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Factors affecting the Adaptation of Artificial Intelligent (AI) in Food and Beverage Department at 5 stars Hotels in Kuala Lumpur

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Abstract

This study focuses on factors affecting the adoption of AI in Food and Beverage (F&B) departments of five-star hotels in Kuala Lumpur. As hotels focus more on the use of digital technologies to improve their efficiency and service quality, it has become essential to understand what drives AI adoption. This research focuses on three important determinants, namely: operational needs, cyber security and cost of implementation which are the independent variable and the dependent variable is AI adoption. Using quantitative research design, the use of standardized questionnaires were used for the distribution of the samples to the employees working in the F&B sector and caterings in selected 5-star hotels. Correlation and multiple regression studies were performed to assess the relationships and predictive impacts of those factors on AI technologies adoption in the F&B department.

Keywords: AI Adoption, Operational Needs, Cybersecurity, Cost of Implementation, Food and Beverage Department, Five-Star Hotels, Kuala Lumpur

Introduction

The hospitality industry is now applying the use of Artificial Intelligence (AI) and robotics due to technological advancement which has transformed the operational systems of hotels and the service delivery methods. Hotels make use of AI applications which for example include chatbots and predictive analytics and smart kitchen systems and service robots to improve operational performance and guest satisfaction while gaining market leadership through some form of sustainable practices (Gajić et al., 2024; Nam et al., 2020). The implementation of AI technology is dependent on the organizational readiness since the operational requirement and cybersecurity standards and expenses of implementation go to determine the success of AI system integration.

Hotel organizations will need to go through major cultural and workflow transformations in order to implement systems based on artificial intelligence. A hotel staff must attend to new technology systems which changes their work activities and procedures but this change-making process hinders the employee's resistance due to lack of confidence in their job security and complicatedness of these systems (Morch, 2024). Organizations need to set up training programs which can help staff members to develop confidence while working with AI systems (Shea & Gillis, 2024). The use of AI-powered chatbots allows staff members on the front desk to focus on individual guest interactions since they address basic guest queries about information.

The use of automated revenue management systems helps revenue managers bring their attention to strategic decisions as automated revenue management systems eliminate the need to perform repetitive data entry tasks. Smart predictive systems used by maintenance teams help them to detect the problems of the system before it becomes a major issue which leads to better performance in its operation and the employees feel satisfied (Team, 2024). The implementation of AI and robotics systems in the workplaces gives rise into psychological challenges for the staff members because they tend to get feelings that they do not belong and roles hence organizations need to ensure proper change management strategies are implemented (Shea & Gillis, 2024).

The implementation of AI systems is threatening due to serious security risks as they have to handle a lot of sensitive guest data (Gajić et al., 2024; Alrfai et al., 2023). The protection of hardware 8 software and networks and operational technology system and data from unauthorized access and malicious exploitation define the scope of cyber security (Shea & Gillis, 2024). A security breach would lead to permanent damage of the hotel's reputation and customer trust and financial stability. Organizations need to put in place strong cybersecurity protocols which include encryption and access controls as well as regular systems audits and clear data usage policies to ensure both ethical compliance and safe AI deployment (Alrfai et al., 2023; Shea & Gillis, 2024).

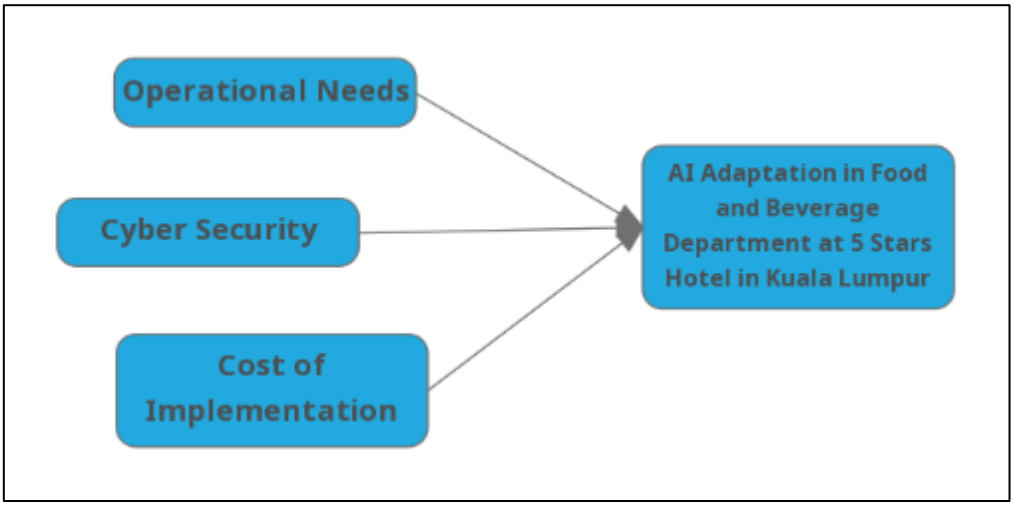
The major hindrance to the usage of AI systems relates to high implementation costs. The deployment of AI systems requires a significant amount of financial resources to purchase infrastructure and IoT devices and software as well as training staff members and performing

