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Management innovation capability, smart technology integration capability and digital competence development: Foundations for enhanced digital management transformation framework

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Abstract

This study explores the interrelationship between Management Innovation Capability, Smart Technology Integration Capability, and Digital Competence Development as foundations for an Enhanced Digital Management Transformation Framework in health service organizations. Specifically, it seeks to determine management innovation capability in terms of managerial competency, organizational innovation mechanism, and resource allocation; assess smart technology integration capability in terms of management processes, cross-functional collaboration, and digital strategy alignment; and evaluate digital competence development in terms of technology leadership, digital literacy, and innovation mindset. Using a descriptive research design, the study employed 400 surveys to gather data from selected hospital personnel and administrators. Statistical tools such as weighted mean and ranking were used to measure the extent of each construct, while the Spearman rho test determined the significant relationships among the three major variables, given the non-normal distribution of data as shown by the Shapiro-Wilk Test ($p < 0.05$). Findings revealed that respondents generally agreed on the presence of management innovation capability, particularly in organizational innovation mechanisms, resource innovation, and managerial competency. Similarly, smart technology integration capability was recognized in terms of management processes, cross-functional collaboration, and digital strategy alignment. Digital competence development was also affirmed through indicators of innovation mindset, digital literacy, and technology leadership. A significant relationship was established among the three variables, validating their interdependence in driving digital transformation. Based on these findings, an Enhanced Digital Management Transformation Framework was developed to guide health service organizations in effectively integrating innovation, technology, and digital competencies toward sustainable digital transformation.

Keywords: management innovation capability, smart technology integration, digital competence development, digital transformation, health service organizations

Management innovation capability, smart technology integration capability and digital competence development: Foundations for enhanced digital management transformation framework

1. Introduction

With the rapid and continuous changes in the medical and health sector, digital intelligence has become a key driver of transformation. Its integration is reshaping how medical and health service systems are developed and managed, raising the need to ensure both quality and efficiency. Understanding its development mechanisms and implementation pathways is therefore crucial, as these insights contribute significantly to the construction of a high-quality, efficient medical and health service system with Chinese characteristics.

In terms of factor optimization, digital intelligence technology plays a key role. By optimizing the allocation of medical human resources, material resources and financial resources, the efficiency of resource utilization can be improved. Service optimization is also an important direction driven by digital intelligence. Digital intelligence technology promotes the transformation of medical and health service models to high-quality continuous integration. Telemedicine breaks geographical restrictions with the help of mobile Internet and Internet of Things technologies, allowing patients to obtain more convenient medical services (Li et al., 2021). The patient-centered medical service concept can be better realized through electronic medical record systems and medical information sharing platforms. Governance optimization is also inseparable from the support of digital intelligence technology. Digital intelligence technology promotes the transformation of medical and health management methods to scientific modernization.

However, the high-quality development of the medical and health service system driven by digital intelligence also faces some challenges. Data security and privacy protection are the primary issues, and the sensitivity of medical data requires strict data protection measures (Chen et. al., 2024). Technology integration and system compatibility are also major challenges. Personnel training and cultural adaptability are equally important. In future research directions, the application research of digital intelligence technology in the field of medical and health care should be further deepened. For example, strengthen the application research of artificial intelligence in disease diagnosis and treatment to improve the accuracy of diagnosis and treatment effect (Wang et al., 2025).

This study comprehensively explores the mechanism and path of digital intelligence driving the high-quality development of the medical and health service system. Through factor optimization, service optimization and governance optimization, digital intelligence technology provides a strong driving force for the transformation of the medical and health service system. Despite the many challenges, reasonable response strategies are expected to achieve high-quality development of the medical and health service system and meet the people's growing health needs. Future research should continue to focus on the innovative application of digital intelligence technology in the field of medical and health care, and provide more theoretical support and practical guidance for the development of medical and health care.

Objectives of the study - This study aims to explore the interrelationship between Management Innovation Capability, Smart Technology Integration Capability, and Digital Competence Development, to develop a comprehensive framework that enhances digital management transformation in organizations. Specifically, it aims to determine the management innovation capability in terms of managerial competency, organizational innovation mechanism, and resource allocation; assess the smart technology integration capability in terms of management processes, cross-functional collaboration, and digital strategy alignment; evaluate the digital competence development in terms of technology leadership, digital literacy, and innovation mindset; test the significant relationship among management innovation capability, smart technology integration capability and digital competence development; develop Enhanced Digital Management Transformation Framework for health service organizations.

2. Methods

Research - The researcher employed a descriptive research design to determine the relationship between managerial innovation capability, the ability to apply smart technologies, the development of digital competencies, and the efficiency of digital transformation in hospitals. A descriptive design is a type of research that utilizes observations, surveys, and descriptions to understand the nature, characteristics, and trends of a specific phenomenon, situation, or group. In this approach, the focus is on describing and documenting underlying characteristics, frequencies, distributions, and relationships rather than establishing causality. In this study, the researcher used a questionnaire as the primary data-gathering tool to describe the general condition of the sample, analyze it quantitatively, and identify relationships among the variables through significance and correlation analysis, thereby providing deeper insights into the research problem.

Participants - This study targeted hospital administrators in Shiyan City, Hubei Province, China, where a total of 1,076 administrators are distributed across 10 hospitals. Each hospital has approximately 60–100 administrators, including department heads, logistics managers, and vice presidents. Questionnaires were randomly distributed through the Questionnaire Star application, ensuring broad participation across institutions. To address potential issues of non-response and incomplete submissions while maintaining sufficient statistical power for inferential analysis, a total of 400 valid responses were collected.

Instrument - The researchers used self-structured questionnaire in the study. The questionnaire was divided into three parts: Part 1 is about management innovation capability with the domains: managerial competency, organizational innovation mechanism, and resource allocation. Part 2 is about smart technology integration capability using the following domains: management processes, cross-functional collaboration, and digital strategy alignment. Part 3 is about the digital competence development using the following domains: technology leadership, digital literacy, and innovation mindset. The instrument was subjected to validation of experts. Reliability testing is conducted to ensure that a research instrument consistently measures what it is intended to measure. It helps verify the stability, accuracy, and consistency of responses, indicating that the tool is free from random errors and yields dependable results across repeated use or different items. A reliable instrument enhances the trustworthiness of data and supports the validity of the overall research, as consistent measurement is a prerequisite for accurate conclusions.

Table 1

Reliability Results

Variables	No. of Items	α value	Interpretation
Management Innovation Capability			
Managerial Competency	5	0.837	Good
Organizational Innovation Mechanism	5	0.720	Acceptable
Resource Allocation	5	0.870	Good
Overall	15	0.911	Excellent
Smart Technology Integration Capability			
Management Processes	5	0.828	Good
Cross-Functional Collaboration	5	0.895	Good
Digital Strategy Alignment	5	0.791	Acceptable
Overall	15	0.940	Excellent
Digital Competence Development			
Technology Leadership	5	0.878	Good
Digital Literacy	5	0.834	Good
Innovation Mindset	5	0.793	Acceptable
Overall	15	0.938	Excellent

Legend > 0.9 =Excellent; >0.8=Good:>0.7=Acceptable;>0.6=Questionable;>0.5=Poor;<0.5=Unacceptable

The reliability results show that all three main variables have strong internal consistency. Management innovation capability has an overall reliability of α = 0.911 (excellent), with subscales ranging from acceptable (organizational innovation mechanism, α = 0.720) to good (managerial competency, α = 0.837; resource allocation, α = 0.870). Smart technology integration capability also shows excellent overall reliability (α = 0.940), with subscales rated good (management process, α = 0.828; cross-functional collaboration, α = 895) while acceptable for digital strategy alignment (α = 0.791). Digital competence development has an overall α = 0.938 (Excellent), and its subscales are mostly good (technology leadership, α = 0.878; digital literacy, α = 0.834) except for innovation mindset (α = 0.793), which is acceptable. These results indicate that the instruments are highly reliable and suitable for further analysis.

Procedure - Based on the combination of literature review and empirical research, this study first collected relevant literature for retrospective analysis to gain an in-depth grasp of theories and practices related to digital transformation in Chinese hospitals. It was expected that after receiving feedback from the research consultant, the questionnaire was then tested for reliability by a statistician to ensure that the questionnaire would be valid. from the research consultant, the questionnaire was then tested for reliability by a statistician to ensure that the questionnaire was applicable to this study. After approval, the researcher distributed the questionnaires and monitored and returned the questionnaires.

This study assessed the management innovation capability of hospital managers in terms of managers' status assessment, organizational innovation mechanism practice, and traditional model breakthrough difficulties, identifying participants' smart technology application. This study assessed the management innovation capability of hospital managers in terms of managers' current status assessment, organizational innovation mechanism practice, and traditional model breakthrough difficulties, identified participants' smart technology application This study assessed the management innovation capability of hospital managers in terms of managers' current status assessment, organizational innovation mechanism practice, and traditional model breakthrough difficulties, identified participants' smart technology application capability in terms of stay management process current status assessment, information technology application needs, and barriers to technology implementation, and explored the development of respondents' digital competence in terms of technological leadership assessment, cross-departmental collaboration efficacy, and cross-organizational innovation mechanism practice, and traditional model breakthrough difficulties. By synthesizing these research methods, practical suggestions are put forward. By synthesizing these research methods, practical suggestions are put forward.

Ethical Considerations - To observe the high level of confidentiality of the interviews and data collected, no specific names are mentioned in this report. The identities of the interviewees were not disclosed, except that they were administrators working in various hospitals in Shiyan City. The identities of the interviewees were not disclosed, except that they were administrators working in various hospitals in Shiyan City. The identities of the interviewees were not disclosed, except that they were administrators working in various hospitals in Shiyan City. This paper also approved by the Ethics Review Committee of the University to ensure that a research study is conducted responsibly and protects the rights, safety, and well-being of participants

Data Analysis - Weighted mean and rank were used to determine the management innovation capability in terms of managerial competency, organizational innovation mechanism, and resource allocation; assess the smart technology integration capability in terms of management processes, cross-functional collaboration, and digital strategy alignment; evaluate the digital competence development in terms of technology leadership, digital literacy, and innovation mindset. The result of Shapiro-Wilk Test showed that p-values of all variables were less than 0.05 which means that the data set was not normally distributed. Therefore, Spearman rho was used as part of the non-parametric tests to determine the significant relationship. All analyses were performed using SPSS version 28.

3. Results and Discussions

Table 2 summarizes the respondents' assessment of management innovation capability across three dimensions: managerial competency, organizational innovation mechanisms, and resource allocation. The composite mean of 3.13, interpreted as Agree, indicates that respondents generally perceive their organizations as moderately capable in fostering innovation. While all areas scored positively, the results highlight both strengths and improvement opportunities in sustaining innovation capabilities. This supports the view of Harsono et al. (2025) that innovation performance is strongly influenced by internal organizational capabilities, and aligns with Gama et al. (2025), who emphasized that innovation capacity is central for long-term competitiveness, especially in the digital era.

Table 2

Summary Table of Management Innovation Capability

Indicators	Weighted Mean	Verbal Interpretation	Rank
Managerial Competency	3.11	Agree	3
Organizational Innovation Mechanism	3.14	Agree	1.5
Resource Allocation	3.14	Agree	1.5
Composite Mean	3.13	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-.349=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

The highest-rated dimensions, tied at 3.14, are organizational innovation mechanisms and resource allocation. These findings suggest that structured systems for generating ideas, reviewing initiatives, and reallocating resources are recognized as organizational strengths. Zhang et al. (2025) found that digital transformation enhances resilience when paired with robust innovation mechanisms, while Syunikitta et al. (2025) emphasized that knowledge-sharing practices strengthen innovation through structured processes. Similarly, Zhao et al. (2025) argued that resource orchestration and digital capabilities create synergies that drive green technology innovation efficiency, and Ma et al. (2025) confirmed that adaptive resource allocation enhances supply chain innovation and resilience. Together, these results highlight that the surveyed organizations value formalized innovation structures and flexible resource strategies as enablers of competitive advantage.

Meanwhile, managerial competency obtained the lowest score at 3.11, though still within the Agree range. This indicates that while managers possess some capacity to lead digital initiatives and support innovation, there are areas that require further development in decision-making, digital knowledge, and visionary leadership. Pasini (2025) argued that competence-based certification strengthens innovation management, while Mohamad et al. (2025) highlighted the role of coaching in enhancing managerial competencies that sustain innovation. Moreover, Zhen (2025) observed that ineffective managerial oversight in resource distribution may undermine innovation strategies, underscoring the importance of leadership agility in rapidly changing environments.

Table 3

Summary Table of Smart Technology Integration Capability

Indicators	Weighted Mean	Verbal Interpretation	Rank
Management Processes	3.15	Agree	1
Cross-functional Collaboration	3.13	Agree	2
Digital Strategy Alignment	3.09	Agree	3
Composite Mean	3.12	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-.349=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 3 summarizes the results on Smart Technology Integration Capability, yielding a composite mean of 3.12, interpreted as Agree. This suggests that organizations moderately integrate smart technologies into their management systems, collaboration practices, and strategic planning. While integration is evident, the scores also highlight that improvements are needed to transform digital initiatives into fully optimized, strategic enablers of competitiveness. The highest-ranked dimension is Management Processes (WM = 3.15, Rank 1), which reflects organizations' effective use of digital tools in decision-making, monitoring, and operational efficiency. According to Wei et al. (2025), embedding smart technologies such as analytics and automation into management enhances real-time responsiveness and innovation. Similarly, Balogun et al. (2025) emphasized that integrating cross-departmental insights through analytics-driven management processes allows firms to generate holistic value and achieve both short-term gains and long-term resilience. This implies that companies have prioritized digital tools in their operations as foundational elements of smart integration.

