan (2025), a substantial proportion of employees (67.23%) spend between 2 and 3 hours daily on online activities, highlighting the significant integration of social media into daily routines.

In response to the challenges posed by cyberloafing, organizations have implemented various strategies, including the establishment of internet usage policies, the deployment of internet monitoring and filtering systems, and the imposition of disciplinary measures (Mkhize et al., 2024). The primary rationale behind these efforts to curb cyberloafing stems from the assumption that such behavior negatively impacts work performance by diverting employees' time, energy, and focus from their designated tasks (Kularathne & Senevirathne, 2021; Kamila & Muafi, 2023; Karyatun et al., 2023). However, a counter-argument exists within academic discourse, suggesting that cyberloafing can function as a form of work diversion that may

stimulate creativity, foster the generation of novel ideas, mitigate job-related stress, and facilitate mental recuperation, ultimately leading to potential enhancements in both creativity and job performance (Rahman et al., 2022; Zhong et al., 2022; Farid et al., 2024; Kwala & Agoyi, 2025). Conversely, other empirical studies have indicated a negligible impact of cyberloafing on employee job performance (Hafizh & Sumadhinata, 2022; Rahmawati et al., 2024).

The body of academic research investigating the impact of cyberloafing on work performance presents mixed findings. Nevertheless, there remains a necessity for more nuanced research to delineate the specific factors that moderate this relationship, particularly within the dynamic context of the hospitality and tourism industry. The present study addresses a significant research gap by exploring factors that influence the negative impact of cyberloafing on employee job performance within this specific industry. Specifically, this research aims to analyze how artificial intelligence collaboration and mindfulness moderate the impact of cyberloafing on employee job performance. Thus, the novelty of this study lies in its focus on these moderating factors within the hospitality and tourism sector, offering a valuable contribution to the understanding of the complexities inherent in this evolving work environment.

Theoretical Framework and Hypotheses

The Job Demands-Resources (JD-R) Model

The JD-R model, initially conceptualized by Demerouti et al. (2001), offers a foundational framework for understanding the influence of workplace conditions on employee job performance. According to the JD-R model, all aspects of work can be categorized into two overarching dimensions: job demands and job resources. Job demands encompass the physical, psychological, social, or organizational elements of a job that necessitate sustained employee effort, potentially leading to diminished job performance (Demerouti & Bakker, 2023). Conversely, job resources represent the supportive psychological, social, or organizational factors present in the work environment, including elements such as social support, human-AI collaboration, and workplace mindfulness (Wu et al., 2024). Within the JD-R perspective, the experience of excessive job demands may precipitate employee engagement in cyberloafing as a coping mechanism to manage these high demands or a perceived deficiency in job resources, like access to AI collaboration and mindfulness practices. Such cyberloafing behaviors can negatively impact overall employee performance (Huang et al., 2022; Kwala & Agoyi, 2025). Therefore, this study adopts the JD-R theory to posit cyberloafing as a job demand that adversely affects job performance. Furthermore, it proposes that human-AI collaboration and mindfulness serve as critical job resources capable of moderating the detrimental impact of cyberloafing on job performance. Specifically, this research hypothesizes a moderating model wherein human-AI collaboration and mindfulness moderate the relationship between cyberloafing and job performance. The conceptual framework of this study is represented in Figure 1.