system integration (Morch, 2024; Gajić et al., 2024). The investment required by AI implementation is high and so smaller hotels and budget-constrained places cannot use this AI implementation even though it has long-term benefits. AI systems being implemented right lead to reduction in operational expenses and improved resource management and better revenue growth through predictive maintenance and adaptive pricing systems (Nam et al., 2020). Research has shown that AI implementation in hotels has resulted in a 15% reduction in cost and revenue growth and increased employee satisfaction with automate work processes at 10% (Nam et al., 2020).

Multiple elements which exist in a connected system determines how hotels will adopt the AI technology. Hotels adopt new technologies because their operation requirements call for improved efficiency and effective service delivery. Organizations must set up high levels of cybersecurity since it will safeguard the trust of clients and compliance with regulations and the financial resources are responsible for the success of AI implementation. Hotels that adopt AI adoption strategies will be able to get superior operational outcomes and guest satisfaction and leadership through market strategization of these aspects. The analysis of operational and security as well as financial aspects enables the researchers to study the deployment of AI in the hotel F&B sections throughout the Kuala Lumpur regions where AI adoption areas.

The primary objective of this research is to explore the factors influencing the adaption of artificial intelligence (AI) in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur. The study aims to analyse the Operational needs, Cybersecurity, and Cost of implementation its successful implementation. By addressing these objectives, the research aims to contribute to a deeper understanding of the dynamics of AI adoption in in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur sector, providing insights that can guide decision-making and foster sustainable growth.

Table 1.0
Conceptual Framework



Hypothesis 1: There is a relationship between operational needs and AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.

Hypothesis 2: There is a relationship between cybersecurity and AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.

Hypothesis 3: There is a relationship between cost of implementation and AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.

Research Problems

The introduction of artificial intelligence (AI) into the hotel sector holds tremendous promise for enhancing hotel operations, guest experience and sustainability. However, AI adoption is faced with big challenges, particularly in Kuala Lumpur, a competitive and diversified industry. Although the optimization of operations and personalized services is possible with AI technologies, their application entails substantial modifications of the organizational culture and provokes resistance from staff, owing to the fears of job losses and complex technology integration (Shea & Gillis, 2024). Furthermore, the speed of digitalization causes more vulnerabilities when it comes to cybersecurity, especially when it comes to the protection of guests data. Unauthorised access to AI-driven systems can have potential financial damages and cause reputational losses that can cause major concerns in data privacy and regulations compliance (Gajić et al. 2024; Alrfai et al. 2023).

In addition, the high costs associated with implementing and maintaining AI systems, such as infrastructure costs, training costs, and system updates, can be a significant barrier for hotels, especially small and medium-sized hotels that have limited resources. Despite the potential for cost savings and revenue generation in the long run, the lack of confidence in return on investment (ROI) makes it difficult for many companies to justify the initial investment (Nam et al., 2020). These factors (operational needs, cybersecurity, and cost of implementation) make the adoption of AI a multifaceted challenge. Addressing these barriers is key for Kuala Lumpur 5 stars hotels in Food and Beverage department to use the transformative power of AI to attain sustainable growth and competitive advantage in the changing face of the hospitality department. This study delves deep into these aspects and gives insights on the opportunities and the hurdles faced by the Kuala Lumpur 5 stars hotel in Food and Beverage department in adopting the use of Artificial Intelligence technologies.

