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Factors Influencing Artificial Intelligence Implementation Among Customer Agents in Airline Call Centres

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Abstract: Airlines' traditional call centres utilize a human workforce to manage customer interactions. Despite this, various challenges have been experienced, including prolonged waiting times and inconsistent service delivery. Although the integration of Artificial Intelligence (AI)-driven chatbots offers a potential solution to these challenges through their automated nature, it also comes with a new set of complex issues that surround workforce efficiency, information security, and service efficacy. Although sufficient literature is available concerning the perceptions of AI systems regarding their utilization and usability, a research gap exists in AI and airlines**.** To address these gaps, a study applied a quantitative method using convenience sampling, targeting 103 call centre employees of Malaysian-based airlines. This research adopted the Technology Acceptance Model (TAM) via factor, reliability, correlation, and regression analysis, as the implications of this study were portrayed towards a digitalized format. The analysis illustrated that the human workforce influenced the AI Implementation, while perceived ease of use showed no significant effect. The study is limited by its small sample size, convenience sampling method, and focus on Malaysian-based airlines, which may reduce the generalizability of the findings. Additionally, the cross-sectional design and limited TAM variables may not fully capture the factors influencing AI implementation. This study addresses a research gap by examining AI chatbot implementation in airline call centers from employees' perspectives. It extends TAM in the airline context and highlights the significant influence of the human workforce on AI implementation, providing practical insights for digital transformation initiatives.

Keywords: *Airline call centres, artificial intelligence, human workforce, perceived ease of use*

1. Introduction

Artificial Intelligence (AI) integration has completely changed the customer service perspective for airlines, essentially forcing a move from the traditional call centre model to a human-AI hybrid collaboration. Airlines increasingly rely on AI-powered technologies such as chatbots, virtual assistants, and automated customer support platforms to improve service efficiency, reduce operational costs, and enhance customer satisfaction through personalized and real-time interactions. Industry evidence suggests that AI chatbots can handle up to 70% of customer inquiries in real time, allowing airlines to provide continuous 24/7 support while reducing the workload of frontline employees and improving service responsiveness. As indicated by Trawnih et al. (2022), this paper uses the Technology Acceptance Model to understand how perceived ease of use and the human workforce play their role in the successful integration of AI. While there is no doubt about the potential behind AI, which diminishes waiting times by up to 80% (Sai & Karnam, 2025), along with huge cost savings, the challenges relating to job losses (Mazingue, 2023), data security, and emotionless algorithms operating on high-stakes customer complaints are issues that remain at stake. The research therefore surveys responses from airline managerial and executive employees in call centres on how organizations can balance automated efficiencies with much-needed human empathy to create a more customer-focused service quality and leverage their competitive advantage in the digital-first marketplace.

This study contributes to the growing body of knowledge on AI adoption in Malaysia's aviation industry, an area that remains relatively underexplored from an employee perspective. As Malaysian airlines accelerate digitalization efforts to meet rising customer expectations for faster and more personalized services, the findings can assist policymakers, airline operators, and human resource managers in developing effective AI

implementation strategies. The study also provides practical recommendations for workforce training, change management, and customer service enhancement, ensuring that AI technologies complement rather than replace human capabilities. Ultimately, the research supports Malaysia's broader digital transformation agenda by promoting responsible and effective AI integration within the aviation sector.

2. Literature Review

This study focuses on two factors influencing AI implementation, as the Technology Acceptance Model (TAM) theory has been adapted to determine the perceived ease of use and usefulness towards AI technology intention utilization (O'dea et al., 2025). AI implementation is the automation derived from the human workforce (Morandini et al., 2023) and the perceived ease of use of technology (Lee et al., 2018).

Human workforce is defined as a group of human beings engaged in work, especially in companies or industries. Categories of workforce determine by the ability and individual by the organizations (Hameed & Waheed, 2011). Human workforce remains relevant in this global economy even though increasingly usage of automation machine or AI. Meanwhile, perceived ease of use refers to the technology implemented in customer service influencing the attitude to perceived (Payne & O'Brien, 2024). Technology is a process where implementation of basic knowledge to transform into a development using tools, systems and machines to improve human efficiency. It has been referred to as not naturally occurring, as it is based on human-made systems (Carroll, 2017).