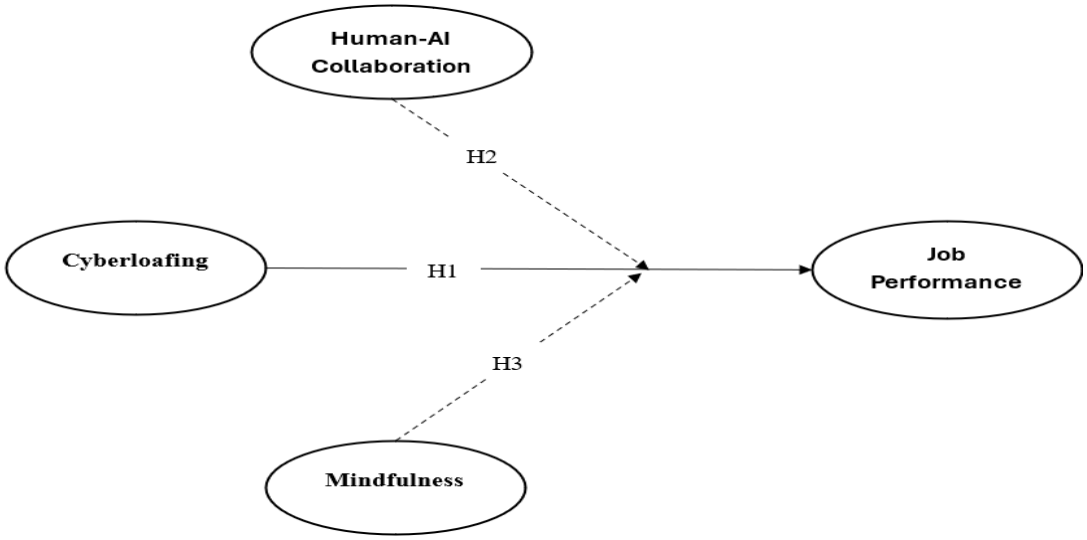

Figure 1. Research model

Cyberloafing and Job Performance

Employee performance is a frequently discussed and critical element for hospitality and tourism organizations striving to meet their strategic goals and objectives (Hashad et al., 2023). Defined as an individual's proficiency in executing assigned duties within a designated timeframe (Kim & Beehr, 2017), employee performance reflects the extent to which individuals contribute to organizational goals through the fulfillment of their formal job responsibilities. Sao et al. (2020) defined job performance as the standard upon which decisions regarding salary adjustments, rewards, promotions, evaluations, and disciplinary actions are based. Moreover, job or employee performance is widely acknowledged as a key indicator of overall organizational performance (Kularathne & Senevirathne, 2021). Within the hospitality industry, exceptional job performance is particularly salient, playing a pivotal role in enhancing customer satisfaction and delivering superior service. This, in turn, fosters repeat business and cultivates customer loyalty (Alexandro et al., 2021). Ultimately, strong employee performance is fundamental for driving financial growth and securing long-term competitiveness for organizations (Aftab et al., 2023). Therefore, acquiring a thorough understanding of the interplay between employee behaviors, organizational factors, and consequent job performance remains crucial for hospitality businesses (Abouelenien et al., 2024; Iskandar et al., 2024).

The increasing prevalence of technology and internet access in the workplace, intended to support employee performance, has inadvertently led to the phenomenon of cyberloafing, wherein employees utilize these resources for personal purposes during working hours (Rahman et al., 2022). Engaging in non-work-related internet activities during work time directly diverts employees' attention from their primary responsibilities, potentially undermining their performance due to the cognitive distraction imposed by personal interests and demands (Karyatun et al., 2023). Existing research suggests a complex relationship between cyberloafing and employee outcomes, with some findings indicating that certain outcomes, such as mental recovery, work-life balance, and heightened positive affect, may indirectly enhance

job performance. Conversely, other consequences of cyberloafing, including diminished work time, mental distraction, and increased negative emotions, have been shown to negatively impact job performance (Jiang et al., 2023). Kularathne and Senevirathne (2021) specifically highlighted an inverse relationship between cyberloafing and employee performance, asserting that cyberloafing exerts a detrimental effect. The allocation of working hours to activities such as online shopping or viewing non-work-related videos directly reduces the time available for task completion, thereby hindering overall work performance. Reinforcing this notion, Karyatun et al. (2023) found a negative and significant relationship between cyberloafing and employee performance, attributing this to employees' engagement in activities like reading online news and frequenting social media platforms for non-work-related communication (e.g., WhatsApp, Instagram, Twitter, Facebook). Such behaviors can lead to tardiness in task completion and the neglect of responsibilities assigned by management.

Drawing upon the JD-R model and prior studies, the adverse consequences of cyberloafing are likely to manifest when the extent of this behavior surpasses an individual's available resources and energy levels. We posit that there exists an optimal threshold of cyberloafing within the workplace. When employees exceed this threshold, the demands associated with cyberloafing outweigh their available job resources, leading to detrimental effects within the work context and a subsequent decline in performance. Consequently, we hypothesize that:

H1: Cyberloafing behaviors negatively impact employees' job performance.

The Moderating Role of Human-AI Collaboration

Human–AI collaboration (HAIC) denotes an interactive and cooperative synergy between human employees and artificial intelligence, directed towards the effective and efficient accomplishment of work-related tasks (Kong et al., 2023). This collaborative dynamic exerts a considerable influence on both the behaviors and overall performance of employees within organizations (Ma et al., 2024; Yu & Arshad, 2025). Empirical evidence suggests that when employees collaborate with AI systems, there is a significant enhancement in individual work efficiency and the quality of output. Furthermore, such collaboration can afford employees more time to dedicate to creative and innovative endeavors (Duan et al., 2024; Wu et al., 2024). The integration of AI within an organization has the potential to improve employee performance, particularly within an environment that fosters knowledge sharing and mutual learning. HAIC can enable organizations to cultivate a supportive environment conducive to retaining skilled personnel and provide a platform for enhancing overall organizational productivity (Olan et al., 2024). Moreover, HAIC may cultivate a more positive perception of the workgroup among employees. Employees engaged in such collaborations may also perceive their workgroup as exhibiting superior performance compared to those without AI collaboration opportunities (Vrontis et al., 2023; Zhang et al., 2025). HAIC motivates employees to align their behaviors with organizational objectives and potentially reduces the propensity for cyberloafing behaviors (Xu et al., 2025; Yan & Teng, 2025).

The regulation and mitigation of cyberloafing behaviors have consistently represented a key concern for organizations and their management (Mkhize et al., 2024). Research

has demonstrated that cyberloafing directly curtails the time dedicated to work-related responsibilities, thereby depleting employees' finite resources and energy reserves (Kamila & Muafi, 2023; Karyatun et al., 2023). Drawing upon the JD-R model, it is posited that efficient HAIC can potentially mitigate these effects by conserving employees' time and cognitive resources through the automation of routine tasks and the streamlining of workflows (Babar et al., 2025). Consequently, employees may be able to allocate a greater proportion of their time and energy to tasks that are more engaging and aligned with their professional interests, thereby potentially reducing cyberloafing behaviors driven by feelings of boredom or job dissatisfaction (Xu et al., 2025). Simultaneously, the HAIC facilitates the prompt delivery of pertinent information and the iterative generation of customized work outcomes through sustained interaction with employees (Kong et al., 2023; Ma et al., 2024), which can ultimately contribute to an enhancement in overall job performance. Therefore, we hypothesize that:

H2: Human-AI collaboration significantly moderates the impact of cyberloafing behaviors on employees' job performance.