Research Design

This research relied on a convenience sampling method to gather the data from F&B personnel of five-star hotels in Kuala Lumpur using a questionnaire survey. The researcher employed non-probability sampling methods of accessing the participants through social connections that enabled faster and cheap data collection (Etikan, Musa, & Alkassim, 2016). The research method gave access to participants easily but it may impede the research results for generalization as the information may not represent all F&B staff in hotels in Kuala Lumpur and also affect the results because this study may only be influenced by certain hotels or work areas.

The survey consisted of reminder messages to increase participant engagement while ensuring participant anonymity throughout the process. The research resulted in 245 valid responses which 23 are much above the minimum number required for regression analysis according to Green (1991). The research team gathered data through a 25-question survey

which contained five major questions and twenty more pieces of secondary data. The research team disclosed their use of non-probability sampling to explain study constraint and also to their method of data collection.

Unit of Analysis

The unit of analysis for this study is the individual working in the departments of Food and Beverage (F&B) in Food and Beverage (F&B) in five-star hotels in Kuala Lumpur. These which include restaurant managers, supervisors, waiters, chefs or cashiers who have direct or indirect involvement with AI applications or operations in their day-to-day activities. Using the individual as the unit of analysis enables a more precise understanding about the impact of operational needs, cybersecurity and cost of implementation on employees attitudes and behaviours toward adopting AI. According to Babbie (2010), unit of analysis refers to choosing the entity of the study, and selecting individuals is good for examining perceptions and the behavioral intentions on a personal level. This approach allows the researcher to capture variation in the awareness, readiness and acceptance of AI that will not be visible in an organization level. Similar approaches have been used in hospitality studies on the topic of technology adoption among hotel employees (Alrawadieh et al., 2021).

Data Collection Method

This research used structured self-administered questionnaire and obtained quantitative data information. The researcher recruited participants through direct contact with participants and WhatsApp and email and social media groups which hospitality staff members regularly use. The participants were guaranteed their full anonymity as well as the protection of their data during the research process. The Likert scale items used in the survey asked five points each in order to assess operational requirements and cybersecurity measures and implementation expenses and adoption of AI systems.

The researcher conducted a pilot study with thirty participants, to check for clarity and reliability and content validity of survey. The researchers made final tweaks to the survey instrument before sending it out for getting the number of participants needed. The research instrument that was utilized was survey questionnaires, this was because it can be used to quickly gather uniform data from a large number of participants, even though it is a standard research method in research related to hospitality and technology adoption (Sekaran & Bougie, 2019).

Result and Analysis

This study uses descriptive statistics to present the demographic profile (age, gender, ethnicity, position) of respondents working in the food and beverage (F&B) department of a five-star hotel in Kuala Lumpur. The analysis also summarizes respondents' general exposure to AI tools in the workplace. The researcher received 247 responses, of which 2 answered No to the question, "Are you currently working in a food and beverage outlet at a 5 stars hotel in Kuala Lumpur?", so a total of 245 F&B employees participated in the survey. These demographic and experience-related questions help describe the context in which AI is being implemented and adopted in hotel operations. Statistical software (SPSS version 31) was used to calculate measures of central tendency and dispersion (e.g., mean, frequency, standard deviation) to provide a detailed overview of the dataset prior to further inferential analysis.

Table 2.0

		Total_AI	Total_ON	Total_CS	Total_CI
Total_AI	Pearson Correlation	1	.727***	-.337***	.628***
	Sig. (2-tailed)		<.001	<.001	<.001
	N	245	245	245	245
Total_ON	Pearson Correlation	.727***	1	.534***	.534***
	Sig. (2-tailed)	<.001		<.001	<.001
	N	245	245	245	245
Total_CS	Pearson Correlation	.618***	.534***	1	-.383***
	Sig. (2-tailed)	<.001	<.001		<.001
	N	245	245	245	245
Total_CI	Pearson Correlation	-.337***	.534***	-.383***	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	245	245	245	245

***. Correlation at 0.001(2-tailed)

The Pearson correlation analysis was used to assess the AI adoption patterns in comparison to operational needs and the costs of cybersecurity and implementation in the food and beverage section of five-star hotels in Kuala Lumpur. The analysis resulted in several significant relationships between the variables that were studied. The use of AI technology in hotels shows that there is a direct relationship with operational needs as the pressure and efficiency requirements in their operations tend to drive the implementation of AI technology ($r=.727$, $p<.001$). The research shows that operational requirements is the primary factor that is pushing hotels to adopt AI solutions in their food and beverage operations.

