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AI-DRIVEN WORKFORCE PERFORMANCE: EXAMINING THE INFLUENCE OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN HOTEL ORGANISATIONS

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Abstract:

The development of artificial intelligence (AI) has evolved rapidly over the past several decades, transforming industries and everyday life. AI in organisations refers to technology that automates operations, enhances customer service, boosts operational efficiency, analyses customer preferences, and facilitates data-driven decisions to improve operational performance and customer satisfaction. Hotel companies are rapidly adopting AI to improve strategic decision-making, automate repetitive tasks, and provide highly customised guest experiences as the needs of contemporary visitors change and competition intensifies. This study aims to explore the influence of AI technology, namely operational efficiency, cognitive literacy, and augmented engagement, towards employee job performance among hotel employees in Putrajaya, Malaysia. A quantitative study approach has been adopted by distributing a questionnaire to 225 hotel employees. The data have been gathered and analysed using a reliability test, descriptive statistics, correlation, and multiple regression analyses. The findings indicate that the dimensions of AI technology have a significant effect on employees' job performance. The findings have revealed that cognitive literacy and augmented

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engagement had a significant influence on employee job performance in hotel organisations. To further enhance performance in AI-driven hotel environments, the study emphasises the importance of adopting a human-centred perspective when utilising AI. The study contributes to the limited body of research that focuses on the trends and antecedents of employee job performance in the hotel industry. Besides, it serves as a foundation, inspiring future researchers to explore other factors that may shape employee job performance, such as leadership style, organisational support, digital confidence, and motivation.

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Keyword:

AI Technology, Augmented Engagement, Cognitive Literacy,
Employee Job Performance, Operational Efficiency.



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Introduction

The hotel industry, which includes places like hostels, motels, and guest houses, is one of the fastest-growing sectors and is expected to be worth \$1,663.82 billion worldwide by 2029 (Barten, 2024). Recent advancements in artificial intelligence (AI) have markedly revolutionized the hospitality sector by improving operational efficiency, service quality, and client experiences. AI-driven solutions, including chatbots, service robots, face recognition systems, predictive analytics, automated check-in/check-out systems, and personalized recommendation engines, have become increasingly prevalent in hotel operations. Thus, AI has become a strategic asset that allows hotels to enhance service delivery, decrease operational expenses, and sustain competitiveness in a more digital marketplace (Mariani & Borghi, 2021; Mariani et al., 2022; Mariani & Borghi, 2024).

Despite fast developments of AI applications in hospitality, literature has mainly focused on customer-oriented and operational perspectives. Numerous investigations have been dedicated to topics such as guest acceptance of AI technologies, customer satisfaction, service quality, customer experience, innovations in smart hotels, service automation, AI adoption, and organizational digital transformation (Buhalis & Leung, 2018; Gursoy et al., 2019; Ivanov & Webster, 2019; Mariani & Borghi, 2021; Mariani et al., 2022). However, far less attention has been given to the human resource aspect of AI technology on people's job performance. As more hotels implement AI into their operational processes, staff are still required in the areas of service delivery, decision making, problem solving and customer relations. The goals behind the AI technologies are to automate repetitive tasks and augment employee capabilities through better decision-making, knowledge sharing, workload alleviation, and more efficient working processes. Therefore, understanding the relationship between AI-related competencies and

employee performance is crucial for guaranteeing that technology investments translate into long-term organizational value (Jaiswal et al., 2022; Mariani & Borghi, 2024).

Moreover, empirical evidence regarding the AI and employee performance in the hotel industry is still limited, particularly in the developing economies like Malaysia. The majority of existing hospitality research has been carried out in technologically advanced countries, and very few studies have explored the effects of AI-related factors on hotel staff in the Malaysian hospitality industry. The impact of mainstream AI technology on job performance and employee engagement with mainstream AI technology is reliant on the organization's readiness, digital infrastructure, workforce skills and AI deployment techniques. Thus, the findings from other national settings are not directly transferable to Malaysian hotel organization. Moreover, previous research has focused on AI adoption at the organizational level or employees' general acceptance of AI technology, rather than examining the specific AI-related factors that enhance employee job performance. An integrated framework approach has not been empirically explored enough to study factors such as AI capability, adaptability, trust, operational efficiency, and ethics. This fragmented understanding limits hotel managers' ability to decide which AI functionalities should be prioritized to improve employee performance. In this context, the progress of AI technology is expected to lead to improvements in the performance and to contribute to the efficiency, productivity and effectiveness of employees in executing their tasks.

AI has many benefits including more efficient use of resources, more accurate predictions and more optimal financial and environmental results (Campione, 2026). Nevertheless, it also has challenges. Some of the challenges include elevated costs, complicated installations, data privacy issues, staff pushback, and the need to balance technology and personal service (Paschen et al., 2020; Prentice et al., 2020; Stylos et al., 2021).