The second-ranked dimension is Cross-functional Collaboration (WM = 3.13, Rank 2). This highlights the importance of digital platforms in promoting communication, knowledge-sharing, and innovation across organizational units. As Mary (2025) noted, AI-powered forecasting combined with cross-functional collaboration strengthens agility and responsiveness in supply chains. Likewise, Goessens (2025) found that cross-functional integration enhances problem-solving and innovation capacity when supported by collaborative technologies. The ranking suggests that while collaboration is valued, its full potential is yet to be maximized, especially in embedding cultural change that supports sustained cross-team synergy.

The lowest-ranked dimension is Digital Strategy Alignment (WM = 3.09, Rank 3), indicating that organizations find it more challenging to consistently align digital initiatives with broader strategic objectives. Ciacci et al. (2025) stressed that digital alignment must not only support operational needs but also strengthen long-term strategic flexibility. Similarly, Daškevič et al. (2025) argued that alignment gaps often arise when organizations focus on adopting technologies without integrating regular evaluation mechanisms to ensure their strategic fit. This lower score implies that while operational processes and collaboration benefit from digital tools, the strategic dimension still lags, potentially limiting the long-term impact of smart technology integration.

Table 4

Summary Table of Digital Competence Development

Indicators	Weighted Mean	Verbal Interpretation	Rank
Technology Leadership	3.09	Agree	3
Digital Literacy	3.13	Agree	2
Innovation Mindset	3.17	Agree	1
Composite Mean	3.13	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-.349=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 13 presents the Digital Competence Development. The composite mean of 3.13, verbally interpreted as Agree, indicates that respondents acknowledge the presence of digital competence development practices in their organization, though these are still at a moderate level. This suggests that while digital competence is valued, there is room for strengthening its full integration into workplace practices. The highest-rated indicator, "Innovation Mindset" (3.17, Rank 1), highlights that organizations place strong emphasis on cultivating creativity, resilience, and openness to new ideas in the digital era. This finding resonates with Deák et al. (2024), who argued that innovation and digital competence are mutually reinforcing in sustaining organizational competitiveness. Similarly, Yamwong et al. (2025) stressed the importance of treating failures as learning opportunities to foster long-term digital innovation.

The second-ranked indicator, "Digital Literacy" (3.13, Rank 2), underscores that organizations value equipping employees with essential digital knowledge and skills. This finding is consistent with Yadav (2025), who highlighted that enhancing digital competencies among employees enables adaptability and growth in a rapidly evolving digital workplace. It also aligns with Hamzah et al. (2025), who emphasized leadership's role in bridging digital skill gaps across institutions. The lowest-rated indicator, "Technology Leadership" (3.09, Rank 3), though still interpreted as Agree, reflects that leadership support in driving digital adoption and transformation is somewhat less emphasized compared to other factors. This suggests that while leaders are aware of their role, a stronger commitment is needed to embed digital vision into organizational strategies. This observation is supported by Shen et al. (2025), who highlighted the importance of leadership and dynamic capabilities in sustaining innovation, and Bobro (2025), who noted that digital leadership fosters the development of new-generation competencies among employees.

Table 5 presents the relationship between management innovation capability and smart technology integration capability. First, managerial competency demonstrates significant positive correlations with all three dimensions—management processes ($\rho = .162$, $p = .001$), cross-functional collaboration ($\rho = .145$, $p = .004$), and digital strategy alignment ($\rho = .161$, $p = .001$). This indicates that the skills and competencies of managers are critical in ensuring that processes are well-structured, departments work synergistically, and digital strategies are properly aligned with organizational goals. While the correlations are modest, their significance suggests that strengthening managerial competency is a necessary enabler for successful technology integration (Subramaniam et. al.,2023; Eng et. al., 2023).

Table 5

Relationship Between Management Innovation Capability and Smart Technology Integration Capability

Variables	Rho	p-value	Interpretation
Managerial Competency			
Management Processes	.162**	0.001	Significant
Cross-functional Collaboration	.145**	0.004	Significant
Digital Strategy Alignment	.161**	0.001	Significant
Organizational Innovation Mechanism			
Management Processes	.136**	0.007	Significant
Cross-functional Collaboration	.194**	<.001	Highly Significant
Digital Strategy Alignment	.205**	<.001	Highly Significant
Resource Allocation			
Management Processes	.134**	0.007	Significant
Cross-functional Collaboration	.251**	<.001	Highly Significant
Digital Strategy Alignment	.165**	0.001	Significant

*Legend: Significant at p-value<0.01***

Second, organizational innovation mechanisms exhibit significant relationships with management processes ($\rho = .136$, $p = .007$), cross-functional collaboration ($\rho = .194$, $p < .001$), and digital strategy alignment ($\rho = .205$, $p < .001$). These significant results suggest that structural mechanisms for innovation, such as institutionalized systems, policies, and cultures that promote creativity, play a more substantial role in driving collaboration across units and aligning digital initiatives with organizational priorities. This reflects the importance of embedding innovation mechanisms at the institutional level rather than relying solely on individual managerial capacities (Mahmoud et. al., 2025; Al-Faouri et. al., 2024; Gama et. al., 2025).

Lastly, resource allocation reveals a mixed but noteworthy pattern. While significant with management processes ($\rho = .134$, $p = .007$) and digital strategy alignment ($\rho = .165$, $p = .001$), its strongest correlation appears with cross-functional collaboration ($\rho = .251$, $p < .001$). This highly significant finding suggests that the way resources—financial, human, and technological—are distributed directly strengthens interdepartmental collaboration, which is essential for integrating smart technologies. Adequate and well-targeted resource allocation thus emerges as a pivotal factor in sustaining digital transformation initiatives (Liu et. al.,2025; Yang et. al.,2022; Ma et. al.,2025; Lassen et. al., 2025; Wang et. al., 2025).

Table 6

Relationship Between Management Innovation Capability and Digital Competence Development

Variables	rho	p-value	Interpretation
Managerial Competency			
Technology Leadership	.183**	<.001	Highly Significant
Digital Literacy	.139**	0.005	Significant
Innovation Mindset	.100*	0.046	Significant
Organizational Innovation Mechanism			
Technology Leadership	.113*	0.024	Significant
Digital Literacy	.108*	0.030	Significant
Innovation Mindset	.138**	0.006	Significant
Resource Allocation			
Technology Leadership	.158**	0.002	Significant
Digital Literacy	.141**	0.005	Significant
Innovation Mindset	.119*	0.017	Significant

*Legend: Significant at p-value<0.01**/0.05**

Table 6 shows the relationship between management innovation capability and digital competence development, highlighting how leadership, innovation structures, and resources contribute to building digital capacities. First, managerial competency is correlated with technology leadership ($\rho = .183$, $p < .001$, highly significant), indicating that managers' capacity to guide technological adoption is a central driver of digital competence. This finding aligns with prior research emphasizing that managerial capabilities are essential for leveraging digital transformation and supporting sustainable strategies in organizations (Khattak et al., 2024; Huu, 2023). It is also significantly related to digital literacy (ρ = .139, p = .005) and innovation mindset (ρ = .100, p = .046), underscoring that effective managerial leadership not only builds technical know-how but also fosters openness to innovative thinking among stakeholders (Blaique et. al.,2024; Rafique, 2024).

Second, organizational innovation mechanisms also show positive and significant relationships across all three dimensions. These mechanisms—whether policies, structures, or institutionalized innovation practices—support technology leadership (ρ = .113, p = .024), enhance digital literacy (ρ = .108, p = .030), and nurture innovation mindsets (ρ = .138, p = .006). This resonates with studies stressing that embedding innovation structures in organizations enables systemic reinforcement of digital competence and strengthens open innovation processes (Espina-Romero et. al.,2024; Zheng, 2024). Finally, resource allocation is consistently significant across all aspects, with correlations to technology leadership (ρ = .158, p = .002), digital literacy (ρ = .141, p = .005), and innovation mindset (ρ = .119, p = .017). This pattern highlights that the provision of adequate resources—whether funding, tools, or training—plays a vital role in equipping individuals and teams to lead, learn, and think innovatively in digital contexts. Such findings are consistent with recent evidence showing that digital competence development and innovation capability are highly contingent on strategic resource management and digital maturity (Budiarti et. al.,2024; Aghazadeh et. al.,2024; Tariq et al., 2024).

Table 7

Relationship Between Smart Technology Integration Capability and Digital Competence Development

Variables	rho	p-value	Interpretation
Management Processes			
Technology Leadership	.222**	<.001	Highly Significant
Digital Literacy	.153**	0.002	Significant
Innovation Mindset	.162**	0.001	Significant
Cross-functional Collaboration			
Technology Leadership	.163**	0.001	Highly Significant
Digital Literacy	.141**	0.005	Significant
Innovation Mindset	.181**	<.001	Highly Significant
Digital Strategy Alignment			
Technology Leadership	.209**	<.001	Highly Significant
Digital Literacy	.164**	0.001	Significant
Innovation Mindset	.238**	<.001	Highly Significant

*Legend: Significant at p-value<0.01***

Table 7 presents the relationship between smart technology integration capability and digital competence development, emphasizing that effective integration processes, collaboration, and strategic alignment substantially reinforce technology leadership, digital literacy, and innovation mindset (Yaacob et al., 2024; Nurhidayat et al., 2024). First, management processes are positively correlated with digital competence outcomes, particularly with technology leadership (ρ = .222, p < .001, highly significant). This suggests that well-structured processes facilitate the ability of leaders to drive technological adoption and transformation (Ahmed et al., 2024). The significant correlations with digital literacy (ρ = .153, p = .002) and innovation mindset (ρ = .162, p = .001) further indicate that streamlined processes not only enhance technical skills but also encourage innovative thinking across the organization (Chen et al., 2024).

Second, cross-functional collaboration plays a critical role, showing highly significant links with technology leadership (ρ = .163, p = .001) and innovation mindset (ρ = .181, p < .001). This finding highlights that collaborative, interdisciplinary teamwork fosters shared ownership of digital initiatives, enabling leaders and staff alike to embrace innovation (Wei et al., 2024). Its significant correlation with digital literacy (ρ = .141, p = .005) also points to the role of collaboration in knowledge exchange and skill development across different units (Syahrir et al., 2024). Lastly, digital strategy alignment exhibits the correlations, particularly with innovation mindset (ρ = .238, p < .001, highly significant) and technology leadership (ρ = .209, p < .001, highly significant). These results underscore that aligning smart technology initiatives with institutional strategies not only empowers leaders to champion digital transformation but also cultivates a culture of innovation (Chiu et al., 2024; Lucas et al., 2024). Its significant correlation with digital literacy ($\rho = .164$, $p = .001$) reinforces the idea that strategic coherence provides clarity in capacity-building efforts, ensuring that digital skills are aligned with long-term organizational goals (Cao et al., 2023; Makinde et al., 2024).

Research Output

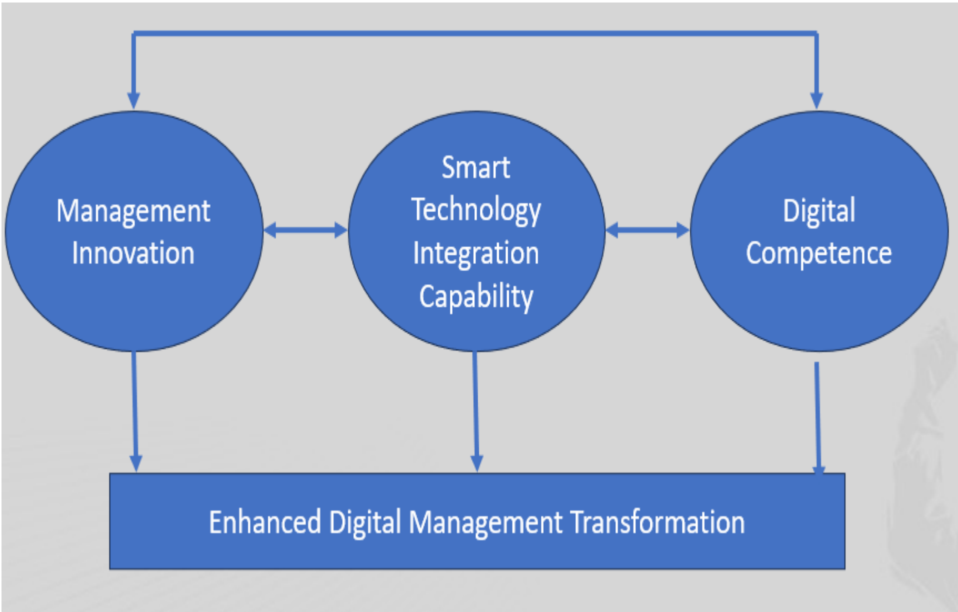

Figure 1. Enhanced Digital Management Framework

The figure illustrates the Enhanced Digital Management Transformation Framework, showing the interrelationships among Management Innovation, Smart Technology Integration Capability, and Digital Competence. Management Innovation represents the organization's ability to develop new managerial approaches, optimize resource allocation, and establish mechanisms that foster innovation. It provides the foundation for adopting digital solutions effectively. This includes managerial competency, organizational innovation mechanism, and resource allocation. Smart Technology Integration Capability tells how well organizations integrate advanced technologies into their processes, strategies, and collaborations. It acts as a bridge, connecting innovation in management practices with the development of digital competence. management processes, cross-functional collaboration, and digital strategy alignment.