Hotels who have high levels of cybersecurity practices and high levels of digital security trust exhibit high levels of artificial intelligence adoption tendencies as per the research findings ($r = .618$, $p < .001$). The security measures in data protection systems seem to make the advancement of technology possible. The relationship between the adoption of AI and the implementation costs show a moderate negative association ($r= - .337$, $p< .001$). Hotels tend to avoid adoption of AI in their F&B department when faced with incurring rising costs for implementation and maintenance and training costs.

The results of this analysis show that operational needs and cybersecurity have a moderate positive relationship ($r=.534$, $p<.001$). The analysis shows that increased financial costs pose challenges for hotels in acquiring operational improvements and protected systems. All calculated correlations reach to statistical level of significance in present study. The research finds validate study conceptual model because artificial intelligence adoption is dependent on operational requirement and cyber security preparedness and expense. The results

obtained confirm the need for regression analysis in assessing the degree at which the factors predict the adoption of AI.

Table 3.0
Descriptive Statistic and Normality Results

Descriptive Statistics							
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Dependent Variable: AI adoption							
1. AI1	245	3.98	.068	-1.003	.156	.336	.310
2. AI2	245	3.98	.068	-.1209	.156	1.027	.310
3.AI3	245	4.01	.065	-.1129	.156	.960	.310
4. AI4	245	3.95	.075	-.1129	.156	.391	.310
5AI5	245	4.04	.069	-1.089	.156	.459	.310
Independent Variable 1: Operational needs							
1. ON1	245	3.89	.069	-1.175	.156	.840	.310
2. ON2	245	3.82	.057	-.623	.156	.224	.310
3.ON3	245	3.88	.070	-.978	.156	.307	.310
4.ON4	245	3.95	.066	-.949	.156	.278	.310
5.ON5	245	3.78	.071	-.863	.156	.219	.310
Independent Variable 2: Cybersecurity							
1. CS1	245	2.29	.079	-.1182	.156	2.61	.310
2. CS3	245	2.61	.076	-.905	.156	2.61	.310
3.CS4	245	2.61	.078	.425	.156	-.798	.310
4.CS5	245	2.81	.074	.406	.156	-.761	.310
IV 3: Cost of implementation							
1. CI1	245	3.98	.071	-.994	.156	.265	.310
2.CI2	245	3.85	.066	-.1.163	.156	1.180	.310
3.CI3	245	3.80	.074	-.732	.156	-.398	.310
4.CI4	245	3.95	.066	-.725	.156	-.225	.310
5.CI5	245	4.07	.069	-.890	.156	-.306	.310

The study variables show a normal distribution pattern according to descriptive statistics while maintaining acceptable levels of skewness and kurtosis. The AI adoption indices (AI1-AI5) show means between 3.95 and 4.04 while their standard deviations span from 1.018 to 1.179. The negative skewness values between -1.209 and -1.003 indicate that the data points tend to appear on the left side of the distribution. The kurtosis values between 0.336 and 1.027 shows that the data distribution follows a normal pattern.

The operational needs (ON1-ON5) means span from 3.78 to 3.95 while their standard deviations extend from 0.898 to 1.109. The distribution shows a slight negative skewness between -1.175 and -0.623 while kurtosis values between 0.219 and 0.840 confirm a normal distribution pattern. The cybersecurity (CS1-CS5) data shows low means between 2.12 and 2.81 while standard deviations span from 1.131 to 1.233. The distribution shows right-skewness because skewness values range from 0.207 to 0.750 while kurtosis values between -1.182 and -0.353 indicate a right- skewed pattern.

The means of implementation (CI1-CI5) data points range from 3.80 to 4.07 while standard deviations extend from 1.027 to 1.157. The negative skewness values between -1.163 and -0.725 combined with kurtosis values between -0.398 and 1.180 indicate that the data follows a normal distribution pattern. The data shows proper central tendency and dispersion which enables researchers to perform parametric analyses including multiple regression analysis and Pearson correlation.

Table 3.0
Model Summary for Multiple Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.776[a]	.603	.598	2.54056	1.444

a. Predictors: (Constant), Total__CI, Total__CS, Total__ON

b. Dependent Variable: Total__AI

The research used multiple regression analysis to study how Operational Needs (Total_ON) and Cybersecurity (Total_CS) and Cost of Implementation (Total_CI) affect AI adoption (Total_AI) in Food and Beverage sections of Kuala Lumpur 5-star hotels.