The Moderating Role of Mindfulness

Mindfulness has increasingly been recognized as an inherent human capacity to intentionally focus complete attention on the present moment (Pattnaik & Jena, 2020). Defined as the individual capability to maintain presence in a specific situation with complete concentration, awareness, and a non-judgmental attitude (Germer et al., 2005), mindfulness represents a state of consciousness characterized by focused attention on present-moment phenomena, both internal and external (Dane, 2011). This mental state has been shown to indirectly mitigate employees' psychological distress by fostering engagement in activities with greater confidence and in navigating challenging situations (Bihari & Mullan, 2014), as well as by reducing susceptibility to distractions such as cyberloafing (Chen et al., 2023). A heightened awareness of both internal and external stimuli pertinent to the task at hand decreases the probability of errors, consequently leading to improved performance outcomes (Dane, 2011).

As elucidated by He et al. (2023), a mindful employee can maintain focus on the current moment, thereby preventing cognitive wandering. This enables the individual to direct their attention towards salient needs, tasks, and stability, exercising greater control and efficiency, and ultimately enhancing their attentional capabilities. Indeed, scholars have found a positive correlation between mindfulness and employee performance (Amalia et al., 2024). Existing literature further substantiates the inverse relationship between mindfulness and cyberloafing. Wan et al. (2020) demonstrated that employees exhibiting higher levels of mindfulness tend to display lower moral disengagement, thereby reducing their inclination to engage in counterproductive work behaviors such as cyberloafing. Their argument posits that mindfulness diminishes moral disengagement by strengthening self-regulatory resources related to attention and awareness. Moreover, mindfulness has been employed as a moderator in numerous studies examining diverse organizational outcomes, including the relationship between workplace ostracism and job performance (Jahanzeb et al.,

2020), cyberloafing and mental health (Liu & Zhang, 2023), and work engagement and cyberloafing (Khari & Sinha, 2025).

From the perspective of the Job Demands-Resources (JD-R) model, employees require personal resources to effectively manage both work-specific and generally uncertain job demands (Bakker & Demerouti, 2017). Mindfulness encourages employees to feel a stronger connection to organizational goals and values, such that engaging in cyberloafing could be perceived as self-detrimental (Levesque & Brown, 2007). Furthermore, mindfulness may enable employees to regulate their engagement in cyberloafing, thereby preventing excessive depletion of resources that could negatively impact performance (Zoghbi-Manrique-de-Lara et al., 2020). We contend that employees with higher levels of mindfulness are likely to experience greater absorption and engagement in their work, thus exhibiting a reduced propensity for cyberloafing. Based on this rationale, we hypothesize that:

H3: Mindfulness moderates the impact of cyberloafing behaviors on employees' job performance.

Method

Data collection

Our study employed a self-report questionnaire survey, which was distributed online to collect data. This method was deemed appropriate based on prior meta-analytic findings (Berry et al., 2012), which suggest that other-report measures offer limited incremental validity over self-reports for deviant behavior. Furthermore, the use of anonymous self-report measures is recognized as a valuable approach for investigating sensitive behaviors such as deviance in organizational contexts (Boman & Gibson, 2011). To ensure participant anonymity and encourage candid responses, the survey was administered online.

Data were gathered from a sample of 311 full-time reservation employees working within Egyptian five-star hotels and Category A travel companies in Greater Cairo region. Participants were recruited using a convenience sampling technique between March and June 2025. This sampling method has been utilized in previous research addressing sensitive topics, including cyberloafing (Ramdani et al., 2024; Elsaied et al., 2025). Reservation employees were selected due to the nature of their work, which necessitates frequent and extensive use of computers and the Internet throughout their work shifts. The chosen organizational settings were targeted for their documented integration of AI technology and related digital tools into daily operations (Magdy & Hassan, 2025), providing a relevant context for examining the interplay between contemporary workplace environments, cyberloafing behaviors, and job performance.

The adequacy of the sample size was determined based on the guidelines proposed by Hair et al. (2010), which recommend a minimum item-to-response ratio of 1:10. Given that the questionnaire comprised 25 items, a sample size of 250 participants was considered sufficient for the intended statistical analyses. The final sample size of 311 exceeded this recommendation, further bolstering the statistical power of the study.

Measures

Cyberloafing (Cyl) was assessed using a 5-item scale adapted from Elsaied et al. (2025). This instrument has demonstrated its applicability and is frequently employed within hospitality and tourism research (Özek et al., 2023; Peng et al., 2023). A sample item from the scale is, "I browse breaking news websites during work," which measured the extent to which respondents engaged in cyberloafing activities. Responses were captured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The reliability analysis for this study yielded a Cronbach's alpha coefficient of 0.85, indicating a high level of internal consistency for the scale within this sample.

Employee job performance (JP) was measured using an 8-item scale adapted from Hashad et al. (2023). A representative item from the scale was, “My work is always of high quality.” Prior research by Abouelenien et al. (2024) has established the strong reliability of this scale, reporting a Cronbach's alpha coefficient of 0.88. In the current study, the items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The internal consistency reliability for this scale within our sample was found to be high, with a reported Cronbach's alpha of 0.932.