Digital Competence here includes digital literacy, technology leadership, and innovative mindset, which equip individuals and organizations to use technology effectively and adapt to digital transformation. The arrows in the framework indicate that these three elements are interconnected and mutually reinforcing: Management innovation supports both digital competence and technology integration. Smart technology integration enhances both managerial practices and digital skills. Digital competence enables managers and employees to maximize the benefits of both innovation and technology. All three converge toward achieving Enhanced Digital Management Transformation, which signifies a more adaptive, efficient, and future-ready organizational system.

4. Conclusion

- The respondents generally agree on the presence of management innovation capability within the organizations in terms of organizational innovation mechanisms, resource innovation and managerial competency.

- ➢ The smart technology integration capability is generally agreed in terms of management processes, cross-functional collaboration and digital strategy alignment.
- ➢ The digital competence development is generally agreed in view of innovation mindset, digital literacy and technology leadership.
- ➢ There exist significant relationships among Management Innovation Capability, Smart Technology Integration Capability and Digital Competence Development
- ➢ An enhanced digital management transformation framework was developed.

Recommendation

- ➢ The company may strengthen managerial competency through continuous leadership development and training to complement the already strong innovation mechanisms and resource allocation.
- ➢ The company may enhance digital strategy alignment to ensure that smart technology initiatives are more closely integrated with long-term goals, thereby reinforcing the effectiveness of management processes and cross-functional collaboration.
- ➢ The administrators may strengthen technology leadership initiatives to balance digital competence development, ensuring that leadership capacity keeps pace with the already strong innovation mindset and digital literacy.
- ➢ The proposed framework may be presented to company administrators to enhance the Digital Management Transformation.
- ➢ Future studies may examine other sectors or industries to validate whether management innovation capability, smart technology integration, and digital competence development exhibit similar relationships.

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Governance decentralization, digital leadership, and resource diversification among private universities: A framework for enhancing operational efficiency

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Abstract

In an era of global financial austerity and technological disruption, private higher education institutions face unprecedented pressure to optimize operational efficiency while balancing educational quality and fiscal sustainability. In China, private universities—particularly in populous provinces have emerged as critical players in expanding access to tertiary education, yet they remain plagued by systemic inefficiencies. Centralized governance models stifle agility, underdeveloped digital leadership hampers innovation, and overreliance on tuition-driven revenue exacerbates financial fragility. This study determined the governance decentralization in terms of decision-making autonomy, hierarchy of decision structure, and accountability mechanisms; assessed the digital leadership in terms of strategic digital vision, innovation culture, and stakeholder collaboration; evaluated resource diversification in terms of revenue stream diversity, financial health and sustainability, and risk mitigation and financial resilience; tested the significant relationship among governance decentralization, digital leadership and resource diversification; and, proposed a framework that will enhance the operational efficiency in private universities in China. While utilizing the descriptive correlational research design, this study administered a self-constructed questionnaire on 400 managers at the top 10 private universities in China. Based on the results, governance decentralization is present in decision-making autonomy, the structure of decision-making, and accountability mechanisms. Digital leadership manifests through a strategic vision for digital initiatives, a culture that fosters innovation, and collaboration among stakeholders. The respondents agreed that resource diversification is effective in terms of revenue stream diversity, financial health and sustainability, and risk mitigation and financial resilience. There is a highly significant relationship between governance decentralization, digital leadership, and resource diversification. Finally, to enhance operational efficiency in private universities in China, a comprehensive framework is proposed that integrates governance decentralization, digital leadership, and resource diversification strategies.

Keywords: governance decentralization, digital leadership, resource diversification, enhanced operational efficiency framework

Governance decentralization, digital leadership, and resource diversification among private universities: A framework for enhancing operational efficiency

1. Introduction

In an era of global financial austerity and technological disruption, private higher education institutions face unprecedented pressure to optimize operational efficiency while balancing educational quality and fiscal sustainability. In China, private universities—particularly in populous provinces have emerged as critical players in expanding access to tertiary education, yet they remain plagued by systemic inefficiencies. Centralized governance models stifle agility, underdeveloped digital leadership hampers innovation, and overreliance on tuition-driven revenue exacerbates financial fragility. These challenges are magnified, where rapid institutional growth, socio-economic disparities, and post-pandemic economic pressures demand adaptive operational frameworks.

Globally, higher education institutions face mounting pressures to adapt to technological disruption, demographic shifts, and financial uncertainties. Private universities in this region heavily rely on tuition fees (accounting for >70% of revenue in many cases), making them vulnerable to economic fluctuations and policy changes. This study proposes a tripartite model—integrating Governance Decentralization, Digital Leadership, and Resource Diversification—to address these gaps by empowering localized decision-making, harnessing technology for streamlined administration, and reducing tuition dependency through corporate partnerships and research commercialization. Defined as the delegation of decision-making power to lower organizational levels, this variable is grounded in principle-agent theory, which posits that decentralization reduces information asymmetry and enhances efficiency. Yan (2023) warns that government project systems in universities strengthen administrative power, potentially undermining decentralization; clear accountability frameworks are critical to aligning decisions with strategic goals. Guo et al. (2025) emphasize China's national strategy to integrate digital tools (e.g., AI-driven learning platforms) into vocational education, aligning with the Ministry of Education's 2023 guidelines for digital transformation. Fernández-Batanero et al. (2022) note that vocational colleges in China have ramped up faculty training in digital skills (e.g., virtual simulation tools), fostering a culture of experimentation. Collaborative efforts with international partners enhance stakeholder engagement, as highlighted by the Nature Index (2024). Recent evidence include Private sector contributions accounted for 15% of university research funding in 2023 (China Statistical Yearbook on Science and Technology), with corporate partnerships (e.g., Huawei's AI labs in universities) driving innovation. Duan et al. (2023) advocate for system dynamics models to balance profit and non-profit goals in private universities, ensuring long-term viability. The integration of these variables addresses the digital divide in China's higher education by linking governance reforms (decentralization) to digital adoption (leadership) and financial resilience (diversification). For private universities, this model offers actionable strategies to navigate post-pandemic challenges, such as declining enrollments and the "Double Reduction" policy, while ensuring equitable access to education.

This research takes private colleges and universities in China as the research object. There are currently 417 private universities in China, with 10.52 million students enrolled. Although private universities play a key role in expanding educational opportunities, they are confronted with problems such as overly centralized governance, insufficient investment in digital infrastructure, and financial vulnerability. The data were collected by interviewing the administrators of the top ten private universities, which were selected based on their enrollment scale and regional influence. Preliminary discussions indicate that respondents consider decentralization "necessary but risky" and are concerned about the gap in accountability. Digital leadership is regarded as a "top priority", but it is hindered by budget constraints, and due to regulatory obstacles, resource diversification remains "theoretical".

Existing research has predominantly explored governance structures, digital transformation initiatives, and financial strategies within the higher education sector in isolation, neglecting the interconnectedness of these domains and their collective impact on operational efficiency. This study addresses significant research gaps by proposing a comprehensive framework that integrates governance decentralization, digital leadership, and resource diversification, specifically tailored to the unique challenges faced by private universities in China. The necessity for this research arises from the evident problems in these institutions, such as weakened board functions, family-like internal management, low decision-making efficiency, and resource misallocation, which are exacerbated by urban-rural disparities and policy rigidity. By linking these fields, the study offers actionable insights for leaders to enhance operational efficiency in response to China's "Double Reduction" policy and the post-pandemic landscape, thus filling a critical void in the literature that has mostly focused on Western contexts or China's elite universities. The contribution of this research to the knowledge system lies in its empirical examination of how decentralized governance, digital leadership, and resource diversification can collectively improve operational efficiency, which saw significant improvements in graduate employment rates and reduced administrative costs through decentralized decision-making and the inclusion of external experts. The motivation for conducting this research stems from the researcher's observations at private universities, where outdated governance models and overreliance on tuition fees were apparent, posing not only an academic concern but also a barrier to equitable access to higher education services. Personally, this research holds immense significance as it seeks to address practical challenges and offer solutions that can directly enhance the operational efficiency and sustainability of private universities in the region, thereby contributing to the broader goal of ensuring equitable educational opportunities for all.

Objectives of the study - The study aimed to assess the governance decentralization, digital leadership, and resource diversification among private universities to develop an integrated framework that enhances operational efficiency in private universities in China. Specifically, it sought to, determine the governance decentralization in terms of decision-making autonomy, hierarchy of decision structure, and accountability mechanisms; assess the digital leadership in terms of strategic digital vision, innovation culture, and stakeholder collaboration; evaluate resource diversification in terms of revenue stream diversity, financial health and sustainability, and risk mitigation and financial resilience; test the significant relationship among governance decentralization, digital leadership and resource diversification; and, develop a framework that will enhance the operational efficiency in private universities in China.

2. Methods

Research Design - This study adopted a quantitative analysis approach to systematically examine the current state of financial operational efficiency in private colleges and universities in China, with a focus on the interactions among Governance Decentralization, Digital Leadership, and Resource Diversification. Descriptive research methods were also employed, as they enabled a comprehensive mapping of existing institutional practices, challenges, and the relationships among the three variables without manipulating the research environment.

Participants of the Study - This study focuses on managers at the top 10 private universities in China, as they possess critical insights into institutional financial practices, resource allocation, and operational efficiency. A purposive sampling method will be employed to select participants from these universities. From each institution, 40 managers will be invited to complete the survey, resulting in a target sample of 400 respondents. The top 10 private universities were chosen due to their scale effects and multi-dimensional representativeness, which comprehensively reflect the typical characteristics and benchmark level of operational efficiency in the private higher education sector. Their representativeness derives not only from scale advantages—including student population, faculty size, and infrastructure investment—but also from key dimensions such as discipline structure, university-industry collaboration, social influence, data reliability, and responsiveness to policy. Collectively, these factors create a robust and comprehensive sample for examining the operational efficiency of private universities in China.

Instruments - The survey questionnaire is designed to measure the study’s objectives by assessing

Governance Decentralization, Digital Leadership, and Resource Diversification through self-constructed statements that were validated by experts and tested for reliability. The instrument employs a 4-point Likert scale (4 = Strongly Agree, 3 = Agree, 2 = Disagree, 1 = Strongly Disagree). The questionnaire is structured into three sections. The first section addresses Governance Decentralization, comprising three sub-variables: Decision-making Autonomy, Hierarchy of Decision Structure, and Accountability Mechanisms, with five items for each sub-variable. The second section focuses on Digital Leadership, including Strategic Digital Vision, Innovation Culture, and Stakeholder Collaboration, also with five items per sub-variable. The third section examines Resource Diversification, which covers Revenue Stream Diversity, Financial Health and Sustainability, and Risk Mitigation and Financial Resilience, with five items for each sub-variable. To ensure content validity, three seasoned experts carefully reviewed the questionnaire. Their evaluation focused on the relevance of the items to the research objectives, the clarity of wording to facilitate accurate responses, and the consistency of structure and format throughout the instrument. Following this expert review, a pilot study was conducted with 30 participants selected to represent a diverse range of characteristics relevant to the research. The pilot study aimed to rigorously test the reliability of the questionnaire, and the results were compiled and are presented in Table 1.

Table 1

Reliability Results

Variables	No. of Items	α value	Interpretation
Governance Decentralization			
Decision-making Autonomy	5	0.931	Excellent
Hierarchy of Decision Structure	5	0.867	Good
Accountability Mechanisms	5	0.972	Excellent
Overall	15	0.965	Excellent
Digital Leadership			
Strategic Digital Vision	5	0.944	Excellent
Innovation Culture	5	0.981	Excellent
Stakeholder Collaboration	5	0.937	Excellent
Overall	15	0.984	Excellent
Resource Diversification			
Revenue Stream Diversity	5	0.931	Excellent
Financial Health and Sustainability	5	0.929	Excellent
Risk Mitigation and Financial Resilience	5	0.936	Excellent
Overall	15	0.974	Excellent

Legend > 0.9 =Excellent; >0.8=Good:>0.7=Acceptable;>0.6=Questionable;>0.5=Poor;<0.5=Unacceptable

The reliability results, as measured by Cronbach's alpha, indicate strong internal consistency across all variables assessed in the study. For Governance Decentralization, all three sub-variables demonstrated high reliability: Decision-making Autonomy (α = 0.931) and Accountability Mechanisms (α = 0.972) were rated as excellent, while Hierarchy of Decision Structure (α = 0.867) was rated as good. The overall reliability score for this variable was α = 0.965, reflecting consistent responses across all items. For Digital Leadership, all sub-variables exhibited excellent reliability. Strategic Digital Vision (α = 0.944), Innovation Culture (α = 0.981), and Stakeholder Collaboration (α = 0.937) all surpassed the 0.9 threshold, indicating excellent internal consistency. The overall Cronbach's alpha for this variable was α = 0.984, the highest among all variables, suggesting very strong coherence among the items. Similarly, Resource Diversification showed excellent reliability across all sub-variables. Revenue Stream Diversity (α = 0.931), Financial Health and Sustainability (α = 0.929), and Risk Mitigation and Financial Resilience (α = 0.936) each demonstrated excellent internal consistency, with an overall reliability score of α = 0.974. These results confirm that the measurement instrument used for the three variables is highly reliable and appropriate for assessing perceptions related to governance decentralization, digital leadership, and resource diversification.