Therefore, the aim of this study is to study the impact of different AI related dimensions including operational efficiency, cognitive literacy, and augmented engagement on employees' job performance in Malaysian hotel organizations. The study will also facilitate a better understanding of the role of AI in hospitality and will foster a balanced approach where AI will support the employees rather than replace them (Paschen et al., 2020; Sivarajah et al., 2017; Jabeen et al., 2022). This study also advances the hotel AI literature by moving the focus of the research from customer-oriented outcomes to employee performance, thereby expanding the knowledge of the human side of AI implementation. These findings are anticipated to provide significant theoretical contributions to the body of literature related to AI-empowered workforce performance and offer practical recommendations for hotel managers to leverage the benefits of AI implementation via effective staff development and organizational support.

Literature Review

AI Technology in the Hotel Organisation

AI adoption is crucial today, offering both benefits and challenges for industries such as hospitality (Limna et al., 2021). Since the industry faced strong competition, rising costs, and high guest expectations, advanced technologies are needed to improve customer service and experience while ensuring the survival of businesses in the changing environment (Alhemimah et al., 2024; Hussein et al., 2024; Velwin et al., 2024; Al-Romeedy, 2024). To remain competitive, the hotels used AI technology and robotics to improve customer service and

enhance guest experiences (Al-Romeedy, 2024). The advancement of AI technology in hotels is evident in several examples, including the use of voice assistants to handle simple tasks for hotel staff, thereby boosting employee satisfaction and focus on important guest interactions (Gursoy et al., 2019; Ivanov & Webster, 2019). Other than that, service robots have taken over repetitive jobs, allowing employees to focus on more creative tasks and improving job satisfaction and service quality (Shahzad et al., 2024). However, using more robots may reduce job availability and wages, necessitating new skills and jobs (Acemoglu & Restrepo, 2020). AI also performs complex tasks better than humans through deep learning and could replace some hospitality jobs (Christou et al., 2020). Smart hotels such as Henn-na in Japan and the Alibaba Future Hotel in China use AI, cloud computing, big data, and IoT to improve efficiency and offer personalised, automated services (Northfield, 2015; McCartney & McCartney, 2020). Additionally, AI helps employees make better decisions by analysing customer feedback and preferences, enabling hotels to customise services in real time and thereby improving both staff productivity and guest satisfaction (Kumar, 2021).

Employee Job Performance

Artificial intelligence and other advanced technologies have automated many work processes and have reduced costs in several industries including hospitality (Brougham & Haar, 2018; Bowen & Morosan, 2018; Almada-Lobo, 2015; Hofmann & Rüscher, 2017). AI has transformed the way services are delivered in hotels and increased operational efficiency by automating routine operations such as check-in and check-out through kiosks, virtual assistants and service robots. This enables employees to concentrate on the more complicated and personal parts of their work (Tussyadiah, 2020). AI also helps in activities like inventory management, room service, and client feedback analysis. It provides real-time information about guests and the market to make better decisions (Ivanov & Webster, 2019). Budget hotels are using AI for cost cutting while luxury hotels are using AI for personalizing services and changing staff responsibilities which reduces work stress and increases job satisfaction. AI systems that provide targeted feedback will help to improve employee performance (Tong et al., 2021). The employee attitudes towards AI also influences the performance. Those with positive attitudes tend to perform better while those with negative attitudes may face negative influence on their performance (Taşgit et al., 2023).

Operational Efficiency

A widely acknowledged advantage of AI adoption in the hotel industry is operational efficiency. AI-enabled technologies such as automated check-in and check-out systems, intelligent housekeeping scheduling, robotic process automation, predictive analytics, and AI-driven customer service platforms have the potential to boost operational efficiency by reducing repetitive manual tasks, minimizing human error, and enhancing service consistency (Gretzel et al., 2023; Kang & Baker, 2024). These technologies allow hotel employees to focus less on routine administrative tasks and more on value-added activities that involve interaction, problem-solving, and individual attention to guests. Previous studies have consistently demonstrated positive organizational impacts linked to AI adoption. However, the literature has primarily focused on operational performance from an organizational viewpoint, encompassing cost reduction, service productivity, revenue optimization, and customer satisfaction (Buhalis & Leung, 2018; Mariani & Borghi, 2024). Relatively little research has examined whether improvements in operational efficiency led to better employee job performance. This is an important distinction, because organizational efficiency does not