Employees' mindfulness (Minf) was assessed using a 7-item scale adapted from Erdurmazlı et al. (2022). As an illustrative example, one item from this scale stated, “When I am working, my attention is completely focused on my work,” which measured the extent to which respondents exhibited mindful engagement in their tasks. Participants indicated their agreement with each statement using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The internal consistency of this scale in the present study was high, as indicated by a Cronbach's alpha coefficient of 0.915.

Employees' human-AI collaboration (HAIC) was evaluated using a 5-item scale adapted from Xu et al. (2025). A sample item from this scale is, “AI tools and I collaborate to enhance work outcomes,” which measured the extent to which respondents perceived collaboration with artificial intelligence tools in their work. Participants indicated their agreement with each statement using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The internal consistency of this scale in the present study was high, as indicated by Cronbach’s alpha coefficient of 0.919.

Data analysis

This study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) for data analysis, a robust and widely recognized statistical technique suitable for both confirmatory and exploratory investigations aimed at theory validation and extension. PLS-SEM facilitates efficient data processing within complex structural models, rendering it particularly well-suited for research in strategic and management domains, including the field of hospitality and tourism (Eladawi et al., 2024; Abd El-majeed et al., 2025). Data processing for this research was conducted using WarpPLS statistical software, version 7.0 (Kock, 2021). SEM is comprised of two primary sub-models: the outer model and the inner model.

A. Outer model assessment

The assessment of the outer model focuses on evaluating the validity and reliability of the latent constructs as measured by their respective indicators. This evaluation encompasses several key criteria:

Convergent validity: Convergent validity was evaluated to determine the extent to which the indicators of a specific construct are significantly and positively correlated. Following established guidelines for confirmatory research, indicator loadings were expected to exceed 0.70; for exploratory research, a threshold of 0.60 is considered acceptable (Sarstedt et al., 2021). Furthermore, the average variance extracted (AVE) for each construct was required to surpass the recommended value of 0.50 (Hair et al., 2021), indicating that, on average, the construct explains more than half of the variance in its indicators.

Discriminant Validity: Discriminant validity was examined to ascertain the degree to which each construct is distinct from other constructs within the model. To establish discriminant validity, two primary criteria were considered. First, the cross-loadings of each indicator on its designated construct were required to be higher than its loadings on any other construct in the model. Second, the Fornell-Larcker criterion was applied, which posits that the square root of the AVE for each construct should exceed its correlation with any other construct (Franke & Sarstedt, 2019), signifying that each construct shares more variance with its indicators than with other constructs.

Reliability: The reliability of the measurement instrument was assessed to ascertain the consistency and accuracy with which each construct was measured. The established benchmarks for reliability were Cronbach's Alpha and Composite Reliability coefficients, both of which were required to exceed the minimum acceptable threshold of 0.70 (Kock, 2021). Meeting these criteria indicates a satisfactory level of internal consistency and reliability for each construct.

B. Inner model assessment

The evaluation of the inner model focuses on examining the hypothesized causal relationships between the latent variables. This assessment includes the following key indicators:

Coefficient of determination (R^2): The R^2 value serves as a measure of the structural model's predictive power for each endogenous latent variable. Following established benchmarks, an R^2 value above 0.67 is considered substantial, values between 0.33 and 0.67 are deemed moderate, and values between 0.19 and 0.33 are indicative of weak predictive strength. R^2 values below 0.19 are generally considered unacceptable, suggesting a limited explanatory capability (Chin, 1998).

Variance inflation factor (VIF): The VIF was assessed to evaluate the degree of multicollinearity among the predictor variables. To ensure the robustness of the model and avoid issues associated with multicollinearity, VIF values for each predictor were required to remain below the commonly accepted threshold of 3.3 (Hair et al., 2021).

Predictive relevance (Q^2): The predictive relevance of the structural model was evaluated using Stone-Geisser (Q^2). A Q^2 value greater than zero indicates that the model possesses significant predictive capabilities beyond a naive benchmark (Kock,

2021), demonstrating its ability to accurately predict the indicators of the endogenous constructs.

Path coefficients: Path coefficients quantify the strength and direction of the hypothesized relationships between the latent variables. These coefficients range from -1 to +1, with values closer to +1 indicating a stronger positive relationship and values closer to -1 indicating a stronger negative relationship. The statistical significance of each path coefficient was determined by its associated p-value, with a threshold of $p < 0.05$ (Hair et al., 2019) indicating a statistically significant relationship.

Model Fit: The overall fit of the structural model was assessed using various indices, including the Average Path Coefficient (APC), Average R-Squared (ARS), and Tenenhaus GoF (Goodness of Fit). The model is considered to exhibit an acceptable fit if it meets the established criteria for these indices, providing evidence for the overall validity of the hypothesized relationships (Kock, 2021).

Common method bias

To mitigate potential concerns regarding common method variance (CMV), a pre-analysis assessment was conducted. Following established methodological practices (Kock et al., 2021), both Harman's single-factor test and full collinearity VIFs were employed. The results of Harman's single-factor test revealed that no single factor accounted for a majority (over 50%) of the total variance, suggesting that CMV was not a significant issue. Furthermore, examination of the full collinearity VIF values (presented in Table 2) indicated that all values remained below the critical threshold of 3.3 (Hair et al., 2021), further confirming the absence of substantial multicollinearity that could be indicative of CMV bias among the latent variables. Consequently, the findings of these analyses suggest that common method variance is unlikely to have significantly influenced the results of this study.