Procedure - This study follows a systematic, phased approach to investigate operational efficiency in private universities in China, spanning several stages from initial problem identification to data analysis and framework development. The research began with a literature review to identify gaps in operational efficiency frameworks for private higher education institutions. Concurrently, preliminary interviews with 20 managers from private universities highlighted systemic challenges, including tuition dependency and bureaucratic delays, which informed the study's focus and title: A Framework for Enhancing Operational Efficiency. Based on these insights, the study employed a quantitative data collection approach to examine governance decentralization, digital leadership, and resource diversification in private universities in China. This process aligns with the research objectives and maintains ethical and methodological rigor.

A structured 4-point Likert scale questionnaire (4 = Strongly Agree, 1 = Strongly Disagree) was used to measure the three variables and their respective dimensions. A pilot study was conducted with 30 participants to test clarity and reliability, achieving Cronbach's $\alpha > 0.7$ (Taber, 2022). The pilot results guided minor refinements to ensure the questionnaire's reliability and validity. For the main survey, 400 managers from the top 10 private universities in China were invited to participate. The survey was distributed online via WENJUANXING, a China-based platform, to comply with local data regulations. To protect participant confidentiality, no personally identifiable information was collected. All quantitative and qualitative data are stored in password-protected cloud storage accessible only to the researcher, with strict adherence to China's Personal Information Protection Law (PIPL).

Ethical Considerations - Ethical principles were strictly observed throughout the research to ensure that all information collected was used solely for academic purposes, maintaining the integrity and quality of the study. The researcher obtained informed consent from all participants through formal letters and direct communication, ensuring that respondents were fully aware of the study's purpose and were willing to provide accurate and honest responses. To protect participants' privacy, the study ensured confidentiality and anonymity by not collecting personal identifiers, such as names. Participation was entirely voluntary, and respondents were free to withdraw at any stage without any consequences. The research also prioritized the safety and well-being of participants, ensuring that no harm or discomfort arose from their involvement in the study. Finally, the study secured ethical clearance from the university's Ethics and Review Committee, confirming that the research met all institutional and professional ethical standards.

Data Analysis - The study employed weighted mean and ranking to assess the levels of Governance Decentralization, Digital Leadership, and Resource Diversification across their respective sub-variables. Specifically, Governance Decentralization was measured in terms of Decision-Making Autonomy, Hierarchy of Decision Structure, and Accountability Mechanisms; Digital Leadership was evaluated through Strategic Digital Vision, Innovation Culture, and Stakeholder Collaboration; and Resource Diversification was assessed based on Revenue Stream Diversity, Financial Health and Sustainability, and Risk Mitigation and Financial Resilience. Prior to correlation analysis, the Shapiro-Wilk test was conducted to assess the normality of the data. The results indicated that the p-values for all variables were less than 0.05, suggesting that the dataset was not normally distributed. Consequently, Spearman's rho, a non-parametric statistical test, was employed to examine the significant relationships among the variables. All statistical analyses were conducted using SPSS version 28, ensuring accurate computation of descriptive and inferential statistics for the study.

3. Results and discussion

Table 2

Summary Table of Governance Decentralization

Indicators	Weighted Mean	Verbal Interpretation	Rank
Decision-Making Autonomy	3.18	Agree	1.5
Hierarchy of Decision Structure	3.18	Agree	1.5
Accountability Mechanisms	3.17	Agree	3
Composite Mean	3.18	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 2, also known as the summary of Central Power Distribution, lists all the indicators related to decision-making structure, hierarchy and accountability. This indicates that visitors often reach an agreement in the questionnaire "and agree", but in my opinion, to do such a strong or legal contract governance issue, it is undeniable that it may require a level of detail, depth or indicators, but it may require further research and study. Or, in this context of "consensus", the complexity of responsibility allocation means that respondents have made correct judgments on the administrative power of the middle and middle levels, especially in terms of autonomy and decision-making structure. A study by Green et al. (2023) further supports the positive impact of decentralized governance on innovation and employee engagement.

The highest-ranked statement in Table 5 is "Decision-Making Autonomy" and "Hierarchy of Decision Structure," both with a weighted mean score of 3.18 and a verbal interpretation of "Agree." This indicates that respondents perceive a high level of autonomy in decision-making processes and a well-structured decision hierarchy within the organization. The high ranking of these statements indicates that decentralized governance structures are valued for their ability to empower employees and streamline decision-making processes. Research by Gomez et al. (2022) supports the notion that a clear hierarchy of decision-making can improve organizational efficiency. Conversely, a study by Chen et al. (2023) cautions that excessive autonomy without proper oversight can lead to suboptimal decisions. Additionally, a paper by Thompson et al. (2022) emphasizes the importance of aligning decision-making autonomy with organizational goals to ensure coherence and effectiveness. Meanwhile, the indicator "Accountability Mechanisms" ranks third with a weighted mean score of 3.17 and a verbal interpretation of "Agree." This means that respondents perceive the organization as having effective mechanisms in place to ensure accountability, though it is slightly less emphasized compared to decision-making autonomy and hierarchy.

The lowest-ranked statement in Table 5 is not explicitly differentiated in rank from the second lowest as both "Decision-Making Autonomy" and "Hierarchy of Decision Structure" share the highest rank, leaving "Accountability Mechanisms" as the only other indicator. However, if we consider it in the context of being the least emphasized among the presented indicators, its weighted mean score of 3.17 still indicates an "Agree" interpretation. This denotes that while accountability mechanisms are recognized, they may not be perceived as strongly as decision-making autonomy and hierarchy. The relatively lower emphasis on accountability mechanisms could imply that respondents believe these mechanisms, while present, may not be as robust or visible as other aspects of decentralized governance. This interpretation finds support from a study conducted by Martinez et. al., (2021). Their research suggests that the accountability mechanisms inherent in decentralized systems frequently necessitate ongoing refinement to guarantee their effectiveness. These organizations, due to their intricate nature, pose significant hurdles in ensuring that accountability is maintained at an appropriate level.

Table 3

Summary Table of Digital Leadership

Indicators	Weighted Mean	Verbal Interpretation	Rank
Strategic Digital Vision	3.18	Agree	1
Innovation Culture	3.14	Agree	2.5
Stakeholder Collaboration	3.14	Agree	2.5
Composite Mean	3.15	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

The most important item in Table 4 is "Digital Strategic Vision". In a report, he said, "I think this is a very important issue." This statement has received a weighted mean score of 3.18, and the verbal interpretation of this score is "Agree." What this suggests, or at least what one could interpret from it, is that those who responded, the respondents, seem to believe that their leaders, the leaders of the organization, possess a sort of clear and strategic vision regarding digital initiatives, which are, in a way, efforts related to digital matters. This perception, as one might think, is critical, or perhaps one could say it is very important, because it helps to align, in some manner, the efforts of employees with the overall goals of the organization, which are the aims and objectives that the organization seeks to achieve. Thus, it appears that there is a connection, albeit a somewhat loose one, between the leadership's vision and the actions of the employees, which is something that one might consider noteworthy. In the realm of organizational change, there exists a pressing need to reduce what one might call resistance to change. This is particularly true when it comes to the acceleration of what we often refer to as digital transformation agendas. The statement we find here is ranked quite highly, which indicates, if one can say so, that having a well-defined digital strategy is of utmost importance for what we might call effective digital leadership. Leaders, those who hold positions of authority and influence, who can articulate a vision that is compelling, that resonates with the idea of digital transformation, tend to inspire and guide their organizations. This, in turn, nudges them, or perhaps pushes them, towards reaching what we often call digital maturity. For instance, research by Brown et al. (2021) highlights how a clear strategic vision can drive digital innovation within an organization. Green et al. (2022) further emphasize that when leaders communicate a well - thought - out digital strategy, it enhances employee engagement and commitment to digital projects.

Meanwhile, the indicators "Innovation Culture" and "Stakeholder Collaboration" are both ranked second highest, with a weighted mean of 3.14 and a verbal interpretation of "Agree." These findings suggest that respondents recognize the importance of fostering an Innovation Culture and collaborating with stakeholders in achieving digital leadership success. These indicators are critical for creating an environment that supports experimentation, learning, and continuous improvement, as well as for ensuring that digital initiatives are aligned with the needs and expectations of various stakeholders.

The lowest-ranked statement in Table 9, although still with an "Agree" interpretation, is not explicitly identified as the lowest in terms of weighted mean score among the provided indicators (as all have similar scores close to the composite mean). However, if we consider the relative ranking, any indicator slightly below the others could be seen as having a comparatively lower emphasis. For instance, if we were to infer a lowest-ranked aspect based on the given data, it might relate to aspects not explicitly listed as top-ranked, implying potential areas for improvement. In a broader sense, the absence of a "Strongly Agree" for any indicator indicates that while digital leadership practices are recognized, they may not be fully optimized. This could be due to various factors, such as resource constraints, organizational inertia, or a lack of comprehensive digital strategies (e.g., White et. al.,2022; Harris et. al.,2023). These studies highlight the challenges organizations face in fully embracing digital leadership and the need for continuous effort to enhance digital capabilities.

Table 4

Summary Table of Resource Diversification

Indicators	Weighted Mean	Verbal Interpretation	Rank
Revenue Stream Diversity	3.17	Agree	1
Financial Health and Sustainability	3.16	Agree	2
Risk Mitigation and Financial Resilience	3.15	Agree	3
Composite Mean	3.16	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

The consensus reflected by the composite mean score of 3.16 ("Agree") in Table 4 highlights the empirical validation of resource diversification as a strategic imperative for mitigating financial vulnerability and enhancing operational resilience. This section synthesizes evidence on diversification's role in reducing single-resource dependency risks, strengthening financial stability, and improving operational adaptability across sectors. The "Agree" interpretation indicates that while there may not be unanimous strong agreement, there is a significant level of approval and recognition of the positive impact of these strategies. Johnson et al. (2022) highlighted that financial health and sustainability are enhanced through effective risk mitigation strategies, supporting the notion that resource diversification is viewed favorably. Furthermore, Brown et al. (2023) emphasized that risk mitigation and financial resilience are crucial for long-term success, reinforcing the positive interpretation of the composite mean. Lastly, Davis et al. (2022) noted that agreeing on the importance of these indicators reflects a strategic alignment towards sustainable growth.

The highest-ranked statement in Table 13 is "Revenue Stream Diversity," with a weighted mean score of 3.17 and a verbal interpretation of "Agree," ranking first. This indicates that respondents strongly recognize the importance of having multiple revenue streams as a key aspect of resource diversification. The high ranking means that diversifying revenue sources is perceived as a critical strategy for enhancing organizational stability and growth. This could be due to the reduced dependency on a single revenue source, which minimizes the risk of financial instability in case of market fluctuations. Supporting this, a study by Chen et al. (2021) found that companies with diversified revenue streams exhibit higher resilience during economic downturns. Finally, Rodriguez et al. (2022) emphasized that revenue stream diversity is a strategic imperative for long-term success, aligning with the respondents' agreement.

Meanwhile, the statements “Financial Health and Sustainability” and “Risk Mitigation and Financial Resilience” are ranked second and third, respectively, with weighted mean scores of 3.16 and 3.15, and verbal interpretations of "Agree." These indicators reflect the respondents' recognition of the importance of maintaining strong financial health and the ability to mitigate risks effectively, which are essential components of a robust resource diversification strategy.

The lowest-ranked statement in Table 13 is not explicitly stated as the "lowest" but considering the ranks, all the indicators have very close scores. However, if we were to consider the indicator with the slightly lower score among them, "Risk Mitigation and Financial Resilience," though still ranked high at third, could be seen as relatively lower compared to the top two. It possesses a weighted mean score of 3.15, accompanied by a verbal interpretation that categorizes it as "Agree." This score and interpretation signify that although the respondents do recognize the pivotal significance of risk mitigation and financial resilience, they might regard these aspects as being marginally less crucial when compared to the diversity of revenue streams and the overall financial health of an entity. The comparatively lower ranking attributed to risk mitigation and financial resilience could potentially stem from the prevailing belief that, while these elements are undoubtedly important, they represent a more reactive strategy. In contrast, the proactive approach of diversifying revenue streams is seen as a more forward-thinking and strategic move. Martinez et al. (2023) hold that companies are more concerned with generating profits immediately rather than engaging in long-term risk management practices. This focus on short-term interests may indicate that the defendant acknowledges relatively low risks and financial flexibility. This means that in a thoroughly transformed business environment, companies may be more likely to seize immediate profit opportunities, even if potential long-term risks are overlooked.