necessarily mean individual employees are performing well. While artificial intelligence can speed up operations, the real impact on employee performance depends on how well employees can integrate AI output into their daily workflows and decision-making. Recent evidence suggests that AI enhances employee performance through a variety of mechanisms. AI-powered decision tools give personnel real-time operational data so they can respond more quickly and accurately to changing consumer demands. Secondly, predictive analytics improve the scheduling of personnel, housekeeping distribution and inventory management, which reduces unnecessary workload and increases the use of resources. Third, automation alleviates the cognitive load on employees by taking care of tedious administrative tasks, enabling them to focus on complex service interactions that demand creativity and emotional intelligence (Azhar et al., 2025; Huang & Rust, 2022). Operational efficiency should therefore be seen as a work-related asset that improves employee productivity, service quality and overall job performance, as well as an organizational outcome. Nonetheless the link between AI-augmented operational efficiency and employee performance is unlikely to be automatic. Many experts agree that barriers to implementation such as poor digital infrastructure, disjointed data integration, resistance to organizational change, and poor employee training can diminish the effectiveness of AI programs (Mariani & Borghi, 2021; Gajjar, 2023; Mariani & Borghi, 2024). These results suggest that operational efficiency should be regarded as an enabling condition, with benefits only achieved when staff possess the requisite skills to effectively use AI. Hence, investigating the impact of AI operational efficiency on employee job performance offers vital insights into whether technical innovation generates meaningful human performance outcomes in the hotel organizations.

H1: AI operational efficiency has a significant positive influence on employee job performance in hotel organisations.

Cognitive Literacy

The gradual introduction of AI technology into hotel operations has made the cognitive literacy of employees a necessary competence for the optimization of organizational advantages. Cognitive literacy is more than just digital skills and means the ability of employees to understand, analyse, assess and use AI-generated information in their job tasks (Ilieva & Lukanova, 2025). It includes technical skills, analytical thinking, moral awareness and critical thinking. It allows the staff to work efficiently with intelligent systems and ensure the quality of service. There is consensus across the existing hospitality literature that employees' technological proficiency improves AI adoption and technology use (Gursoy et al., 2019; Melián-González & Bulchand-Gidumal, 2020). However, much of the existing research has addressed employee preparation in terms of technology acceptability or digital competences, not enough attention has been paid to cognitive literacy as a complex capacity that influences job performance. This is an important difference, because the employee may be using AI technology without knowing how to analyse, validate, or incorporate AI-generated recommendations into service decisions. Recent research demonstrates that cognitive literacy improves employee performance by increasing decision quality, reducing operational errors, and boosting confidence when working with AI-supported systems (Ilieva & Lukanova, 2025). Employees with high cognitive literacy are better equipped to analyse predictive analytics, handle AI-generated consumer insights, identify algorithmic shortcomings, and consider AI recommendations versus professional judgement. These are especially relevant in hospitality where service encounters require an understanding of context, empathy, and adaptable decision-making that artificial intelligence can't completely replicate. Furthermore, there is a

growing consensus among scholars that cognitive literacy includes ethical considerations of data protection, algorithmic transparency, and responsible AI use. Employees who are aware of the potential and limitations of AI are better able to protect the client trust while delivering personalized services improved by intelligent technologies (Ilieva & Lukanova, 2025). Cognitive literacy is a technological skill and a strategic human skill that allows workers to use artificial intelligence resources to enhance their individual work performance. Understanding this relationship helps to understand how staff competencies influence the effectiveness of AI implementation in hotel organizations.

H2: AI cognitive literacy has a significant positive influence on employee job performance in hotel organisations.

Augmented Engagement

The introduction of AI has changed employee engagement by changing the ways staff interact with technology, organizational processes and hotel guests. AI-augmented engagement is the extent to which intelligent technologies enhance the level of employees' engagement, motivation, collaboration and psychological attachment to their work by supplementing rather than replacing human skills (Mariani et. al., 2022). Prior research on hotels mainly concentrates on AI for client engagement, personalized services and customer experience management (Huang & Rust, 2022; Park et al., 2024). The impact of AI on employee engagement and the subsequent effect on job performance has received relatively little attention. This suggests a major gap in the literature as staff engagement has been consistently identified as a key driver of service quality, innovation, organizational commitment and individual performance in hospitality organizations. Recent research demonstrates a number of mutually reinforcing mechanisms by which AI enhances employee engagement. AI can increase job satisfaction and intrinsic motivation by automating repetitive administrative tasks (Huang & Rust, 2022; Kong et al., 2024), thereby freeing up employees to engage in critical guest interactions and complex service recovery. AI-assisted decision support systems offer personnel with immediate recommendations, predictive insights and real-time operational data, decreasing uncertainty and increasing trust in service decision-making (Helalat et al., 2025). Employees are thus less cognitively overloaded and more psychologically empowered, which both have positive effects on the individual's job performance. However, current evidence suggests that AI- augmented engagement is contingent upon employees' perceptions of fairness, transparency and organizational support. Concerns regarding surveillance and privacy, limited employee autonomy, and over-automation can reduce trust in typical AI systems and negatively impact employee engagement and performance outcomes (Hwang et al., 2022). The mixed findings suggest that AI is not necessarily good for employee performance but rather creates a context that can either promote or hinder employee engagement depending on how AI is adopted and embedded in organizational processes. AI augmented engagement is the central psychological process through which AI adds to staff motivation, service behavior, organizational commitment and work performance in hotel organizations. Therefore, it is important to identify the effect of increased engagement on the job performance of employees in hotel organizations.