Results

Descriptive statistics of the sample

The final sample for this study consisted of 311 reservation employees working within the Egyptian hospitality and tourism sector, specifically from five-star hotels and Category A travel companies. In terms of gender, the sample exhibited a near-balanced distribution, with 163 participants identifying as male (52.4%) and 148 as female (47.6%). Regarding the age profile of the respondents, a notable proportion (33.8%, n = 105) fell within the 26 to 35 years age range, suggesting a representation of employees in their early to mid-career stages. The educational level of the participants indicated a highly educated sample, with the vast majority (88.1%, n = 274) holding a bachelor's degree as their highest level of education. Concerning organizational tenure, approximately half of the participants (49.5%) reported having worked for their current organization for a duration exceeding 11 years. This indicates a significant level of experience and potentially strong ties to their respective workplaces. Furthermore, the representation of the two types of establishments within the sample was relatively even. Specifically, 48.9% of the respondents (n = 152) were employed in five-star hotels, while the remaining 51.1% (n = 159) worked in Category A travel agencies, ensuring a balanced perspective from these key segments of the industry. These detailed sample characteristics are summarized in Table 1.

Table 1. Description of respondents (N=311)

		Frequency	Percent
Gender	Male	163	52.4
	Female	148	47.6
Age	≤ 25	82	26.3
	26- ≤35	105	33.8
	36- ≤45	69	22.2
	>46	55	17.7
Education	Bachelor	274	88.1
	Postgraduate degree	37	11.9
Experience in the same organization	≤ 5 years	65	21.2
	6-10 years	91	29.3
	+11 years	155	49.5
Workplace	Hotel	152	48.9
	Travel agency	159	51.1

The results of the PLS analysis revealed that all indicator loadings ranged from 0.630 to 0.909, exceeding the generally accepted minimum threshold for indicator reliability. Furthermore, the composite reliability (CR) values for all reflective constructs were above 0.70, ranging from 0.894 to 0.945. These findings indicate that the indicators demonstrated adequate reliability and that the reflective constructs exhibited strong internal consistency within the measurement model.

Table 2. Factor loadings, CR, and VIF.

Indicators	Cyberloafing (Cyl)	Job Performance (JP)	Human-AI Collaboration (HAIC)	Mindfulness (Minf)	CR	VIF
Cyl.1	**(0.649)**	0.080	0.153	0.271	0.894	1.164
Cyl.2	**(0.796)**	-0.169	-0.151	-0.017		
Cyl.3	**(0.871)**	-0.164	-0.154	0.100		
Cyl.4	**(0.809)**	-0.205	-0.108	0.143		
Cyl.5	**(0.822)**	-0.130	-0.062	0.174		
JP.1	-0.124	**(0.877)**	0.612	0.526	0.945	1.867
JP.2	-0.036	**(0.804)**	0.468	0.347		
JP.3	-0.141	**(0.889)**	0.574	0.359		
JP.4	-0.197	**(0.883)**	0.557	0.410		
JP.5	-0.158	**(0.883)**	0.486	0.371		
JP.6	-0.217	**(0.864)**	0.542	0.399		
JP.7	0.015	**(0.757)**	0.581	0.514		
JP.8	-0.183	**(0.630)**	0.459	0.167		
HAIC.1	-0.139	0.565	**(0.850)**	0.385	0.939	2.221
HAIC.2	-0.087	0.628	**(0.840)**	0.602		
HAIC.3	-0.152	0.449	**(0.863)**	0.431		
HAIC.4	-0.066	0.638	**(0.909)**	0.522		
HAIC.5	0.036	0.528	**(0.881)**	0.460		
Minf.1	0.136	0.452	0.405	**(0.833)**	0.933	1.788
Minf.2	0.248	0.437	0.511	**(0.836)**		
Minf.3	0.065	0.380	0.526	**(0.897)**		
Minf.4	0.179	0.254	0.413	**(0.797)**		
Minf.5	-0.030	0.395	0.360	**(0.630)**		

Minf.6	0.118	0.388	0.461	**(0.847)**		
Minf.7	0.180	0.404	0.468	**(0.856)**		

Table 3 presents the outcomes of the convergent and discriminant validity assessments. The AVE values for all constructs exceeded the recommended threshold of 0.500, ranging from 0.629 to 0.756. This indicates that, for each construct, the indicators accounted for more than 50 percent of the variance in the construct, thus establishing satisfactory convergent validity. Furthermore, as shown in Table 3, the square root of the AVE for each construct was greater than its correlation with other latent constructs in the model, providing evidence for discriminant validity based on the Fornell-Larcker criterion. Additionally, the Heterotrait-Monotrait (HTMT) ratios presented in Table 4 were all below the recommended threshold of 0.85 (Hair et al., 2019). This further supports the discriminant validity of the constructs, indicating that they are empirically distinct from one another. Collectively, these results confirm that both convergent and discriminant validity requirements are met in this study.