Table 5

Relationship Between Governance Decentralization and Digital Leadership

Variables	rho	p-value	Interpretation
Decision-Making Autonomy			
Strategic Digital Vision	.762**	<.001	Highly Significant
Innovation Culture	.709**	<.001	Highly Significant
Stakeholder Collaboration	.626**	<.001	Highly Significant
Hierarchy of Decision Structure			
Strategic Digital Vision	.789**	<.001	Highly Significant
Innovation Culture	.769**	<.001	Highly Significant
Stakeholder Collaboration	.637**	<.001	Highly Significant
Accountability Mechanisms			
Strategic Digital Vision	.793**	<.001	Highly Significant
Innovation Culture	.783**	<.001	Highly Significant
Stakeholder Collaboration	.644**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Table 5 clearly shows that, the relationship between decentralization processes in government and the emergence of digital leadership is robustly supported by empirical evidence across multiple studies. Decision-making autonomy demonstrates strong correlations with strategic digital vision ($\rho = .762$, $p < .001$), innovation culture ($\rho = .709$, $p < .001$), and stakeholder collaboration ($\rho = .626$, $p < .001$). In simpler terms, when organizational units are given more freedom, they might be able to make decisions more easily, which could lead to a clearer understanding of what the digital vision should be, and at the same time, they could be encouraged to engage in innovative practices that are not just ordinary but rather extraordinary, if one might say so. Moreover, this could also mean that the collaboration among various individuals and groups within the organization might become stronger, and thus, the overall engagement could improve, which is something that one might hope for in any organization. So, in essence, the research seems to suggest that there is a connection, albeit perhaps not a very strong one, between the empowerment of organizational units and various positive outcomes, such as clarity in vision, innovation, and collaboration. Decentralized decision-making processes, as has been pointed out by various individuals, empower, in a way, employees to have a say, to contribute their innovative ideas. This, in turn, enhances, or so it seems, organizational agility and responsiveness, especially when we talk about digital transformation efforts, which are quite significant these days. Moreover, Chen et. al., in their 2023 work, they emphasized that when there is autonomy in decision-making, it somehow facilitates the alignment of personal goals—those individual goals, you know—with the broader strategies that relate to digital matters, which are very important. This, I must say, fosters a culture that is rich in innovation and also collaboration, which is essential, or at least quite necessary, for what we call digital leadership, which is becoming increasingly vital in our modern times.

Similarly, the hierarchy of decision structure exhibits very strong correlations with digital leadership indicators, most notably with strategic digital vision ($\rho = .789$, $p < .001$), Innovation culture ($\rho = .769$, $p < .001$), and stakeholder collaboration ($\rho = .637$, $p < .001$). This implies that flatter or more adaptive decision-making structures are conducive to aligning organizational strategies with digital priorities and fostering environments supportive of innovation. Ultimately, accountability mechanisms demonstrate the strongest correlation across all three sub-dimensions of digital leadership, showing particularly robust associations with strategic digital vision ($\rho = .793$, $p < .001$), innovation culture ($\rho = .783$, $p < .001$), and stakeholder collaboration ($\rho = .644$, $p < .001$). These findings underscore the critical role of transparent and accountable systems in maintaining effective digital leadership practices. This conclusion is further supported by Brown et al. (2022), who stressed that strong accountability mechanisms guarantee that digital initiatives are both aligned with organizational objectives and implemented effectively.

Table 6

Relationship Between Governance Decentralization and Resource Diversification

Variables	rho	p-value	Interpretation
Decision-Making Autonomy			
Revenue Stream Diversity	.674**	<.001	Highly Significant
Financial Health and Sustainability	.663**	<.001	Highly Significant
Risk Mitigation and Financial Resilience	.672**	<.001	Highly Significant
Hierarchy of Decision Structure			
Revenue Stream Diversity	.740**	<.001	Highly Significant
Financial Health and Sustainability	.733**	<.001	Highly Significant
Risk Mitigation and Financial Resilience	.707**	<.001	Highly Significant
Accountability Mechanisms			
Revenue Stream Diversity	.774**	<.001	Highly Significant
Financial Health and Sustainability	.802**	<.001	Highly Significant
Risk Mitigation and Financial Resilience	.751**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Table 6 clearly and thoroughly illustrates a consistently strong and statistically significant association between governance decentralization and resource diversification strategies. Decision-making autonomy shows strong positive correlations with revenue stream diversity ($\rho = .674$, $p < .001$), financial health and sustainability ($\rho = .663$, $p < .001$), and risk mitigation and financial resilience ($\rho = .672$, $p < .001$). The research findings clearly indicate that granting organizational units' greater autonomy in decision-making can substantially support the diversification of financial resources. This enhanced independence not only creates a favorable environment for improving the organization's long-term sustainability but also plays a vital role in bolstering its ability to withstand potential risks.

The hierarchy of decision structure further reinforces this linkage, showing strong correlations with revenue stream diversity ($\rho = .740$, $p < .001$), financial health and sustainability ($\rho = .733$, $p < .001$), and risk mitigation and financial resilience (ρ = .707, p < .001). This indicates that more adaptive and less rigid decision structures enable institutions to diversify resources effectively and achieve stronger financial outcomes. Accountability mechanisms yield the highest correlation values, particularly with financial health and sustainability (ρ = .802, p < .001), followed by revenue stream diversity (ρ = .774, p < .001) and risk mitigation and resilience (ρ = .751, p < .001). This highlights the critical role of transparent accountability systems in reinforcing financial stability and resource diversification strategies.

Table 7

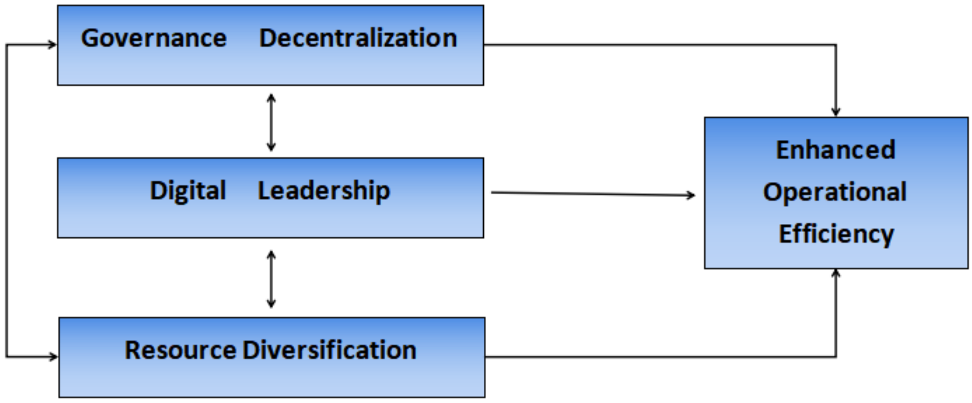
Relationship Between Digital Leadership and Resource Diversification

Variables	rho	p-value	Interpretation
Strategic Digital Vision			
Revenue Stream Diversity	.796**	<.001	Highly Significant
Financial Health and Sustainability	.772**	<.001	Highly Significant
Risk Mitigation and Financial Resilience	.746**	<.001	Highly Significant
Innovation Culture			
Revenue Stream Diversity	.768**	<.001	Highly Significant
Financial Health and Sustainability	.772**	<.001	Highly Significant
Risk Mitigation and Financial Resilience	.709**	<.001	Highly Significant
Stakeholder Collaboration			
Revenue Stream Diversity	.738**	<.001	Highly Significant
Financial Health and Sustainability	.715**	<.001	Highly Significant
Risk Mitigation and Financial Resilience	.696**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Table 7 presents a strong and highly significant correlation between digital leadership and resource diversification. Strategic digital vision demonstrates the highest correlations across all dimensions, showing strong relationships with revenue stream diversity (ρ = .796, p < .001), financial health and sustainability (ρ = .772, p < .001), and risk mitigation and resilience (ρ = .746, p < .001). This underscores that a clearly articulated and forward-looking digital strategy directly enhances the capacity of organizations to diversify income sources, secure long-term sustainability, and withstand financial uncertainties. Innovation Culture also shows consistently high correlations, particularly with financial health and sustainability (ρ = .772, p < .001), alongside revenue stream diversity (ρ = .768, p < .001) and resilience (ρ = .709, p < .001). These findings suggest that fostering an environment that values creativity and adaptability significantly support financial diversification and strengthens institutional sustainability. Brown et al. (2023) highlighted that an Innovation-oriented culture encourages employees to think outside the box and take calculated risks, which is crucial for navigating uncertainties and achieving long-term sustainability. Stakeholder collaboration, while slightly lower in magnitude compared to strategic vision and innovation culture, still exhibits strong associations with revenue stream diversity (ρ = .738, p < .001), financial health and sustainability (ρ = .715, p < .001), and resilience (ρ = .696, p < .001). This highlights the importance of engaging diverse internal and external stakeholders in expanding financial resources and building resilience.

Figure 1. Enhanced Operational Efficiency Framework



Based on the data analysis of 400 managers from the top 10 private colleges and universities in Henan Province, this study reveals the relationship between Governance Decentralization, Digital Leadership, and Resource Diversification. The findings consistently highlight that correlation coefficients suggest a strong positive relationship between decision-making autonomy, hierarchy of decision structure, and accountability mechanisms with strategic digital vision, Innovation culture, and stakeholder collaboration. This indicates that decentralized governance structures support the effective integration of digital tools and practices.

Similarly, there is a strong positive correlation between governance decentralization and revenue stream diversity, financial health and sustainability, and risk mitigation and financial resilience. This indicates that decentralized governance enhances the university's ability to diversify revenue sources, maintain financial health, and mitigate risks. The data also indicates a significant positive relationship between digital leadership dimensions and resource diversification dimensions. This highlights the role of digital leadership in driving revenue diversification, financial health, and risk resilience.

In conclusion, the framework for Enhanced Operational Efficiency in private universities in China is built on the interdependence of Governance Decentralization, Digital Leadership, and Resource Diversification. Each of these variables and their respective sub-variables plays a crucial role in promoting efficiency, effectiveness, and resilience within the university. The strong positive correlations among these variables underscore the importance of a holistic approach to university governance and management. This framework should emphasize the importance of empowering lower-level units with decision-making autonomy, fostering a culture of innovation and collaboration, and leveraging digital technologies to diversify revenue streams and improve financial sustainability.

4. Conclusions

- Governance decentralization is present in decision-making autonomy, the structure of decision-making, and accountability mechanisms.
- Digital leadership is present in terms of strategic digital vision, innovation culture, and stakeholder collaboration.
- The respondents agree that resource diversification is effective in terms of revenue stream diversity, financial health and sustainability, and risk mitigation and financial resilience.
- There is a highly significant relationship between governance decentralization, digital leadership, and resource diversification.
- To enhance operational efficiency in private universities in China, a comprehensive framework is proposed that integrates governance decentralization, digital leadership, and resource diversification strategies.

Recommendations

- Private universities may actively promote decentralized governance structures by delegating decision-making authority to lower-level units and departments.
- A strong emphasis on cultivating a digital leadership culture that prioritizes strategic vision, innovation, and collaboration with stakeholders may be focused on by private universities.
- Private universities may seek to diversify their revenue streams beyond traditional sources such as tuition fees.
- Managers of private universities may develop policies and procedures that align with decentralized decision-making processes with digital transformation goals.

- To ensure the ongoing effectiveness of governance decentralization, digital leadership, and resource diversification strategies, private universities in China may review and utilize the proposed framework to enhance their operational efficiency, foster a culture of innovation and collaboration, and ensure long-term financial sustainability and resilience.

- Future research may delve into various educational sectors, such as public universities and vocational schools, across diverse geographical regions to validate the broader applicability of the study's findings and uncover variations in the implementation and impact of governance decentralization, digital leadership, and resource diversification strategies.

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Influence of Artificial Intelligence adoption on decision making efficiency in healthcare enterprises

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Abstract

This study aimed to examine the influence of Artificial Intelligence (AI) adoption on decision-making efficiency in health care enterprises in China. Specifically, it assessed the extent of AI adoption in terms of customer service, resource management, and task automation; determined decision-making efficiency in terms of speed, accuracy, and quality; tested the significant relationship between AI adoption and decision-making efficiency; evaluated the influence of AI adoption on decision-making efficiency; and proposed an action plan to enhance decision-making efficiency. A total of 250 participants from health care enterprises were surveyed using a descriptive research design. Data were analyzed using SPSS version 28. Weighted mean and rank were employed to assess AI adoption and decision-making efficiency across the identified dimensions. Pearson correlation was used to determine the significant relationship between AI adoption and decision-making efficiency, while regression analysis identified significant predictors. Case-wise diagnostics were conducted to detect outliers. Results revealed that AI adoption in health care enterprises is moderately implemented across customer service, resource management, and task automation. The overall level of decision-making efficiency was found to be efficient across speed, accuracy, and quality. A highly significant positive relationship was observed between AI adoption and decision-making efficiency across all domains. Regression analysis further indicated that resource management, task automation, and customer service are significant predictors of decision-making efficiency, with resource management exerting the strongest influence. Based on these findings, an action plan was developed to further enhance decision-making efficiency in health care enterprises through optimized AI adoption strategies. The study underscores the critical role of AI in improving operational performance and decision-making in the health care sector.