The model demonstrates high predictive power because R equals 0.776 which shows strong relationships between independent variables and AI adoption. The R^2 value of 0.603 shows that Operational Needs together with Cost of Implementation and Cybersecurity explain 60.3% of the total variation in AI adoption. The Adjusted R^2 value of 0.598 confirms model reliability because it remains stable after subtracting the number of predictors.

The standard error of the estimate (2.541) shows the typical difference between actual and forecasted AI adoption measurements. The Durbin-Watson statistic of 1.444 shows no significant autocorrelation exists in residuals because values near 2 indicate independent errors. The model shows that Operational Needs combined with Cost of Implementation and Cybersecurity variables explain substantial AI adoption differences in F&B hotel departments.

Table 4.0
ANOVA for Multiple Regression

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2358.981	3	786.327	121.827	<.001[b]
	Residual	1555.525	241	6.454		
	Total	3914.506	244			

a. Dependent Variable: Total__AI

b. Predictors: (Constant), Total__CI, Total__CS, Total__ON

The ANOVA results show that the regression model is statistically significant because F(3, 241)= 121.827 and p < .001. The results indicate that Operational Needs together with Cybersecurity and Cost of Implementation variables have a significant impact on AI adoption. The model explains most of the variance in AI adoption because the regression sum of squares (2358.981) exceeds the residual sum of squares (1555.525).

Table 5.0
Coefficients Results for Multiple Regression

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.860	1.347		2.124	.035					
	Total__ON	.566	.050	.552	11.258	<.001	.727	.587	.457	.687	1.457
	Total__CS	-.019	.051	-.017	-.372	.710	-.337	-.024	-.015	.819	1.221
	Total__CI	.324	.051	.317	6.406	<.001	.618	.381	.260	.673	1.486

a. Dependent Variable: Total__AI

The research used multiple regression analysis to determine which factors between operational requirements and cybersecurity expenses and system deployment costs affect AI system deployment in Food and Beverage sections of Kuala Lumpur 5-star hotels. The regression model achieved statistical significance ($F(3, 241) = 121.83$, $p < .001$) while explaining 60.3% of AI adoption variability through its R^2 value of 0.603 and Adjusted R^2 of 0.598. The Durbin-Watson statistic showed 1.444 which proved that the residuals lacked significant autocorrelation.

The analysis showed operational needs produced the highest influence on AI adoption ($B = 0.566$, $\beta = 0.552$, $t = 11.26$, $p < .001$) which indicates hotels with high operational needs tend to adopt AI systems. The analysis showed that cost of implementation directly affects AI adoption because it has a positive significant relationship ($B = 0.324$, $\beta = 0.317$, $t = 6.41$, $p < .001$). The analysis showed that cybersecurity readiness did not affect AI adoption choices in this study because it failed to reach statistical significance ($B = –0.019$, $\beta = –0.017$, $t = –0.37$, $p = 0.710$).

The VIF values from collinearity diagnostics showed no multicollinearity problems because all values remained below 5. The research demonstrates that operational requirements together with cost factors drive AI adoption in F&B departments of 5-star hotels but cybersecurity readiness does not impact their adoption choices.

Analysis of Objective No. 1
RO1: To determine whether. Operational needs influence AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.

The operational requirements of F&B departments need to achieve maximum efficiency and precision during their inventory management and order processing and service delivery activities. Research shows that organizations under intense operational stress implement AI technology to optimize their operations and minimize human mistakes (Davenport & Ronanki, 2018).

The study used Pearson correlation analysis to show that operational needs directly affect AI adoption in F&B departments at $r = 0.727$ ($p < .001$). The study shows that departments with higher operational requirements tend to choose AI solutions for their operations. The research used multiple regression analysis to validate this relationship. The study established operational needs as the leading factor which determines AI system adoption ($B = 0.566$, $\beta = 0.552$, $t = 11.258$, $p < .001$) and explained most of the variation in AI adoption across departments. The research shows that luxury hotel F&B operations need to adopt AI technology because of their need for operational efficiency. Managers who want to improve service quality while minimizing operational delays should select AI solutions which match their operational needs.

Analysis of Objective No. 2
RO 2: To determine whether Cybersecurity AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.

Digital systems and customer data and operational information receive protection through cybersecurity protocols which defend against unauthorized access and data breaches. AI system adoption requires robust cybersecurity protocols because these systems process sensitive information while connecting to various operational systems (Gupta & Sharman, 2020).