Table 3. Fornell– Larcker results

	Cyl AVE=**0.629**	JP AVE=**0.685**	HAIC AVE=**0.756**	Minf AVE=**0.668**
Cyberloafing (Cyl)	**0.793**	-	-	-
Job Performance (JP)	-0.158	**0.828**	-	-
Human-AI Collaboration (HAIC)	-0.093	0.646	**0.869**	-
Mindfulness (Minf)	0.162	0.472	0.552	**0.818**

Table 4. HTMT ratio

(good if < 0.90, best if < 0.85)	Cyl	JP	HAIC	Minf
Cyl	**-**	-	-	-
JP	0.219	-	-	-
HAIC	0.187	-	-	-
Minf	0.228	0.512	0.602	-
P values (one-tailed) for HTMT ratios (good if < 0.05)	Cyl	JP	HAIC	Minf
Cyl	-	-	-	-
JP	<0.001	-	-	-
HAIC	<0.001	0.003	-	-
Minf	<0.001	<0.001	<0.001	-

Table 5 presents the overall model fit indices for the hypothesized structural model. The average path coefficient (APC) demonstrated a statistically significant and acceptable positive value (APC = 0.358, $p < 0.001$). Similarly, the average R-squared (ARS = 0.432, $p < 0.001$) and average adjusted R-squared (AARS = 0.406, $p < 0.001$) values were also statistically significant and within acceptable ranges, indicating a satisfactory level of explained variance across the endogenous variables. Furthermore, assessments for multicollinearity within the model revealed no significant concerns, as indicated by the average block VIF (AVIF) and average full collinearity (AFVIF) values, both remaining below the critical threshold of 3.3. Additionally, several indices specifically designed to detect potential issues with model misspecification and causal interpretability demonstrated satisfactory results. Collectively, these comprehensive model fit indicators presented in Table 5 provide strong evidence for the overall suitability, validity, and reliability of the research model.

Table 5. Model fit results

	Assessment	Criterion	Decision
Average path coefficient (APC)	0.358, P<0.001	P<0.05	Supported
Average R-squared (ARS)	0.432, P<0.001	P<0.05	Supported
Average adjusted R-squared (AARS)	0.406, P<0.001	P<0.05	Supported
Average block VIF (AVIF)	1.119	acceptable if <= 5, ideally <= 3.3	Supported
Average full collinearity VIF (AFVIF)	1.769	acceptable if <= 5, ideally <= 3.3	Supported
Tenenhaus GoF (GoF)	0.584	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)	1.000	acceptable if >= 0.7	Supported

Multi-group analysis (MGA)

MGA, as shown in Table 6, was performed to explore potential variations in structural relationships based on participant demographics. The results indicated no statistically significant differences (p= 0.207) in the moderating role of mindfulness path coefficients across the examined groups. This suggests a consistent influence of mindfulness on customer responses and identified relationships, irrespective of demographic characteristics. However, the MGA revealed statistically significant differences ($p < 0.001$) in the cyberloafing-job performance relationship and the moderating role of human-AI collaboration path coefficients across groups. The difference in the cyberloafing-job performance relationship was found to be more pronounced in travel agencies. While cyberloafing generally negatively impacts job performance across work environments, its detrimental effects appear to be amplified within travel agencies. This heightened vulnerability can be attributed to the nature of work in this sector, which typically involves real-time client interactions and potentially less stringent monitoring of internet usage, making it particularly susceptible to the negative consequences of employees engaging in non-work-related online activities (Elsaied et al., 2025). This contrasts with hotel environments where employees often have more diverse roles and workplace responsibilities.

Regarding the moderating role of human-AI collaboration, the observed difference favored hotels. This could be attributed to hotels' potentially greater access to and integration of global information updates and technology, alongside their adherence to standardized procedures and commitment to ongoing employee training and learning initiatives. Given that human-AI collaboration has been shown to influence employee learning behaviors, creativity, and overall well-being (Aly, 2024), its effective implementation in hotels may contribute to a reduction in cyberloafing behaviors.

Table 6. Multi-group analysis

Group pair results (Hotels=1 (N=152); Travel Agency=2 (N=159))						
Path coefficient	Path coeff. (Hotel)	Path coef. (Travel Agency)	Absolute path coeff. Diff.	p-values	T-statistic	Decision
Cyl→JP	-0.413	0.094	0.349	<0.001	3.312	Significant
HAIC*Cyl	0.257	-0.947	0.457	<0.001	4.488	Significant
Minf*Cyl	-0.279	-0.211	0.093	0.207	0.817	Not significant

Testing hypothesis

After confirming the measurement model's adequacy, the statistical significance of the path coefficients was assessed using standard bootstrapping procedures. The outcomes of the hypothesis testing, as depicted in Figure 2, revealed a significant negative relationship between cyberloafing behaviors and employee job performance (β= -0.32, p< 0.01), thus supporting H1. This finding suggests that a higher prevalence of cyberloafing behaviors among employees is associated with a statistically significant decrease in their job performance.

Furthermore, the moderating roles of human-AI collaboration and mindfulness on the relationship between cyberloafing behaviors and employee job performance were examined. The results indicated that both human-AI collaboration (β= -0.41, p< 0.01) and mindfulness (β= -0.34, p< 0.01) significantly and negatively moderated this relationship, providing support for H2 and H3. These findings imply that when employees experience greater levels of collaboration with AI or possess higher degrees of mindfulness, the negative impact of cyberloafing behaviors on their job performance is significantly weakened.

The explanatory power of the proposed model was evaluated using the coefficient of determination (R^2) calculated through PLS. As presented in Figure 2, cyberloafing accounted for 43% of the variance in job performance (R^2 = 0.43). This R^2 value indicates that a substantial proportion of the variance in employee job performance can be statistically explained by cyberloafing behaviors, suggesting a significant predictive capability of this construct concerning the outcome variable (job performance). Furthermore, the predictive relevance of the reflective measurement model was assessed using the Q^2 coefficient (Q^2 = 0.45). The obtained Q^2 value surpasses the threshold of zero, indicating a moderate predictive power of the model's constructs in explaining the variance of the endogenous latent variable (job performance).