H3: *AI augmented engagement has a significant positive influence on employee job performance in hotel organisations.*

The Job Demands-Resources (JD-R) Theory

The Job Demands-Resources (JD-R) Theory proposed by Arnold B. Bakker and Evangelia Demerouti describes the effect of workplace characteristics on motivation, well-being and performance of employees. As per the theory, every employment has unique job demands and job resources. The interaction between both components affects employees' outcomes such as job performance, work engagement, burnout, and organizational effectiveness (Bakker & Demerouti, 2007; Bakker & Demerouti, 2017). The JD-R theory suggests that job demands are the physical, psychological, social or organisational aspects of work that require sustained effort and associated physiological or psychological costs. Examples include heavy workloads, time pressure, complex decision-making, tedious tasks, emotional work. In contrast, employment resources are the aspects of the job that enable individuals to attain work goals, reduce job pressures, develop personally, and increase motivation. Job resources might be organizational support, autonomy, technology aid, training, knowledge, and learning opportunities (Bakker & Demerouti, 2017). As AI is being embedded within hotel operations, AI technologies are transforming into important employment resources rather than only technology tools. AI tools enable staff to automate repetitive operations, accelerate information processing, improve decision-making and optimize service delivery. Thus, AI can lower unnecessary job expectations and at the same time increase people's competencies, which will lead to more work engagement and better job performance. This theoretical perspective makes the JD-R framework particularly useful to explain the impact of AI-related aspects on employee performance in the hotel organizations.

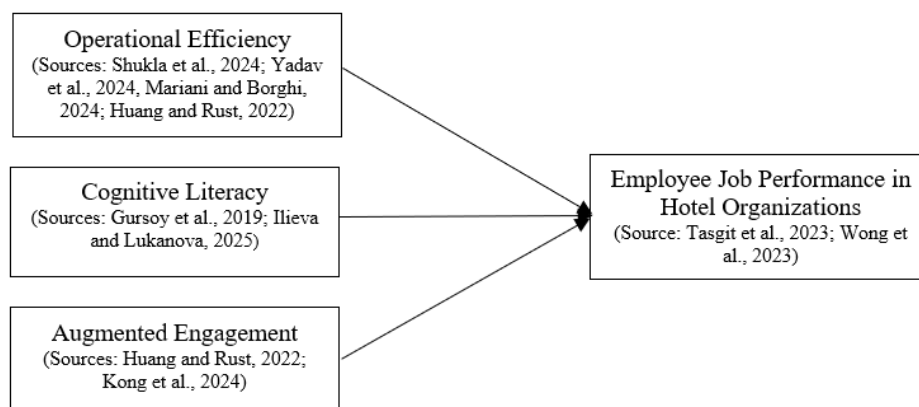


Figure 1: Conceptual framework

Methodology

This study adopted a quantitative, cross-sectional research design to examine the influence of AI technology on employee job performance in the Malaysian hotel industry. A quantitative approach was considered appropriate because it facilitates the empirical examination of relationships among multiple constructs using statistical analyses and enables the testing of the proposed research hypotheses. The study was carried out on employees of hotel organisations in Wilayah Persekutuan Putrajaya, Malaysia. Three hotels purposively selected as they have integrated AI-enabled technologies in their daily operations such as chatbot services, automated check-in/check-out systems and service robots. Following the selection of these organisations, a simple random sampling technique was used to select employees from the participating hotels. This technique was used to ensure that each employee had an equal chance of being

included in the study, thus decreasing possible sampling bias. Based on Krejcie and Morgan's (1970) sample size table, a minimum of 217 respondents was required for a population of 500. This study obtained 225 valid responses, which exceeded the recommended minimum sample size, indicating that the sample was adequate for statistical analysis.

Data were collected through a structured self-administered questionnaire with closed ended questions. To ensure content validity, the measurement items were adapted from the scales previously validated by Helalat et al. (2025); Huang and Rust (2022); and Gursoy et al. (2019). The original meaning of the items was maintained but some minor rephrasing was done to improve clarity and to fit the Malaysian hotel context.

The questionnaire included five sections. Section A collected demographic data from the respondents. Sections B – E assessed the constructs of the study, operational efficiency, cognitive literacy, augmented engagement, and employee job performance. All constructs were assessed using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) with higher scores indicating greater agreement with the statement. Questionnaires were distributed face-to-face and through online surveys (Google Forms) in an effort to enhance accessibility and raise the response rate. Participation was voluntary and respondents were assured of the anonymity and confidentiality of their responses.