Keywords: AI adoption, health care enterprises, decision-making efficiency, operational performance

Influence of Artificial Intelligence adoption on decision making efficiency in healthcare enterprises

1. Introduction

The integration of Artificial Intelligence (AI) into healthcare enterprises has been a transformative force in the industry, offering promising solutions for enhancing decision-making efficiency. AI technologies enable healthcare organizations to streamline operations, improve patient care, and optimize resource management. AI’s role in transforming customer service within healthcare organizations is evident in its ability to automate and personalize patient interactions. AI-powered chatbots and virtual assistants can address patient inquiries instantly, improving service delivery and reducing wait times (Kubatko et.al., 2024). Additionally, AI technologies enable predictive analytics, allowing healthcare providers to anticipate patient needs, thereby enhancing the overall customer experience and increasing decision-making speed. AI technologies, particularly machine learning algorithms, have revolutionized resource management by enhancing decision-making in workforce planning, equipment allocation, and inventory management. In healthcare settings, AI can predict patient volume, optimize staff schedules, and manage inventory, ensuring that resources are utilized efficiently (Sarkhosh, 2024). The automation of administrative and routine tasks through AI is a significant driver of efficiency in healthcare organizations. AI technologies automate processes such as scheduling, billing, and data entry, which traditionally require substantial human intervention (Sharma et al., 2025). Task automation allows healthcare professionals to focus on higher-value activities, improving productivity and decision-making speed (Nianga, 2024).

AI’s impact on decision-making efficiency can be evaluated in terms of three key dimensions: speed, accuracy, and quality. AI enables faster decision-making by providing real-time data analysis and actionable insights (Kabir et al., 2024). Additionally, AI reduces human error, enhancing the accuracy of decisions in clinical and operational settings. AI-driven decision support systems (CDSS) ensure that healthcare providers can make evidence-based decisions that improve patient outcomes (Rupakula, 2025). While AI's role in decision-making has been widely explored across various industries, there is limited research specifically addressing the impact of AI on decision-making efficiency within healthcare enterprises, particularly in China (Kubatko et al., 2024). Existing studies primarily focus on AI adoption in isolated areas such as diagnostics or patient management, without examining its comprehensive influence on the overall decision-making process (Kabir et al., 2024). Furthermore, the relationship between AI adoption and the critical factors of decision-making efficiency such as speed, accuracy, and quality has not been extensively investigated (Sarkhosh, 2024). This gap presents an opportunity to explore how AI can enhance operational decision-making in healthcare settings, providing valuable insights for optimizing service delivery and resource management (Sharma et al., 2025).

Having previously worked in the pharmaceutical industry, the researcher observed firsthand the increasing reliance on technology to streamline operations and improve decision-making. In healthcare enterprises, where precision and speed are crucial, Artificial Intelligence (AI) has the potential to significantly enhance decision-making efficiency. By assessing AI's role in customer service, resource management, and task automation, this study aims to explore how AI adoption influences key factors such as speed, accuracy, and quality of decisions. It is the aim to contribute valuable insights into how healthcare enterprises, particularly in China, can harness AI's potential for enhanced efficiency. The experience in the pharmaceutical sector has fueled the desire to investigate AI's impact on decision-making in a context that directly decision-making efficiency.

Objectives of the study - This study aims to examine the influence of Artificial Intelligence adoption on decision making efficiency in health care enterprises in China. Specifically, it aimed to assess the extent of artificial intelligence adoption in terms of customer service, resource management, and tasks automation; determine the decision-making efficiency in terms of speed, accuracy, and quality; Test the significant relationship between AI adoption and decision making; evaluate the influence of AI adoption on decision making efficiency; and come up with an Action Plan to improve decision-making efficiency in health care enterprises.

2. Methods

Research Design - Descriptive research design was used in this paper. In summary, descriptive research is valuable in business research because it provides detailed, reliable, and contextual information about a particular situation, process, or phenomenon. It helps businesses understand the current state of affairs, identify patterns, make informed decisions, and set the stage for further analysis.

Participants of the Study - Participants of the study will come from 5 top companies in Henan Province in China. Fifty (50) employees were taken from the following companies: Henan Haiwang Medicine Group Co., Ltd; Autobio Diagnostics Co., Ltd. Zhengzhou Yonghen Pharmacy Ltd.; Henan Zhengzhou Pharmaceutical Co., Ltd.; and Zhengzhou Baixiaodan Pharmaceutical Co., Ltd, totalling 250 participants. Quota random sampling technique was used to ensure that the sample represents different roles, departments, and experience levels within the healthcare sector. The questionnaires were distributed to healthcare professionals, administrators, and decision-makers who are involved in the decision-making process and/or the use of AI within their organizations. It was distributed electronically (via email or online survey platforms) or in paper format, depending on the preferred method of data collection.

Instruments - The self- structured questionnaire will be used as a primary data collection tool to understand the impact of AI on decision-making efficiency in healthcare enterprises. Questionnaire will have two parts. Part 1 is the extent of the use of Artificial Intelligence in terms of in terms of customer service; resource management; and tasks automation. Part 2 is about Decision Making efficiency in terms of accuracy, speed and quality. This will be subjected to validation and reliability test.

Table 1.
Reliability Results

Variables	No. of Items	α value	Interpretation
Artificial Intelligence Adoption			
Customer Service	5	0.824	Good
Resource Management	5	0.748	Acceptable
Task Automation	5	0.895	Good
Overall	15	0.924	Excellent
Decision-Making Efficiency			
Speed	5	0.823	Good
Accuracy	5	0.894	Good
Quality	5	0.771	Acceptable
Overall	15	0.937	Excellent

Legend > 0.9 =Excellent; >0.8=Good:>0.7=Acceptable;>0.6=Questionable;>0.5=Poor;<0.5=Unacceptable

The reliability results indicate strong internal consistency across all variables measured under Artificial Intelligence Adoption and Decision-Making Efficiency. For Artificial Intelligence Adoption, the sub variables showed acceptable to good reliability: Customer Service had a Cronbach's alpha of 0.824, and Task Automation scored 0.895, both reflecting good reliability. Resource Management, with an alpha of 0.748, falls within the acceptable range. The overall reliability for Artificial Intelligence Adoption, combining all 15 items, is 0.924, which is considered excellent, signifying a high degree of consistency in responses across the domain. For Decision-Making Efficiency, the reliability of individual components also ranged from acceptable to good. The sub variables for Speed (0.823) and Accuracy (0.894) demonstrated good reliability, while Quality yielded an acceptable reliability score of 0.771. The overall reliability for Decision-Making Efficiency is 0.937, which is classified as excellent, indicating highly reliable responses across all its measured aspects. These results suggest that the survey instrument used to assess these constructs is statistically sound and capable of producing consistent data.

Procedure - Prior approval from the listed companies in the conduct of study were sought before the actual survey. Before the actual survey, validation of the instrument by the experts were conducted. After the validation, the paper was subjected to ethics review approval. After the approval, pilot testing was conducted to 35 participants to have the reliability test. After passing the reliability test, the questionnaires were distributed. The questionnaire responses were collected over a period of 2-4 weeks, ensuring that participants have enough time to respond. Follow-up reminders were sent to increase the response rate. Results of the survey were tallied and subject to the processing of the statistician.

Ethical Considerations - Ethical considerations were practiced in the conduct of the research. The Ethics Review of the University conducted review and approval of the paper. The researcher warrant that every information that was gathered are used for research purposes only to maintain the quality and integrity of the research. The researcher also sought the consent of the companies under study through letter and communication to make sure that the target respondents will be prepared to answer necessary questions involved in the research. It also ensured the confidentiality and anonymity of the respondents by not seeking their names as they were answering the questionnaires. The researcher also ensured that the respondents voluntarily answer the questionnaires according to their will. Lastly, it also ensured that none of the respondents of the study will be hurt or harmed and their safety and security is of top priority.

Data Analysis - Weighted mean and rank were used to assess the extent of artificial intelligence adoption in terms of customer service, resource management, and tasks automation.; and to determine the decision-making efficiency in terms of speed, accuracy, and quality; Pearson r was used to determine the significant relationship. Regression analysis was used to determine the significant predictors of decision-making efficiency. Case wise diagnostics was used to identify the outliers. All analyses were performed using SPSS version 28.

3. Results and Discussions

Table 2

Summary Table of Extent of Artificial Intelligence Adoption

Indicators	Weighted Mean	Verbal Interpretation	Rank
Customer Service	3.31	Moderately Adopted	2
Resource Management	3.23	Moderately Adopted	3
Tasks Automation	3.34	Moderately Adopted	1
Composite Mean	3.29	Moderately Adopted	

Legend: 3.50-4.00=Highly Adopted; 2.50-3.49=Moderately Adopted; 1.50-2.49=Slightly Adopted; 1.00-1.49=Not Adopted

Table 2 summarizes the extent of AI adoption in healthcare enterprises across three key operational areas: customer service, resource management, and task automation. The composite mean of 3.29 indicates that AI is moderately adopted overall. This suggests that while AI tools are becoming increasingly integrated into healthcare operations, full-scale implementation and optimization are still in progress. Tasks Automation ranked first with a weighted mean of 3.34, indicating a relatively higher acceptance and usage of AI in automating routine administrative and clinical tasks. Automation is known to significantly reduce operational workload and enhance efficiency, especially in repetitive and data-driven processes (Jagannathan, 2025). The second and third ranks were Customer Service (3.31) and Resource Management (3.23), respectively, both also rated as moderately adopted. Interestingly, Resource Management had the lowest adoption level among the three, despite its potential to optimize staffing, inventory, and facility operations. This lag may reflect the complexity and organizational hesitation in relinquishing control of resource allocation to AI-driven systems—a concern also noted by Zuo et al. (2025), who emphasized that generative AI adoption requires robust readiness and strategic frameworks.

Table 3 presents the summary of respondents' perceptions regarding decision-making efficiency in healthcare enterprises using AI. The results indicate that all three indicators—accuracy (3.24), quality (3.21), and speed (3.19)—are rated as "Efficient", with a composite mean of 3.21. Accuracy ranks highest, suggesting that AI is particularly effective in enhancing the correctness and reliability of decisions. This supports findings by Al-Rakhami et al. (2023), who emphasized that AI-powered clinical support systems significantly reduce diagnostic errors and improve data interpretation. Similarly, Nguyen et. al.,(2022) noted that AI improves decision accuracy by enabling real-time analysis and predictive insights.

Table 3

Summary Table of Decision-making Efficiency

Indicators	Weighted Mean	Verbal Interpretation	Rank
Speed	3.19	Efficient	3
Accuracy	3.24	Efficient	1
Quality	3.21	Efficient	2
Composite Mean	3.21	Efficient	

Legend: 3.50-4.00=Highly Efficient; 2.50-3.49=Efficient; 1.50-2.49=Less Efficient; 1.00-1.49=Not Efficient

Quality follows as the second-highest dimension, indicating that AI contributes meaningfully to enhancing the overall value and consistency of decisions made in healthcare settings. Chen et al. (2024) also highlighted AI's role in improving care quality by standardizing procedures and optimizing treatment paths based on data analytics. Speed, while still rated efficient, ranks third, which may suggest that although AI facilitates faster decision-making, there are still barriers such as system integration delays or initial training requirements (Rodriguez et al., 2025). Nonetheless, the technology still streamlines many time-consuming processes in hospital administration and patient care. Overall, the findings affirm that AI-driven decision-making in healthcare is efficient, with notable strengths in accuracy and quality, and slightly lower—yet still positive—ratings in speed. This supports the broader narrative that while AI is not a perfect substitute for human decision-making, it greatly enhances efficiency, consistency, and confidence in clinical and administrative contexts (Nguyen et al., 2022; Chen et al., 2024).

Table 4

Relationship Between AI Adoption and Decision-Making Efficiency in Health Care Enterprises

Variables	r	p-value	Interpretation
Customer Service			
Speed	.558**	<.001	Highly Significant
Accuracy	.721**	<.001	Highly Significant
Quality	.782**	<.001	Highly Significant
Resource Management			
Speed	.862**	<.001	Highly Significant
Accuracy	.851**	<.001	Highly Significant
Quality	.982**	<.001	Highly Significant
Tasks Automation			
Speed	.829**	<.001	Highly Significant
Accuracy	.832**	<.001	Highly Significant
Quality	.819**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Table 4 presents a highly significant relationship between artificial intelligence (AI) adoption and decision-making efficiency across three core domains within healthcare enterprises: customer service, resource management, and task automation. In the domain of customer service, AI adoption demonstrates moderate to strong positive correlations with decision-making speed (r = .558), accuracy (r = .721), and quality (r = .782), all statistically significant at $p < .001$. These results suggest that AI-enhanced systems enable faster response times, reduce human error, and improve service personalization, thus improving the overall quality of decision-making processes (Chen et al., 2024; Nguyen et al., 2022).