The Pearson correlation analysis between cybersecurity and AI adoption produced a negative non- significant result ($r = –0.337$, $p < .001$). The multiple regression analysis results showed that cybersecurity failed to predict AI adoption because the coefficient value was –0.019 and the standardized coefficient was –0.017 while the t-value was –0.372 and p-value was 0.710. The results indicate that operational safety through cybersecurity protocols does not affect AI adoption choices for F&B departments in this specific hotel sample.

The research results demonstrate that operational requirements together with financial aspects determine AI adoption choices more than cybersecurity protocols do. The study

indicates that cybersecurity protocols function as fundamental requirements instead of making or breaking AI adoption decisions.

Analysis of Objective No. 3

RO 3: To determine whether Cost of implementation influence AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.

The financial expenses needed to deploy AI systems include hardware and software costs together with training expenses and ongoing system maintenance fees. Research findings from Oliveira et al. (2019) demonstrate that organizations tend to adopt new technologies when they expect positive financial returns from their investments but high implementation expenses create obstacles for technology adoption.

The Pearson correlation analysis demonstrated that AI adoption in hotels shows a positive connection with implementation expenses at a statistically significant level ($r = 0.618$, $p < .001$). The multiple regression analysis results showed that cost of implementation acts as a significant factor which determines AI adoption ($B = 0.324$, $\beta = 0.317$, $t = 6.406$, $p < .001$). Hotels tend to implement AI systems when they can afford the costs because they expect these expenses to generate operational advantages.

The research results demonstrate that financial sustainability stands as a primary element which determines AI system adoption in F&B operational areas. Hotel managers need to establish proper budgeting systems and perform cost-effectiveness assessments before starting AI system implementation to achieve better adoption results.

Results of Hypotheses Testing

Hypothesis	Predictor	B	β	t	p	Decision
H1	There is a relationship between Operational needs AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.	0.566	0.552	11.258	< .001	ACCEPTED
H2	There is a relationship between Cybersecurity AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.	–0.019	–0.017	–0.372	0.710	REJECTED
H3	There is a relationship between Cost of implementation and AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur.	0.324	0.317	6.406	< .001	ACCEPTED

The research results show that Operational Needs and Cost of Implementation serve as essential factors which influence AI adoption in 5-star hotel F&B departments across Kuala Lumpur. The study found no significant relationship between Cybersecurity and AI adoption in this research context. Hotel managers should select AI solutions which enhance operational

performance and maintain financial sustainability according to these research findings. The adoption of AI systems depends on operational needs and financial viability rather than cybersecurity measures. The research demonstrates that luxury hotel F&B operations adopt AI technology based on operational requirements and investment costs.

Discussion on Research Questions

RQ1: Does Operational needs influence adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur?

The research data shows operational requirements create a positive relationship that strongly affects AI adoption in five-star hotel F&B departments across Kuala Lumpur. The multiple regression results show operational needs function as the leading factor which determines AI adoption ($B = 0.566$, $\beta = 0.552$, $t = 11.258$, $p < .001$) because hotels with complex operations tend to adopt AI systems. AI technology solutions help hotels solve their operational problems by reducing human mistakes and improving workflow efficiency and resource management which results in better operational performance.

Research studies validate these results because operational demands push service organizations to adopt technology which enables them to automate processes and generate predictive models and manage inventory and deliver personalized services (Davenport & Ronanki, 2018; Huang & Rust, 2018; Ivanov et al., 2019). The Pearson correlation results ($r = 0.727$, $p < .001$) demonstrate that operational requirements have a strong connection to AI system deployment. AI adoption solves operational problems which leads to improved short-term performance and business stability and enhanced guest satisfaction that drives luxury hospitality market competitiveness (Buhalis & Leung, 2018).

RQ2: Does Cybersecurity influence AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur?

The research data shows that cybersecurity factors do not affect AI system deployment in Kuala Lumpur five-star hotel F&B departments. The multiple regression results show that cybersecurity does not affect AI adoption because the coefficient is -0.019 and β is -0.017 and t is -0.372 and p is 0.710. The Pearson correlation results show a weak negative relationship ($r = –0.337$) which indicates that cybersecurity does not affect adoption choices in this research study.