The data were analysed using Jamovi version 2.6.26. Before hypothesis testing, the dataset was searched for missing values, outliers, and data-entry errors. Descriptive statistics were calculated to describe the demographic characteristics of the respondents. Further analyses were performed to test for composite reliability, convergent validity and discriminant validity. Finally, inferential statistical analyses were conducted to examine the relationships among operational efficiency, cognitive literacy, augmented engagement, and employee job performance. The analyses included Pearson correlation and multiple linear regression analyses.

Findings and Discussion

Demographic

This survey involved 225 respondents. The demographic profile indicates that the study predominantly included young adults, educated respondents with lower to middle-income levels, primarily employed in the operational department. This gives a representative view of the target community in the research context.

The sample consisted of 122 males (54.2%) and 103 females (45.8%), reflecting a rather equitable gender distribution. Regarding age, the majority of respondents were aged 26–30 years (26.9%), followed by those aged 18–25 years (25.0%), indicating that the hotel workforce primarily consists of young adults. In terms of education, the majority of respondents held a Diploma (36.1%), followed by a bachelor's degree (30.1%), suggesting that the workforce was predominantly well-educated. With respect to monthly income, the highest percentage of monthly income was produced by individuals in the RM2,501–RM3,500 range (29.6%), followed by those earning below RM2,500 (26.9%) and those in the RM3,501–RM4,300 bracket (23.1%). This indicates that the sample was predominantly composed of lower- to middle-income individuals. In addition, the majority of respondents were working in the Food

and Beverage (24.5%), Housekeeping (23.6%), and Front Desk (23.1%) departments, indicating the operational characteristics of hotel employment.

Convergent Validity, Composite Reliability, And Discriminant Validity

The internal consistency of each construct was assessed using Cronbach's Alpha (Table 1), where values exceeding 0.70 indicated acceptable reliability (Hair et al., 2022). The factor loadings for each survey item are presented in Table 2. The analysis revealed that the majority of items demonstrated satisfactory factor loadings above the recommended threshold of 0.50 (Hair et al., 2022), indicating acceptable convergent validity. Although several items exhibited relatively lower loadings (between 0.30 and 0.49), these items were retained because they remained conceptually consistent with their respective constructs and met the minimum acceptable loading for the study's sample size. Harman's single-factor test was conducted to assess the presence of common method bias. The principal component analysis extracted a single factor that accounted for 32.7% of the total variance, which is below the recommended threshold of 50% (Podsakoff et al., 2003). Therefore, common method bias was not considered a significant concern in this study.

Table 1: Reliability Analysis

Variable	Number of Items	Cronbach's Alpha	Relationship
Operational Efficiency	5	0.819	Very good
Cognitive Literacy	6	0.818	Very good
Augmented Engagement	5	0.828	Very good
Employee Job Performance	4	0.819	Very good

Table 2: Adapted Survey Items and Factor Loading

Construct	Survey Item	Factor Loading
Operational Efficiency	AI based systems helps me quickly get access guest preferences and history to offer personalized services.	0.473
	Using AI tools, I can easily use real-time data regarding guest satisfaction and make adjustment accordingly.	0.797
	I feel that AI Technology helps me gather and analyze guest feedback more effectively.	0.414
	I feel that AI Technology helps me gather and analyze guest feedback more effectively.	0.668
	AI systems provide relevant and useful data that enhances the quality of guest interactions.	0.580
Cognitive Literacy	AI Technology systems are helpful in personalizing guest experiences in the hospitality industry.	0.308
	I feel well-prepared to handle AI systems tools, such as chatbot when interacting with the guest.	0.387
	AI significantly reduce human error in managing guest bookings and reservations.	0.689

	I can help predict and manage guest demand more accurately in the hospitality sector.	0.710
	I feel that continuous training is necessary to stay up to date with AI Technology in the hospitality industry.	0.641
	The use of AI in customer services help to create a more efficient work environment for employees.	0.585
Augmented Engagement	The use of AI in our workplace increases my sense of empowerment and autonomy.	0.510
	AI tools help me feel more connected to the organization's goals and values.	0.816
	I feel more confident in my tasks when AI tools support me with real-time feedback.	0.649
	AI technologies make my daily tasks more enjoyable and engaging.	0.630
	Overall, I feel that AI has enhanced my engagement at work.	0.387
Employee Job Performance	The AI system provides accurate and helpful insights into my performance (e.g., guest satisfaction scores, response time, service quality), which help me improve my service delivery.	0.402
	The performance insights from AI have helped me reduce repetitive mistakes in my tasks.	0.561
	I feel motivated to improve when I see my performance data provided by the AI system.	0.600
	I feel comfortable with AI being part of the performance review process.	0.514