Human Workforce towards AI Implementation in Airlines Call Centres

While there have been several claims that AI can revolutionize the handling of repetitive tasks through improved efficiencies in operations (Barmer et al., 2021), human input is still crucial in complex situations that require the adoption of emotional intelligence, ethical reasoning, and high brainpower activities. Nevertheless, several complaints have emerged over the years about human reliability in the management of AI technology, hence the need for workforce preparedness for AI systems (Nurlia et al., 2023). In this context, the organization becomes very instrumental in ensuring that the workers are well-trained in AI technology readiness to improve productivity. Quite unquestionably, human success rests in an empowered workforce that can thrive along with AI systems and thereby yield superior opportunities in a digital world.

H1: There is a significant relationship between human workforce and AI implementation in airlines call centres.

Perceived Ease of Use towards AI Implementation in Airlines Call Centres

Technology Acceptance Model component referred to as perceived ease of use is an essential factor as identified by Vebrianti et al. (2025). This has significant implications for the success of implementing AI in call centres which easy usage interface, not only reduces the workload on the employees, but customers too will be able to use the services independently. This has already been seen in industries such as airlines and hospitality, where AI has the potential to greatly enhance efficiency and cut down on work-related expenses (Li et al., 2021; Gürsoy et al, 2019). The initiative contributes importantly to airline operations, as AI will be able to handle repetitive operations such as flight details confirmation and booking-related tasks.

H2: There is no significant relationship between perceived ease of use towards AI implementation in airlines call centres.

3. Methodology

Research Design

A quantitative method was adopted to determine the factors influencing AI Implementation in airline call centres towards the human workforce and perceived ease of use, with data analysis carried out through SPSS software version 30.0. A structured sequence of analysis used, including descriptive analysis and factor analysis, as the analysis carried out to ascertain that factors were statistically well-defined. To ensure integrity, reliability analysis, as well as correlations with multiple regression analysis, was examined to validate the hypotheses and indicated the best factor predicting AI Implementation, with findings reported and discussed further in Results and Discussions.

Data Collection Procedures
The data were collected via Google Forms as a medium to deliver a structured questionnaire, and a total of 103 responses were received and kept for analysis. The survey collected information on respondents' demographic profiles and the factors contributing to comprehensive AI Implementation. The data obtained were supported by academic journals providing theoretical evidence to strengthen the findings.

Sampling Method
The population of this study comprised of both managerial and call centre agents from Malaysian-based airlines, focusing on customer service frontliners aged 20 to above 40 years old who are familiar with the digitalization of AI usage throughout CRM platforms. A non-probability (convenience sampling) method was implemented due to time and resource constraints (Vasileiou, 2018) as the questionnaire was distributed to the Malaysian-based airlines' call centres and customer service personnel. The total of 103 valid responses collected exceeded the minimum sample size of 85, with a statistical power of 0.80 by Bujang et al. (2024), for an 80% chance of statistical significance.

Research Framework
The conceptual framework demonstrates how independent variables relate to the dependent variable, which is AI Implementation in airlines' call centres. It was constructed based on the Technology Acceptance Model (TAM), which highlights the tech-savvy acceptance of perceived ease of use (O'dea et al., 2025) that influences AI Implementation. Furthermore, the insights on the factors of AI Implementation towards the human workforce are embedded in this framework to further investigate their relationship and contribution to AI Implementation.

Research Instruments
The study was executed through a structured survey as a data collection tool. The questionnaire was comprised of two main parts: the first part on respondents' demographic profile, such as age, gender, work experience, and CRM tools integrated with AI usage. The second part covered on independent and dependent variables which it has been evaluated using the seven-point Likert scale ranging from 1 to 7 which represents "strongly disagree" to "strongly agree" respectively (Ameen et al., 2021), adapted from the call centre survey on service quality performance as to apply AI in their daily scope. The independent variables contained 4 items each, while the dependent variable had 6 items.

Data Processing and Analysis
The data collected were processed and analyzed using SPSS version 30.0. Descriptive analysis summarized the demographic profile, such as age, gender, working experience, and the AI usage integrated into CRM tools, which were presented using tables. Further analysis on the variables was performed using factor analysis to indicate the sampling adequacy of the study, then reliability analysis of Cronbach's alpha for data accuracy. Finally, on the correlation analysis on indicating its linear relationship based on the correlation coefficients as well as regression on testing the hypothesis validity.

4. Findings and Results

Demographic profile of the respondents was summarized in general were aged 20 to above 40 years old, number of 43 was the highest within the range age 31-35 years old. In total of 103 respondents, categorized into 58.3% female and 41.7% male respectively, which all have the experience on using the AI integrated CRM tools.

Factor Analysis
Factor analysis has been conducted on identifying the sampling adequacy using the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity which the coefficient value must be exceeding to 0.50 significantly (Ahmed & Maruod, 2025). KMO for this study indicated 0.91, as this fulfilled the requirement of an adequate sampling frame, whereby Bartlett's Test of Sphericity was significant ($p<0.05$), proving that the relationship between variables was possible and interconnected.