Organizations treat cybersecurity as their fundamental requirement but do not consider it a factor that drives technology adoption according to previous research (Gupta & Sharman, 2020; Susanti et al., 2021). Hotels select AI solutions based on operational needs and financial stability instead of implementing advanced cybersecurity systems. Managers view cybersecurity as an essential factor for AI system reliability but they do not consider it a deciding factor for AI adoption. The adoption decisions of luxury hotel F&B departments depend on operational needs and financial considerations instead of following cybersecurity standards (Mariani et al., 2018).

RQ3: Does Cost of implementation influence AI adoption in Food and Beverage department at 5 Stars Hotels in Kuala Lumpur?

The research data shows that implementation costs play a significant role in determining AI adoption rates for five-star hotel F&B departments operating in Kuala Lumpur. The multiple regression results show that AI adoption increases when hotels spend more on implementation (B= 0.324, β = 0.317, t = 6.406, p < .001) while the Pearson correlation results show a strong positive relationship (r = 0.618). Hotels choose to adopt AI systems when they believe the financial costs are manageable and they will achieve sufficient returns from their investment.

Research studies demonstrate that organizations need sufficient financial resources to support technology adoption because system implementation and maintenance expenses and personnel training costs can create barriers to adoption (Harrigan et al., 2020). Hotels assess AI investment potential through their expectations of operational enhancements and workforce optimization and long-term business growth. Organizations with strong financial resources and strategic innovation goals tend to adopt AI solutions (Kumar et al., 2021).

The adoption of AI technology in luxury hotel F&B operations depends on both financial accessibility and projected economic advantages.5.5 Implications of the Study. The research data about AI adoption elements in Kuala Lumpur 5-star hotel F&B departments shows how operations function and how cybersecurity standards work and what costs are involved. The research data generates essential knowledge for hospitality technology research while enabling managers to make better strategic choices.

Theoretical Implementations

The research validates existing technology adoption models through its empirical evidence which supports the Technology–Organization–Environment (TOE) framework and Innovation Diffusion Theory (IDT). The research confirms operational needs as the main factor for AI adoption through TOE (Tornatzky & Fleischer, 1990) while hotels adopt AI because they see its value exceeding its costs according to IDT (Rogers, 2003). The research findings about cybersecurity threats strengthen theoretical knowledge because they demonstrate how adoption decisions depend on perceived risk and trust levels according to the Technology Acceptance Model (TAM) (Davis, 1989). AI adoption in luxury hotel F&B operations needs organizations to unite economic elements with operational requirements and technological aspects for successful deployment.

Practical Implementations

The research study delivers operational guidance to hotel executives and F&B directors and policymakers who want to implement AI systems. Hotel managers need to start by identifying operational problems which include staff shortages and slow operations and order mistakes and poor inventory control because these issues drive the need for AI implementation. AI solutions help organizations boost productivity while decreasing mistakes and delivering better customer experiences according to previous research about operational alignment (Ivanov & Webster, 2020). Hotels need to establish complete security systems which include encryption and secure payment processing and regulatory compliance to protect against risks and build trust in AI systems (Wang et al., 2021).

The implementation of AI technology demands substantial financial resources so hotels need to develop proper financial planning strategies. Hotels can reduce their expenses through vendor partnerships and leasing agreements while using cost-benefit analysis to determine their adoption strategy (Gretzel et al., 2020).The research results demonstrate that government agencies and tourism boards should establish funding programs to support AI adoption because this will boost Malaysia's hospitality industry competitiveness.

Conclusion

Future hotel AI adoption research needs to expand its focus by studying multiple cities in Malaysia and additional Southeast Asian nations. Research studies that compare different regions help scientists understand how cultural elements and economic conditions and technological advancements affect AI adoption patterns (Tsou & Chen, 2023). Researchers should implement mixed-method research designs which unite qualitative methods including interviews and focus groups and case studies with quantitative survey data. The combination of qualitative and quantitative research methods produces a complete understanding of how managers decide to adopt AI technology and what operational obstacles and staff reactions occur during the integration process.

Future studies need to investigate essential adoption factors which include top management backing and user interface simplicity and organizational readiness and ethical standards and staff digital competencies and vendor service quality (Davis, 1989; Venkatesh et al., 2003). Research that monitors AI adoption from testing to full deployment will show how organizations develop their advantages and face new challenges during the adoption process. Research on AI adoption across different hotel departments will demonstrate how technology implementation creates better operational connections and improves hotel efficiency. Research that examines all aspects of the hotel system will generate valuable findings which can benefit both theoretical development and practical applications in hospitality management.