Descriptive Analysis

Table 3: Operational Efficiency

No.	Items	Mean	Standard Deviation
1.	AI based systems help me quickly get access to guest preferences and history to offer personalized services.	3.75	0.946
2.	Using AI tools, I can easily use real-time data regarding guest satisfaction and make adjustments accordingly.	3.77	0.839
3.	I feel that AI Technology helps me gather and analyze guest feedback more effectively.	3.74	0.902
4.	AI Technology helps me retrieve critical operational information (e.g: occupancy, guest services) with minimal delays.	3.89	0.859

5. AI systems provide relevant and useful data that enhances the quality of guest interactions. 3.88 0.946

Table 3 indicates that all items possess mean scores exceeding 3.70, indicating that employee predominantly believe that AI technology improves operational efficiency in hotels. The highest mean score, 3.89, pertains to the assertion that AI facilitates the retrieval of essential operational information (including occupancy and guest services) with negligible delay. This indicates that staff appreciate the AI technology for its ability to swiftly retrieve critical data, hence facilitating expedited decision-making and enhancing daily operations. This conclusion underscores that a primary advantage of AI tools is their ability to diminish manual labour and conserve time on repetitive tasks. Furthermore, the second-highest mean score of 3.88 indicates that staff value the enhancement of customer relations facilitated by AI. In general, the consistent responses specify a generally positive perception of AI's role in enhancing hotel operations.

Table 4: Cognitive Literacy

No.	Items	Mean	Standard Deviation
1.	AI Technology systems are helpful in personalizing guest experiences in the hospitality industry.	3.85	0.927
2.	I feel well-prepared to handle AI systems tools, such as chatbot when interacting with the guest.	3.82	0.840
3.	AI significantly reduces human error in managing guest bookings and reservations.	3.78	0.853
4.	AI can help predict and manage guest demand more accurately in the hospitality sector.	3.88	0.872
5.	I feel that continuous training is necessary to stay up to date with AI Technology in the hospitality industry.	3.86	0.848
6.	The use of AI in customer services helps to create a more efficient work environment for employees.	3.95	0.952

According to Table 4, the results demonstrate that staff perceive AI technology as enhancing customer service and overall operations within the hotel industry. The employee asserted that AI enhances workplace productivity, with a mean score of 3.95. This indicates that employees appreciate AI's capacity to alleviate workloads and streamline daily tasks. The ability of AI to accurately predict and manage visitor demand received the second-highest score, 3.88, highlighting its significance for resource management and operational planning. Although item No. 3 showed the lowest score of 3.78, its role in reducing human error in reservation and booking management demonstrates a predominantly positive response.

Table 5: Augmented Engagement

No.	Items	Mean	Standard Deviation
1.	The use of AI in our workplace increases my sense of empowerment and autonomy.	3.84	0.953
2.	AI tools help me feel more connected to the organization's goals and values.	3.88	0.914
3.	I feel more confident in my tasks when AI tools support me with real-time feedback.	3.87	0.964
4.	AI technologies make my daily tasks more enjoyable and engaging.	3.89	1.015
5.	Overall, I feel that AI has enhanced my engagement at work.	3.90	0.971

The overall results in Table 5 reflect the employees' favourable perception of AI technology in the workplace. Item No. 5 exhibited the highest mean score of 3.90. This indicates that the utilisation of AI technologies enhances employee engagement and inspiration in their roles. Furthermore, AI technology positively influences overall employee engagement and job satisfaction, as evidenced by consistently high evaluations in several areas, including increased confidence, alignment with corporate objectives, and enjoyment of activities.

Table 6: Employee Job Performance

No.	Items	Mean	Standard Deviation
1.	The AI system provides accurate and helpful insights into my performance (e.g., guest satisfaction scores, response time, service quality), which help me improve my service delivery.	3.82	0.928
2.	The performance insights from AI have helped me reduce repetitive mistakes in my tasks.	3.77	1.006
3.	I feel motivated to improve when I see my performance data provided by the AI system.	3.85	0.961
4.	I feel comfortable with AI being part of the performance review process.	3.89	0.961

Based on the data in Table 6, employees acknowledged and accepted AI's role in performance evaluations, demonstrating comfort with its inclusion in the evaluation process, as indicated by the highest mean score of 3.89. Moreover, the findings suggested that when employees receive

performance data from AI technology, they are motivated to improve their performance. These studies specify that AI enhances employee confidence, motivation, and performance.