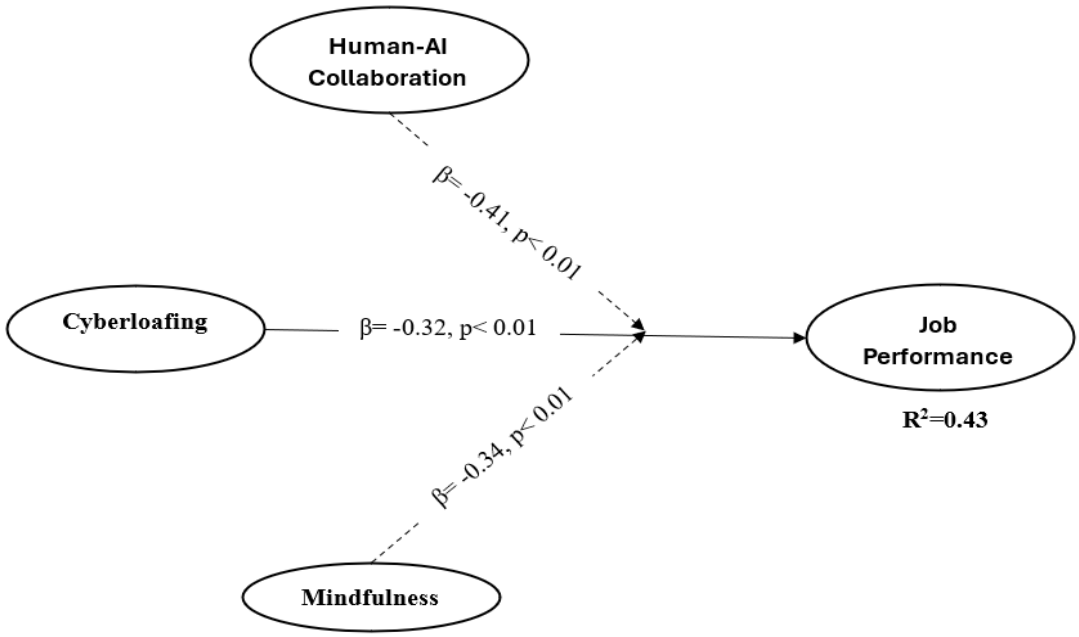

Figure 1. Path coefficients of the structure model

Discussion

Based on the existing literature and recent studies, it is widely acknowledged that employee cyberloafing represents a significant concern within the hospitality and tourism sector due to its detrimental effects on job performance (Elsaied et al., 2025; Magdy & Hassan, 2025; Khari & Sinha, 2025). Consistent with prior research (Kularathne & Senevirathne, 2021; Kamila & Muafi, 2023; Karyatun et al., 2023), findings indicate a robust negative correlation between cyberloafing and job performance, supporting the notion that non-work-related internet usage during working hours (cyberloafing) diminishes employee productivity (H1 supported). This inverse relationship is particularly salient in the hospitality and tourism industry, where many roles necessitate direct and focused interaction with customers, rendering time spent on personal online activities counterproductive to service delivery (Elsaied et al., 2025). The diversion of work time to activities such as online shopping directly impedes task performance and reduces overall efficiency (Kularathne & Senevirathne, 2021). Furthermore, workplace stressors, including job insecurity, increased workload, job boredom, and lack of engagement, have been identified as antecedents that may drive employees towards cyberloafing, thereby exacerbating the decline in job performance (Kamila & Muafi, 2023; Karyatun et al., 2023).

The study's findings robustly support the moderating roles of human-AI collaboration and employee mindfulness in the relationship between cyberloafing and job performance, thereby reinforcing the tenets of the JD-R model (Demerouti et al., 2001) by underscoring their capacity to influence autonomous motivations, such as cyberloafing behavior. Specifically, the results corroborate the assertion that human-AI collaboration functions as a crucial job resource, effectively mitigating the negative impact of cyberloafing on job performance (supporting H2). Assistance provided by AI may foster increased reliance, enabling employees to complete tasks through collaborative AI efforts rather than being diverted by non-work-related online activities (Ma et al., 2024). This synergy can liberate employees' time and cognitive resources, enhance their work experience and reduce negative emotional states (Yan & Teng, 2025), which in turn contributes to a more positive work environment and improved performance levels (Olan et al., 2024). Moreover, the integration of AI in work processes may cultivate a heightened sense of responsibility and accomplishment among employees, encouraging a more focused and dedicated approach to their job responsibilities (Xu et al., 2025). Consequently, a strengthened AI identity may further incentivize behaviors aligned with professional norms, thereby inhibiting cyberloafing tendencies and promoting job performance.

Furthermore, the study confirms that mindfulness serves as a significant intrapersonal resource (Bakker & Demerouti, 2017), capable of buffering the detrimental effects of cyberloafing on job performance (supporting H3). Mindfulness enables employees to develop a greater non-judgmental awareness of their internal drives, impulses, and needs, facilitating more considered and reflective choices regarding their behavior. This aligns with previous research by Usman et al. (2021), which demonstrated an inverse relationship between the perception of meaningful work and employee cyberloafing, with meaningful work being a central determinant of job performance. Employees who perceive their work as contributing meaningfully are more likely to

exhibit stronger organizational commitment and are therefore less inclined to engage in behaviors deemed detrimental to the organization, such as cyberloafing (Usman et al., 2021). As posited by the JD-R model (Demerouti et al., 2001), the experience of meaningful work discourages negative attitudes and undesirable workplace behaviors, including cyberloafing.