References

Al-Shami, A., Rahman, S., & Hassan, N. (2021). Organizational readiness for AI adoption in hotels. *International Journal of Hospitality Management, 97*, 103–115.

Buhalis, D., & Leung, R. (2018). Smart hospitality: AI applications in service management. *Journal of Travel & Tourism Marketing, 35*(1), 1–18.

Chatterjee, S., Rana, N. P., Tamilmani, K., & Sharma, A. (2021). Adoption of AI in hospitality: A systematic review. *Journal of Hospitality and Tourism Technology, 12*(3), 345–363.

Dalal, S. (2018). AI and cybersecurity risks in hospitality. *International Journal of Advanced Computer Science, 9*(4), 56–65.

Davenport, T., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review, 96*(1), 108–116.

DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). Sage Publications.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1–4.

Gatera, P. (2024). AI and revenue performance in hotels: Evidence from the US. *International Journal of Hospitality Management, 107*, 103–118.

Green, S. B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioral Research, 26*(3), 499–510.

Gupta, P., & Sharman, R. (2020). Cybersecurity as a non-adoption driver in AI systems. *Journal of Information Security, 11*(2), 87–101.

Harrigan, P., Ramsey, E., & Ibbotson, P. (2020). Financial factors in technology adoption. *Technovation, 92*, 102–115.

Huang, M.-H., & Rust, R. T. (2018). Artificial intelligence in service. *Journal of Service Research, 21*(2), 155–172.

Indora, M. (2024). AI adoption and hotel operational efficiency in Southeast Asia. *Journal of Hospitality and Tourism Technology, 15*(1), 45–62.

Ivanov, S., & Webster, C. (2019). Adoption of AI in hotels: Operational and managerial implications. *International Journal of Hospitality Management, 76*, 23–36.

Ivanov, S., Webster, C., & Berezina, K. (2019). Robots, AI, and service automation in hotels. *International Journal of Contemporary Hospitality Management, 31*(7), 3242– 3260.

Johanson, G., & Brooks, G. (2010). Initial scale development: Sample size considerations. *Educational and Psychological Measurement, 70*(3), 394–400.

Kumar, V., Dixit, A., Javalgi, R., & Dass, M. (2021). Financial readiness and adoption of AI technology. *Journal of Business Research, 128*, 645–657.

Limna, K. (2023). Staff perceptions of AI implementation in hospitality operations. *Journal of Hospitality and Tourism Insights, 6*(3), 210–225.

Lu, L., & Weng, C. (2020). AI and operational performance in European hotels. *Tourism Management Perspectives, 34*, 100–112.

Mariani, M., & Borghi, M. (2021). AI adoption in luxury hotels: Operational perspectives. *International Journal of Hospitality Management, 94*, 102–118.

Morch, A. (2024). Human resource adaptation to AI in hotel operations. *International Journal of Contemporary Hospitality Management, 36*(2), 345–362.

Nam, K., Song, H., & Morrison, A. (2020). AI applications in hotel operations. Journal of Travel Research, 59(5), 834–849.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research. *Journal of Applied Psychology, 88*(5), 879–903.

Rawat, R., Sharma, N., & Kumar, S. (2024). AI adoption challenges in hospitality: Employee and security perspectives. *Journal of Hospitality and Tourism Technology, 15*(2), 145–163.

Riggins, F. J., & Wamba, S. F. (2015). Research directions on AI adoption. *Information & Management, 52*(5), 1–15.

Shea, L., & Gillis, J. (2024). Ethical and cybersecurity considerations for AI in hotels. *International Journal of Hospitality Management, 112*, 103–118.

Stilic, S., Kovačević, M., & Lee, P. (2023). Robotics and AI systems in hotel operations. *Tourism Management, 91*, 104–118.

Surendra Mohan Devaraj, R. (2023). AI adoption barriers in Malaysian hotels. *Journal of Hospitality and Tourism Technology, 14*(3), 235–250.

Talukder, M., Rahman, M., & Chowdhury, M. (2023). Challenges of AI adoption in hotel services. *Tourism Management Perspectives, 45*, 101–118.

Tornatzky, L., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington Books.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Wang, Y., Li, H., & Xu, X. (2021). AI adoption and cybersecurity practices in hospitality. *International Journal of Hospitality Management, 95*, 102–114.