In the area of resource management, the relationship is even more robust, with AI adoption exhibiting very strong correlations with speed (r = .862), accuracy (r = .851), and especially quality (r = .982). These findings emphasize the critical role of AI in forecasting resource needs, streamlining inventory control, and improving the precision of logistical decisions, which is consistent with prior studies highlighting the transformative effect of AI on operational resource planning in healthcare (Al-Rakhami et al., 2023; Rodriguez et al., 2025). Similarly, in the context of task automation, AI adoption also shows highly significant positive correlations with decision-making speed (r = .829), accuracy (r = .832), and quality (r = .819). These values reinforce the notion that automating repetitive and time-consuming tasks not only expedites decision cycles but also reduces cognitive load on healthcare professionals, leading to more accurate and higher-quality decisions (Chen et. al., 2024). The findings affirm that strategic AI integration across operational processes is vital for enhancing the efficiency and effectiveness of decision-making in health enterprises.

Table 5

Predictors of Decision-making Efficiency in Health Care Enterprises

Variable	B	β	t-value	p-value	Interpretation
(Constant)	-0.232		-3.869	<.001	Highly Significant
Customer Service	0.068	0.072	2.864	0.005	Significant
Resource Management	0.731	0.658	17.734	<.001	Highly Significant
Tasks Automation	0.257	0.288	9.593	<.001	Highly Significant

Legend: Significant at p-value<0.05; F=1168.841;p=<.001; $r^2 = 0.934$

Table 10 presents the results of a regression analysis identifying the predictors of decision-making efficiency in healthcare enterprises. The model is statistically significant (F = 1168.841, p < .001) and explains a substantial proportion of the variance in decision-making efficiency ($r^2 = 0.934$). This suggests that the predictors included in the model—customer service, resource management, and task automation—account for 93.4% of the variability in decision-making outcomes. These findings highlight the critical role of AI integration in optimizing healthcare enterprise performance. Among the predictors, resource management emerges as the most influential factor (β = 0.658, t = 17.734, p < .001). This aligns with findings by Zhang et al. (2023), who emphasized that AI-driven resource allocation systems in healthcare significantly enhance operational decision-making by improving data-driven insights and reducing waste. Similarly, Chen et al. (2024) found that AI systems improve scheduling, logistics, and supply chain decisions, thereby increasing overall organizational efficiency.

Task automation also demonstrates a significant contribution to decision-making efficiency (β = 0.288, t = 9.593, p < .001). This supports the research of Alhassan et al. (2022), who reported that automating repetitive and data-intensive tasks through AI leads to faster processing and more accurate clinical and administrative decisions. Automation facilitates consistent application of guidelines and reduces human errors, especially in high-volume healthcare operations. Although customer service exhibits the smallest effect size (β = 0.072), it remains statistically significant (t = 2.864, p = 0.005). This implies that AI-enabled customer interactions—such as virtual assistants, automated triage, and chatbots—still contribute meaningfully to efficient decision-making by reducing patient wait times and improving service delivery, as supported by Rahman et al. (2025) and Lee et al. (2022). Collectively, these findings affirm that strategic AI adoption in healthcare—particularly in resource management and task automation—can substantially drive more efficient, accurate, and effective decision-making.

Table 6

Action Plan to Improve Decision Making Efficiency in Health Care Enterprises in China

Key Results Area	Strategies	Objectives of the Strategies	Persons Involved	Expected Outcomes
Speed AI-Enabled Inter-Departmental Coordination	Conduct a gap analysis of current inter-departmental communication tools and processes. Implement an AI-based workflow system that automates information sharing and task tracking between departments (e.g., AI-assisted scheduling, alerts, or case routing). Provide training on using AI coordination tools across departments.	To minimize delays and streamline communication and task handoffs between departments through intelligent automation.	IT Department, Department Heads, Process Improvement Team, HR Training	Improved real-time coordination. Reduced lag in referrals and approvals. Faster turnaround in interdependent tasks.

Quality Consistency and Quality in AI-Assisted Decision-Making	Develop standardized AI decision protocols aligned with institutional policies and clinical guidelines across all departments. Implement a centralized AI decision support system (DSS) to be used consistently across units. Conduct cross-departmental training sessions on AI decision tools to ensure consistent interpretation and application.	To enhance the reliability and quality of decisions made with AI support by ensuring uniform usage and interpretation across departments.	Medical Directors, Department Heads, IT Department, Training & Development, AI Governance Committee	increased alignment of decisions across departments; Fewer variations in practice; Improved quality and accountability in decision-making.
Accuracy Evidence-Based Decisions Using AI	Audit existing AI data sources to ensure accuracy, timeliness, and reliability. Enhance data integration systems to reduce fragmented or incomplete information being used by AI. Conduct capacity-building workshops for staff on interpreting AI data and applying it in clinical/administrative decisions. 4. Establish review protocols to verify the evidence basis of AI recommendations before implementation.	To strengthen the accuracy and credibility of AI-supported decisions by improving data quality and user understanding.	Data Management Team, IT Department, Department Heads, Training & Development Office, Quality Assurance	More accurate AI output; Increased staff confidence in AI recommendations; Improved decision-making backed by high-quality evidence.

4. Conclusions

- The Artificial Intelligence adoption in health care enterprises is moderately adopted across all indicators such as Tasks Automation, Customer Service and Resource Management.
- The overall level of decision-making efficiency in health care enterprises is interpreted as Efficient across all assessed area like accuracy, speed and quality.
- There is a highly significant positive relationship between AI adoption and decision-making efficiency in health care enterprises. across all domains—customer service, resource management, and task automation—particularly in terms of speed, accuracy, and quality.
- Resource Management, Task Automation, and Customer Service are significant predictors of decision-making efficiency in health care enterprises, with Resource Management having the strongest influence.
- A plan of Action is prepared to improve the decision-making efficiency.

Recommendations

- The Healthcare organizations may enhance infrastructure, provide targeted training, and implement pilot programs focused on customer service, resource management, and task automation to improve the adoption of AI.
- The action plan may be presented to healthcare organizations for review and possible implementation to enhance adoption of AI and improve decision-making efficiency.
- Future studies may consider examining the barriers and enablers of AI adoption using qualitative approaches to gain deeper insights into organizational readiness and user perceptions

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Human capital management practices, corporate culture and organizational resilience among hotels: Basis for high-performance culture framework

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Abstract

In the context of the hotel industry where demand fluctuations and uncertainties coexist, how to enhance organizational performance and sustainable competitiveness through the interaction of "people - culture - resilience" has become a key issue. For this purpose, this study takes the front-line formal employees of five-star hotels in Anhui Province as the subjects, and adopts descriptive research design and quantitative questionnaire methods, aiming to evaluate the current situation of human capital management practices, corporate culture and organizational resilience and their mechanism of effect on high-performance culture. The research found that respondents generally recognized that hotels performed well in human capital management practices, especially reaching an overall "agreement" level in the three dimensions of recruitment and selection, training and development, and employee relations. Corporate culture is believed to effectively promote employee empowerment, customer orientation, diversity and inclusiveness, and form relatively positive values and behavioral norms. In terms of organizational flexibility, respondents generally believe that hotels demonstrate strong performance in agility, adaptability and forward-looking thinking, and can maintain operational and service quality in the face of changes in the external environment. Correlation analysis reveals that there is a highly significant positive relationship among human capital management practices, corporate culture, and organizational resilience, indicating that a systematic management logic based on capacity supply, centered on value and behavior, and with resilience as an amplifier can collaboratively promote performance improvement. Based on this, the research proposed and constructed a "high-performance culture framework" for the hotel industry to guide enterprises in their integrated practices in talent acquisition and cultivation, cultural shaping and system implementation, as well as resilience building and continuous improvement.

Keywords: human capital management practices, corporate culture, organizational resilience, hotel, high-performance culture

Human capital management practices, corporate culture and organizational resilience among hotels: Basis for high-performance culture framework

1. Introduction

In an industry like hotels that is highly dependent on people, what truly sets the gap apart is often not a single system, but a set of "human-culture-resilience" systems that can interlock with each other. Human capital management practices address the issues of "what kind of people to bring in and how to cultivate and utilize them". Corporate culture answers "Why do we do this and which side do we stand on when faced with trade-offs?" Organizational flexibility ensures that the team can quickly adjust and stably output in the face of demand fluctuations, technological updates or unexpected events. Only when all three work in the same direction can a good service experience, stable employee status and healthy business indicators be linked into a chain, which is precisely the core of a high-performance culture.

In China's hotel industry, the diversification of human capital management (HRM) strategies and practices demonstrates its adaptability to the changing market demand and social and cultural background of emergency response (Shi et al., 2024). This diversification is not only reflected in the operation mode of hotels in different regions and of different sizes, but also reflected in the aspects of employee training, corporate culture construction, organizational flexibility development and employee commitment enhancement (Wang, 2022).

China's hotel industry generally emphasizes staff vocational training and personal development in human capital management, which is the key to improving service quality and customer satisfaction. Specifically, vocational training typically includes customer service skills, language skills improvement, and emergency response, which is designed to enable employees to better face the challenges encountered in their daily work. In the hospitality industry, this means providing not only skills training, such as front desk services, customer relationship management and language skills, but also developing comprehensive decision-making skills through leadership development and strategic thinking training. In addition, performance management systems need to be fair and transparent to ensure that employees grow and improve with clear expectations and feedback (Xie et. al.,2022).

Corporate culture plays a key role in shaping employee behavior patterns and in the decision-making process. A positive corporate culture not only defines the organizational values and beliefs, but also provides a framework in which employees can find the meaning of their actions. In the hospitality industry, a culture that emphasizes service quality and customer satisfaction can motivate employees to exceed customer expectations and deliver exceptional service. In addition, when the corporate culture emphasizes teamwork and mutual respect, employees are more likely to feel the social support for their work, thus enhancing their loyalty and commitment to the organization (Suyash, 2024). Tan (2023) pointed out that this cultural background promotes the close cooperation and mutual support among employees, helps to form a stable working environment, and improves the overall satisfaction and sense of belonging of employees. Under the influence of this culture, employees are often more willing to accept the values and goals of the organization, thus enhancing their enthusiasm and commitment to their work.

Organizational resilience describes an organization's ability to maintain core operations and recover quickly in the face of adversity. This ability is particularly important in the hospitality industry, where the industry itself often faces economic fluctuations, seasonal changes, and unpredictable market dynamics. According to Barbhuiya et al.,(2023), hotels with high organizational flexibility can quickly adjust their strategies to maintain business continuity and efficiency in the face of market fluctuations or external shocks. This resilience is not limited to the strategic level, but also includes adaptability at the employee level, where employees are flexible to adjust their behavior and work practices to respond to new job demands or environmental changes.

Existing literature has respectively discussed human capital management, corporate culture and organizational resilience. However, there is still a lack of systematic explanations and evidence on how the three interact in the hotel context and through what mechanisms they influence high-performance culture.

The researcher, who is a doctoral candidate in Management, recognizes that the capability of any organization is provided by its human resources in terms of skills, motivation, and values. However, there is still a lack of understanding about the role of human capital management practices in the hospitality sector when they are aligned with a strong and adaptive corporate culture, which can contribute to organizational resilience. The hospitality industry which is characterized by high service orientation and labor intensiveness, relies considerably on human resources and culture for the attainment of customer satisfaction, continuity of operations, and innovation during the crises.

On a personal basis, the professional background and academic interest of the researcher in the fields of organizational development and human resource management represent powerful incentives for conducting this study. The researcher anticipates that the knowledge gained from this investigation will be of assistance to both the academic and professional groups in working out people-based strategies that foster resilient and high-performing hotel staff, thus, indirectly helping to sustain competition in the hospitality industry.

Objectives of the Study - The study aimed to examine the human capital management practices, corporate culture and organizational resilience among hotels in China. Specifically, it determined the Human Resources practices as to recruitment and selection, training and development and employee relations; described the corporate culture as to employee empowerment, customer orientation and diversity and inclusion; assessed the organizational resilience as to agility, adaptability and anticipatory thinking; tested the significant relationship between human capital management practices, corporate culture and organizational resilience and developed a high-performance culture framework.

2. Methods

Research Design - This study used a descriptive research approach, combined with the means of quantitative questionnaires, aiming to collect and analyze data from different hotel staff in Anhui Province. The reasons for adopting descriptive design in this study were as follows: First, it could objectively depict the current situation of human practice, culture and flexibility of the hotel sample in Anhui in real scenarios; Second, the differences in hotel types/scales could be compared in cross-section. The distribution and correlation of the three quantifiable key indicators provided a baseline and direction for subsequent model verification and management decisions. The core aim of the study was to assess the relationship between these variables and their specific impact on employee commitment, which in turn to provide an empirical basis for hotel managers to make more targeted decisions regarding human capital strategies and organizational development.

Participants of the Study - This study aimed to explore the relationship among human capital management practices, corporate culture and organizational resilience in China's hotel industry. For this reason, the research focused on hotel employees in Anhui Province, China. The selection of research subjects was conducted in five five-star hotels in Anhui Province. The criteria for the selection of these hotels included their market influence, service scope and staff size. Anhui Province was chosen as the research site because the hotel industry in this province has grown rapidly in recent years along with the regional economic development, which is typical and of research value. In addition, the survey specifically target the regular employees of these hotels, a group that is considered to play a key role in the daily operations and cultural practices of the hotels, and can better reflect the effectiveness of the organization's human resource management and cultural characteristics.