Table 7: Correlation Analysis

Variable	Operational Efficiency	Cognitive Literacy	Augmented Engagement
Employee job performance	0.500	0.593	0.555
Sig. (2-tailed)	<0.001	<0.001	<0.001
N	225	225	225
Strength of relationship	Positive and moderate	Positive and moderate	Positive and moderate

Based on the results displayed in Table 7 above, it has been discovered that there is a positive relationship between all the variables, which are operational efficiency and employee job performance ($r=0.500$, $p<0.001$), cognitive literacy and employee job performance ($r=0.593$, $p<0.001$), and augmented engagement and employee job performance ($r=0.555$, $p<0.001$), suggesting that the strength of all the associations are moderate. Moreover, cognitive literacy demonstrates the strongest positive relationship with employee job performance. These findings suggest that employees with greater AI-related knowledge and understanding tend to exhibit higher levels of job performance. This also implies that employees are likely to perform better in their positions if they have greater comprehension, processing, and application skills. Their overall effectiveness is enhanced by their ability to utilize technology effectively and process information rapidly.

Table 8: Multiple Regression Analysis – Coefficient

Model	Standardized Coefficients Beta	t	Sig.	Decision
Operational Efficiency	0.108	1.53	0.128	Not supported
Cognitive Literacy	0.351	4.80	<0.001	Supported
Augmented Engagement	0.299	4.70	<0.001	Supported

a. Dependent Variable: Employee job performance

Based on the multiple regression analysis, Table 8 represents the coefficients of the independent variables with respect to the dependent variable. The results show that cognitive literacy has the highest predictor of employee job performance ($\beta = 0.351$) followed by augmented engagement ($\beta = 0.299$). This implies that employees who actively use AI technology and possess cognitive skills are more likely to perform better in their jobs. However, operational efficiency was not a statistically significant predictor ($\beta = 0.108$, $p = .128$) if the other variables were controlled. This suggests that the performance of a hotel employee is not directly influenced by the raw speed, automation, or technical smoothness of an AI system.

Table 9: Multiple Regression Analysis – Model Summary

Model	R	R ²	Adjusted R ²	Overall Model Test			
				F	df1	df2	p
1	0.654	0.428	0.420	55.1	3	221	<0.001

Table 9 shows the R-squared value, which is 0.428. Based on this value, it can be anticipated that the independent variables, which are operational efficiency, cognitive literacy and augmented engagement, contribute 42.8% factors to employee job performance. Meanwhile, another 57.2% factors to employee job performance are obtained by other independent variable that was not assessed in this study. These factors may include personal characteristics such as motivation, work experience, emotional intelligence, and personality traits (Robbins & Judge, 2015). According to Hair et al. (2012), because a variety of factors might affect results, R² values can be small in social science research, particularly when it comes to human behaviour. Therefore, even though the model offers valuable insights, it is crucial to recognise that several related variables also influence employee job performance.

Discussion

This study investigated the impact of AI related dimensions - operational efficiency, cognitive literacy, and augmented engagement on employee job performance in hotel organizations. All three dimensions were significantly and positively associated with employee work performance, while only cognitive literacy and augmented engagement were significant predictors in the regression model. The findings suggest that operational efficiency is related to improved employee performance, but its unique contribution is reduced when considering employees' AI competencies and engagement with AI technology simultaneously.

The results showed that cognitive literacy was the strongest predictor of employee work performance among the three variables. The research shows that the ability of employees to understand, interpret and use the AI technology effectively enhances the performance more than the operating skills of the technology only. Hotels are increasingly integrating AI technology in their operations through the deployment of automated check-in systems, chatbot services, intelligent reservation platforms and predictive analytics. Such technologies are useful only when employees have the necessary knowledge and technological literacy to use them well. With high cognitive literacy, workers can read the recommendations generated by AI, solve problems related to technology, make informed judgments and combine the output of AI with professional judgment. In this way, cognitive literacy enhances the ability to solve problems, adapt, provide services and increase work efficiency.

These results are consistent with the Job Demands–Resources (JD-R) Theory, which posits that personal resources, such as knowledge and competences, help individuals to better cope with job demands and improve work outcomes (Bakker & Demerouti, 2017). A key individual attribute, cognitive literacy, empowers employees to adapt to technological advancement in AI-enabled hospitality settings, at the highest level of performance. The findings are aligned with prior research in hospitality and AI, indicating the importance of digital competence and AI literacy for employee performance, creativity and organizational competitiveness (Zhou et al. 2025). Gursoy et al. (2019) noted that the benefits of AI in hospitality rely largely on the ability of the employees to work with intelligent technologies rather than their availability. The present findings thus extend prior findings in hospitality by showing that human competence rather

than technology competence is the mechanism through which AI enhances staff performance.

Moreover, augmented engagement was the second most important predictor of employee job performance. This means that AI tools have a positive effect on employee performance when they augment rather than replace employees' employment. AI tools can help to reduce repetitive administrative tasks, provide real-time data and support decision-making, freeing up people to focus on engaging with consumers and delivering personalized services. The partnership between employee and AI may enhance engagement by reducing workload, increasing confidence, and enabling people to spend more time on high-value jobs (Malik, 2024). Employees do not consider AI to be a substitute for human labour, but rather as an intelligent assistant that augments their capacities. Fidato and Lonardo (2025) proposed that AI and augmented reality technologies can enhance employees' creativity, learning and adaptive behaviour when adapted to enhance human skills.