Theoretical and practical implications

This research offers several notable theoretical contributions by employing the Job Demands-Resources (JD-R) model (Demerouti et al., 2001) as the central framework for examining cyberloafing as a counterproductive work behavior within the hospitality and tourism industry. Firstly, the study introduces and empirically validates a novel conceptual model that delineates the mechanisms through which human-AI collaboration and employee mindfulness act as facilitators of employee performance and buffers against the adverse effects of cyberloafing on job performance. This integrated model significantly advances the existing literature on cyberloafing and counterproductive work behaviors by providing a robust theoretical foundation for understanding the interplay between job resources, personal resources, and their subsequent impact on employee outcomes within the context of the JD-R model. Secondly, this study further contributes to the understanding of cyberloafing by rigorously examining its impact on employee performance through the lens of the Job Demands-Resources (JD-R) model. Consistent with the model's perspective on cyberloafing as a potentially detrimental behavior, our findings support the notion that engaging in non-work-related online activities during work hours can amplify job demands. This occurs by distracting employees' finite resources, such as time and cognitive energy, and by hindering their focus on assigned tasks, ultimately leading to a reduction in job performance. While acknowledging the alternative conceptualization by Kwala and Agoyi (2025), who propose that cyberloafing can function as a resource for stress reduction, mental relaxation, and enhanced creativity, thereby positively influencing well-being and performance, our results demonstrate that within the context of this study, cyberloafing primarily acts as a behavior to job demands, which, paradoxically, results in decreased employees' job performance. Thirdly, this study holds the distinction of being among the first to systematically analyze the moderating influence of human-AI collaboration and mindfulness on the relationship between cyberloafing and job performance, specifically within the Egyptian tourism sector. By integrating these crucial factors into a theoretical framework derived from the JD-R model, this research offers valuable insights into how human-AI collaboration, as a job resource that enables task completion with AI assistance, and mindfulness, as a key intrapersonal resource fostering self-awareness and organizational commitment, can mitigate the negative consequences associated with cyberloafing behaviors in this specific industry context. This exploration of the interplay between technological advancements, individual psychological states, and counterproductive work behaviors in the unique setting of the Egyptian tourism sector represents a significant theoretical advancement.

This study yields several key managerial implications for the hospitality and tourism industry. Firstly, the demonstrated negative correlation between cyberloafing behaviors and employee job performance underscores the importance for managers to

develop and implement proactive policies aimed at mitigating such counterproductive behaviors. Potential strategies include the judicious restriction of Wi-Fi access, the blocking of time-wasting websites (e.g., social media and video-sharing platforms), the deployment of internet usage monitoring systems, and the cultivation of a work culture that emphasizes green behavior and aligns with green organizational values. Secondly, the identified moderating effect of AI collaboration on the relationship between cyberloafing and job performance offers valuable practical insights for organizations seeking to enhance performance and reduce non-work-related internet use. Effective integration of AI into work processes holds the potential to improve both work efficiency and the quality of task execution, concurrently diminishing instances of unnecessary employee cyberloafing. This contributes to improved organizational discipline and an optimized work environment. Consequently, hospitality and tourism organizations should prioritize the adoption of an AI-collaborative work model, strategically integrating AI tools into employees' daily operations through careful planning and implementation. Managers must acknowledge the role of AI not only in task completion but also in potentially guiding employee behavior. By providing targeted training, hospitality and tourism organizations can equip their employees with the necessary skills to effectively collaborate with AI systems, thereby mitigating cyberloafing that may arise from a lack of familiarity or resistance to these technologies. Thirdly, the finding that higher levels of employee mindfulness can lessen the negative impact of cyberloafing on job performance highlights the beneficial role of this intrapersonal resource. Hospitality and tourism organizations are encouraged to consider initiatives aimed at enhancing employee mindfulness through the sponsorship of relevant programs and interventions. Mindfulness training, which typically involves cultivating focused attention and non-judgmental acceptance of present-moment experiences, can be a valuable tool in fostering greater self-awareness and promoting more focused work behaviors.

Limitations and future research

The interpretation of the study's findings should be undertaken with consideration of its inherent limitations. Firstly, the reliance on cross-sectional data impedes the establishment of definitive causal relationships between the variables in the proposed model. While the hypothesized directionality of the results is theoretically grounded and supported by prior research, longitudinal studies are warranted to ascertain causality. Secondly, the exclusive use of self-reported questionnaires from a single source introduces the potential for CMV. Although statistical assessments, following the guidelines of Kock (2021) and Hair et al. (2021) through Harman’s single-factor test and VIFs, indicated that CMV was not a significant threat, future research would benefit from employing multi-wave and dyadic data collection methodologies to mitigate this limitation. Thirdly, while the study focused on the moderating roles of HAIC and mindfulness, future investigations could expand the model by examining the potential moderating or mediating effects of other pertinent variables such as internal locus of control, job boredom, job alienation, and domain self-efficacy. Finally, the specific focus on five-star hotels and category (A) travel agencies within Egypt restricts the direct generalizability of the findings to other organizational contexts. Subsequent research should aim to explore these relationships across a more

diverse range of organizational settings within the hospitality and tourism industry, both within Egypt and regionally, to enhance the external validity of these findings.

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