Reliability Analysis

Reliability was measured by the consistency of the elements measured via Cronbach's alpha, exceeding 0.7 (Tavakol & Dennick, 2011) to accept its validity. It showed that the coefficient obtained was more than 0.7, as the items in this study were suitable for use.

Table 1: Summary of reliability analysis

Variables (Items)	Total Items	Cronbach's Alpha
Human Workforce	4	0.788
Perceived Ease of Use	4	0.874
AI Implementation	6	0.814

Correlation Analysis

The correlation analysis highlighted that coefficients constructed between 0.4 and 0.5 were moderate correlations, 0.5 to 0.7 were high correlations and above 0.7 were very strong correlations (Senthilnathan, 2019). All components were acceptable, with the strongest recorded values of 0.723 and 0.694 respectively, for human workforce and perceived ease of use towards AI Implementation in airline call centres.

Table 2: Summary of correlation analysis

	Artificial Intelligence Implementation	Human Workforce	Perceived Ease of Use
Artificial Intelligence Implementation			
Human Workforce	.723**		
Perceived Ease of Use	.694**	.725**	

** Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

The provided analysis utilized multiple regression to evaluate how various factors influence AI implementation within airline call centres, revealing that the model explains 67.6% of the variance ($R2 = 0.676$) and is statistically significant overall ($p < 0.05$). Among the variables tested, human workforce ($\beta = 0.28$) influenced the factors of AI Implementation; however, perceived ease of use was found to have no significant relationship with the adoption of AI in this specific context.

Table 3: Summary of regression analysis

Model	AI Implementation				
	Unstandardized Beta	Coefficients Std. Error	Standardized Beta Coefficient	t	Sig.
(Constant)	0.49	0.319		1.538	0.127
Human Workforce	0.245	0.082	0.28	3.009	0.003
Perceived Ease of Use	0.066	0.084	0.078	0.786	0.433

ANOVA, Significant value = <0.001

Discussion

The incorporation of AI technology in the call centre industry is a paradigm shift in the human workforce because it automates manual jobs and data input, which has been proven to increase first call resolution by up to 27% (Sahoo, 2025). Increased incorporation of digital technology in the workforce, which has been disrupted by the COVID-19 pandemic, has led to fears of replacement by technology, the environment is ripe for human-AI collaboration. This is because the human aspect is left to perform high-value jobs such as emotional intelligence, flexibility, and problem-solving. To stay relevant in the future, the human workforce is encouraged to explore other high-tech fields such as AI engineering and data analysis.

The introduction of AI systems in airline call centres may provide a strategic opportunity to increase

productivity by automating routine tasks and facilitating a smooth flow of information for routine inquiries, but it is also challenged by issues such as operational costs and "perceived ease of use." In this study, we predicted that the perceived ease of use would positively influence the AI Implementation among customer agents airlines call centres despite its convenience, however, insufficient training courses (Shamim et al., 2023) will contribute towards low confidence level and trust (Vuori & Burkhard, 2025) of AI usage in daily scopes. Although AI systems have moved from being static robots to highly personalized assistants that can perform multi-level tasks with minimal human intervention, they still fail to understand complex human behaviors and emotional intelligence, which often results in anxiety and trust problems for users. Moreover, AI systems are only as effective as the information they retrieve from their respective databases in real time and require robust systems to ensure that there is no disruption to their services (Selvanathan, 2025). Although AI systems have been successful in reducing customer handling times and clerical workload, there is still a challenge to achieve a perfect balance between robots and human touch for high-level customer satisfaction.

5. Conclusion and Recommendations

The implementation of Artificial Intelligence (AI) in airline call centres is a move towards a new hybrid model that changes from a technological support system to a workforce that is supplemented by AI. The success of this integration depends on two factors: human intelligence, which provides a level of empathy and complex problem-solving that AI cannot provide; perceived ease of use, which ensures the adoption of AI by ensuring that it is easy to use; perceived usefulness, which ensures that both the workforce and the consumer are aware of its value as a tool for increasing productivity and round-the-clock support. By upskilling the workforce, airlines can harness the power of AI while still being committed to the human aspect that is required for customer satisfaction.

Future Direction and Limitation

Future research should involve a larger and more diverse sample, including additional AI adoption factors beyond TAM, and adopt a longitudinal approach to provide a more comprehensive understanding of AI implementation in the airline industry, increase customer satisfaction, and improve operational cost-effectiveness.

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