The present study supports JD-R Theory, where AI is identified as a positive job resource that improves employee motivation and work engagement. Employees who interact with standard AI technology are likely to experience more autonomy, efficiency and confidence, which leads to better job performance. The results confirm recent hospitality literature that human–AI collaboration increases staff productivity and service quality when AI complements rather than replaces human expertise. As the hospitality industry is mainly service-oriented, emotional labour and client interaction are important, hence sustaining staff engagement along with technical advancement is vital for sustainable organizational performance.

In contrast, operational efficiency did not significantly predict employee job performance although it showed a moderate positive link. These results suggest that while AI-enabled operational improvements such as faster service delivery, workflow automation and process optimization improve organizational effectiveness. Such improvements do not necessarily translate into better individual employee performance in light of employees' cognitive literacy and augmented engagement. This finding can probably be explained in a number of ways. Operational efficiency is fundamentally a matter of organizational processes and not of the individual skills of the employees. AI technology can improve operational efficiencies, but personnel are unlikely to improve their performance without sufficient understanding and engagement with the AI technology. Second, the visibility of people's direct contribution to organizational efficiency goes down, as many operational improvements happen automatically by means of AI technology. Ultimately, the success of hotel employees is greatly influenced by interpersonal communication, emotional intelligence, client engagement, and service recovery domains where human skills remain crucial, despite the progress in AI automation. Operational efficiency can also impact staff performance indirectly through increased engagement or improved AI proficiency rather than directly. These results indicate that the successful implementation of AI in hotels is not only about technological investment but also about improving employee skills and fostering good human–AI collaboration. Organizations that only invest in AI technology but do not increase employees' digital competencies and engagement, may not realize the performance gains they are after.

Conclusion

In overall, this study examined the intersection of artificial intelligence and hospitality workforce dynamics. This study explored the effect of operational efficiency, cognitive literacy, and augmented engagement on employee job performance in hotel organization. According to

the Job Demands–Resources (JD-R) Theory, the results demonstrated that the human component, especially cognitive readiness and systemic involvement of employees, creates value from AI. Nevertheless, it was cognitive literacy that was the main driver of performance, followed by augmented engagement that was also an important factor. However, operational efficiency had no direct significant impact. This demonstrates that technology infrastructure alone does not drive higher performance. The success relies on the employees' knowledge and confidence to use these tools daily.

This study theoretically contributes to the JD-R model for the hospitality's digital age. It defines cognitive literacy as an important personal resource to cope with the demands of technology and categorizes augmented engagement as a positive job resource that enhances human–AI collaboration. The study also changes the perception of AI from a static operational tool to a dynamic organizational asset. It also feeds much needed empirical data to the discourse surrounding technology and labour in the Malaysian hospitality scene.

The findings have a number of practical implications for hotel operators. More and more, managers need to prioritize continuous skills development, with an added emphasis on developing digital capabilities and critical thinking skills. To help make the transition smoother and ease employee worries about adopting new technology, human resource departments need to incorporate AI readiness into the entire employee lifecycle starting from hiring to training and performance management. Operations managers in the field need to design workflows that allow AI to take over routine activities, so human staff can focus on personalized guest service and emotional intelligence. Furthermore, in an effort to ensure that AI is an enabler and not an administrative burden, technology buyers need to select simple tools that can be easily integrated into current procedures.

Apart from that, this study also has intrinsic limitations. The focus on Putrajaya geographically means that the findings are not immediately relevant to other areas or types of hotels in Malaysia. The use of cross-sectional, self-reported data does not allow definitive proof of causality, and the model allows for the influence of unmeasured individual or cultural variables. Future research should build on this foundation with larger, more diverse samples in multiple states and categories of hotels. Longitudinal frameworks would provide more insight into how employees adapt to AI over time. Also, by observing factors such as AI trust, change management techniques and leadership behaviour, there will be a better idea on how the global hospitality business can work effectively with changing technology.

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- Ethics Statement:** This study was conducted in accordance with ethical research standards for studies involving human participants. All procedures involving human participants were reviewed and approved by the Jawatankuasa Penyelidikan Negeri (JPN), UiTM Cawangan Terengganu, with Minimal Risk approval granted through JPN Meeting Bil. 08/2025 held on 8 May 2025. The approval reference number is 100-UiTMCTKD (PJI.23/4) JPN. Informed consent was obtained from all participants prior to data collection. Participation was voluntary, and respondents were assured of confidentiality and anonymity. The data collected were used solely for academic purposes.
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