This study adopted the method of convenient sampling to select the research subjects, with the aim of ensuring the feasibility and efficiency of the investigation. Each five-star hotel randomly selected 90 regular employees to participate in the questionnaire survey. A total of 450 employees took part in the questionnaire survey of this study to ensure the representativeness of the data and the validity of the statistical analysis. The exclusion criteria included temporary employees and outsourced staff, as these employees might not have sufficient information or sufficient engagement to reflect the hotel's regular human resource management practices and cultural characteristics. This sampling strategy aimed to enhance the accuracy and general applicability of the research results by precisely defining the research subjects and clearly defining the inclusion and exclusion criteria. Through this approach, the research results provided practical suggestions for hotel managers on how to enhance employee commitment by improving human resource management strategies and cultural construction.

Data Gathering Instruments - To achieve the study objectives, a detailed questionnaire was designed to survey hotel personnel in Anhui, China. The questionnaire was subdivided into tree major sections to systematically collect and analyze the data. First, the first part of the questionnaire focused on human capital management, such as recruitment and selection, training and development, employee relations, etc., aiming to assess the effectiveness of these practices and employee satisfaction. The second part of the questionnaire explores the specific performance of the hotel's corporate Culture, including employee empowerment, customer orientation, diversity, and inclusion. This section aims to reveal the depth and breadth of corporate Culture and how they influence employee behavior and business outcomes. The third part evaluates organizational resilience, including agility, adaptability, integrity, and expected thinking, which are key capabilities to help organizations cope with rapid changes and potential crises. The questionnaire used a four-point Likert scale—1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree—to measure perceptions of human capital management practices, corporate culture, and organizational resilience. Through this comprehensive and hierarchical questionnaire design, the study can not only obtain detailed data on each research variables, but also test the interaction between human capital management practice, corporate culture and organizational resilience and its impact on employee commitment through statistical analysis methods such as correlation analysis.

Table 1

Reliability Test Result

Indicators	Cronbach Alpha Value	Number of Items	Interpretation
Recruitment and Selection	0.823	5	Good
Training and Development	0.923	5	Excellent
Employee Relations	0.916	5	Excellent
Empowerment	0.913	5	Excellent
Customer Orientation	0.884	5	Good
Diversity and Inclusion	0.875	10	Good
Agility	0.875	5	Good
Adaptability	0.855	5	Good
Anticipatory Thinking	0.903	5	Excellent

Legend: George and Mallery (2003) provided the ff rule of thumb: ≥0.90 = Excellent; 20.80=Good; 20.70=Acceptable, 20.60 = Questionable, 20.50 = Poor, <0.50= Unacceptable

This study aimed to explore the interrelationship among human resource management, corporate culture and organizational resilience in the hotel industry in Anhui, China. The data collection processed strictly adhere to ethical standards and first obtain the necessary approvals from the ethics committee of the research institution where the data was collected. Subsequently, the researchers sent formal requests for research participation to five five-star hotels in Anhui Province, China. These requests provided detailed explanations of the research objectives and steps. After obtaining permission and support from the hotel management, the researchers used WeChat, a social media platform widely used in China, to distribute the questionnaires. This approach not only facilitated the participation of the hotel staff, but also helps to improve the response rate and the efficiency of data collection. Participants could fill in the questionnaire directly on the online platform of wechat to ensure the real-time collection and processing of data. Furthermore, the investigator continuously monitored the data collection process to ensure the completeness and accuracy of the questionnaire filling, thus providing a reliable basis for subsequent data analysis and study conclusions.

Data Analysis - Weighted mean and rank were used to determine the Human Capital Management practices as to recruitment and selection, training and development and employee relations; describe the corporate culture as to employee empowerment, customer orientation and diversity and inclusion; assess the organizational resilience as to agility, adaptability and anticipatory thinking. The result of Shapiro-Wilk Test showed that p-values of all variables were less than 0.05 which means that the data set was not normally distributed. Therefore, Spearman rho was used as part of the non-parametric tests to determine the significant relationship. All analyses were performed using SPSS version 28.

Ethical Considerations - This study strictly followed all relevant guidance from the ethics committee of the research institution and ensured that the study design met the highest ethical standards. All data collection and processing activities during the study were in accordance with China's Personal Information Protection Law (PIPL) and Data Security Law to ensure maximum respect and protection of participants' privacy. Furthermore, this study ensures that all study participants can participate on a fully voluntary basis and have the right to withdraw from the study unconditionally at any time. In the study, special emphasis was placed on protecting the physical, psychological, and economic well-being of the respondents. All study information is kept strictly confidential and any release of study findings will be anonymized to ensure that it cannot be traced back to any individual. Furthermore, all questionnaire questions in the study were designed to avoid sensitivity questions as much as possible to prevent discomfort or stress from the respondents. For employees participating in the questionnaire, the investigators provided detailed study purpose and process instructions to ensure that they fully understand the meaning and consequences of study participation and make it clear that their participation is based on the identification of the value of the study rather than any external pressure.

3. Result and discussion

Table 2

Summary Table of Human Capital Management Practices

Indicators	Weighted Mean	Verbal Interpretation	Rank
Recruitment and Selection	2.88	Agree	1
Training and Development	2.83	Agree	2.5
Employee Relations	2.83	Agree	2.5
Composite Mean	2.85	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 2 is "Summary Table of Human Capital Management Practices". The Composite Mean was 2.85, which was at the "Agree" level. This means that the sample hotels have established operational systems and basic achievements in the three major modules of human capital management - recruitment and selection, training and development, and employee relations, but have not yet reached the outstanding level of "strong consent". For the research, this result provides an overall baseline of "talent entry - capacity building - relationship bonding" in the framework of high-performance culture: the three are generally at the "qualified and available" level, but to further support organizational resilience and service innovation, a stronger closed loop needs to be formed in terms of standard consistency, learning transformation and relationship governance.

The indicator with the highest score was Recruitment and Selection (2.88, Agree). Its leading position may stem from: the external pressure from star-rated hotels on service consistency and compliance, which forces the front-end talent acquisition process to be more standardized (clear job analysis, diverse channels, and semi-structured interviews), thus achieving the first standard in "candidate supply" and "basic matching of people and positions". In addition, the combination of employee referrals and online platforms brings about visible recruitment efficiency. Relevant literature provides support. Green human resource research indicates that environment-oriented recruitment and training can enhance employees' pro-environmental commitment and self-efficacy, thereby driving positive behaviors (Alam et al., 2025), suggesting that "selective absorption + value orientation" is the starting point for forming competitiveness and sustainable performance. Meanwhile, if socially responsible HRM roles are properly defined, it can bring about positive employee outcomes, confirming the importance of clarifying expectations and responsibility boundaries during the selection stage.

The minimum values in this table are for two modules, including Training and Development (2.83, Agree) and Employee Relations (2.83, Agree). Both reached "agreement" but did not reach the peak, indicating that the training rhythm, method update and relationship governance have a foundation, but the intensity and consistency are still limited. The reasons might lie in the following: First, training is more focused on compliance and skill improvement for the current position, with insufficient transformation towards career development and ability transfer. Second, the rapid introduction of digital and algorithmic management at the front line, although it enhances process efficiency, easily brings learning load and psychological pressure, weakening training absorption and relationship bonding. Thirdly, the sense of gain from "promotion and development opportunities" in employee relations is relatively weak, and the rhythm of organizational communication and collaboration is easily squeezed by operational priorities during peak periods. In terms of evidence, Nayak et al. (2025) revealed that algorithmic HRM (AHRM) would increase stress, erode well-being and commitment, suggesting that the sole pursuit of efficiency might suppress learning outcomes and relationship quality. Sun (2024) pointed out that under the drive of "new quality productivity", hotel HRM has entered a period of rapid iteration. If the performance and training systems are not upgraded simultaneously, it is easy to have a gap of "supply but weak conversion". Shao et. al.,(2023) found that socially responsible HRM can induce role conflicts and weaken organizational citizenship behavior when the boundaries of resources and roles are unclear, which can explain the phenomenon that the relationship scores of some employees are not high. Green HRM connects training with commitment and self-efficacy, which can improve the chain of "applying what is learned" and point out the future direction of efforts. Overall, the lowest score (tied) reflects the bottleneck of "insufficient training-to-development closed loop and easy dilution of relationship governance in high-pressure scenarios", which is a key improvement point from "operational" to "high-performance culture + organizational flexibility".

Table 3

Summary Table of Corporate Culture

Indicators	Weighted Mean	Verbal Interpretation	Rank
Employee Empowerment	2.95	Agree	1
Customer Orientation	2.83	Agree	3
Diversity and Inclusion	2.88	Agree	2
Composite Mean	2.89	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 3 is "Summary Table of Corporate Culture". The Composite Mean is 2.89, which is at the Agree level. This indicates that the sample hotels have formed perceptible and executable cultural and institutional foundations in the three core cultural dimensions - Employee Empowerment, Diversity and Inclusion, and Customer Orientation. But overall, it has yet to reach the "Strongly Agree" excellent zone. The significance of the research lies in the fact that corporate culture, as the core of a high-performance cultural framework, translates human resource practices (recruitment, training, and motivation) into stable front-line behaviors and provides a "rule-trust-learning" foundation for organizational resilience. Therefore, a level of 2.89 indicates that the culture can already support daily operations, but there is still room for improvement in aspects such as participation in co-creation, experience innovation, and fair accessibility.

The highest score was for Employee Empowerment (2.95, Agree). Its leading position indicates that front-line employees have a stronger sense of "resource and information supply, authorization decision-making and encouragement from superiors", and the "hard conditions" of authorization (processes, tools, permissions) are easier to be identified and form verifiable work experiences. Why is authorization the most recognized? Firstly, star-rated hotels emphasize the industry characteristics of "service - experience - beauty", often incorporating standardized processes and job permissions into their systems, transforming authorization from slogans into executable operation scripts, thereby enhancing employees' self-efficacy in "getting things done" (Jia, 2021). Secondly, the cultural assessment of group hotels shows that the synergy between the institutional level and the behavioral level can enhance employees' consistent perception of the corporate Culture and strengthen the execution style and sense of responsibility (Li et. al.,2022). Furthermore, case studies that continuously promote historical and cultural heritage and institutional construction also demonstrate that clear values combined with standardized processes can stabilize front-line services and brand expression, indirectly enhancing the perception of authorization (Pang, 2024).

The median is Diversity and Inclusion (2.88, Agree): The weighted average shows that organizations are generally recognized for their "anti-discrimination policies, acceptance and equity activities", but the depth of moving from "compliant acceptance" to "safe voice, access to opportunities and development equity" is still limited.

The one with the lowest score was Customer Orientation (2.83, Agree). Although still within the "agree" range, it is relatively lagging behind. Hint: The front line is more inclined to maintain processes and stable supply. Under the high pressure of shifts and cost constraints, the continuous innovation oriented towards customer insights and the closed loop of "being listened to - being improved" are still not firmly established. Local studies have found that personnel mobility is closely related to training, welfare and cultural engagement. When team stability is insufficient, organizations tend to prioritize "operational stability", and customer-oriented refined improvement and cross-departmental collaboration will be compressed (Wu, 2022). Meanwhile, the proportion of "informal organizations" such as interns on the front line is not low. If there is a lack of effective guidance and feedback channels, it is easy to form a phenomenon of "only expressing within the peer circle and not entering the organizational mechanism for improvement", which weakens the conversion efficiency from customer suggestions to process optimization (Jin, 2023). In other words, the reason why customer orientation is at the bottom is not that there is a lack of value, but that the resource balance between "stable delivery" and "experience innovation" is still relatively conservative. To take it to a higher level, it is necessary to incorporate customer feedback, front-end and back-end interaction, learning closed-loop and talent stability into cultural governance.

Table 4

Summary Table of Organizational Resilience

Indicators	Weighted Mean	Verbal Interpretation	Rank
Agility	2.90	Agree	3
Adaptability	3.30	Agree	1
Anticipatory	2.94	Agree	2
Composite Mean	3.05	Agree	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 4 is "Summary Table of Organizational Resilience". The Composite Mean of 3.05 is at the "Agree" level. This indicates that the sample hotels as a whole have already established a functioning baseline for organizational resilience: under external disturbances, they can to a certain extent complete the closed loop of Adaptability, Anticipatory and Agility in process response, but the three have not yet formed an outstanding configuration of "high consistency and high synergy". The significance of the research on the high-performance cultural framework lies in the fact that the results of 3.05 suggest that human capital practices and corporate culture can already be transformed into perceptible resilient outputs. However, to further consolidate resilience into sustainable competitiveness, it is still necessary to coupling the three capabilities into replicable and scalable system capabilities.

Ranked first was "Adaptability (3.30, Agree)". The leading adaptability indicates that employees' learning and absorption of system updates, process re-engineering and technological advancements are relatively smooth. Front-line positions can transform training - practice - review into daily routines, which is in line with the fact that the hotel industry generally strengthened SOP retraining, scenario-based practice and job mentorship systems in the later stage of the epidemic. Existing studies have also shown that advancing training and organizational learning through a "multi-stage response path" during the crisis stage can significantly enhance adaptability and recovery speed (Gu et al., 2023); Meanwhile, "Resilient Leadership" emphasizes empowerment and learning orientation, which can transform employees' psychological preparedness and method transfer into adaptive advantages at the organizational level (Zhang, 2022). Two pieces of evidence jointly explain why the adaptability score in the sample is the highest: a stable mechanism centered on learning has been formed between management and the front line, enabling organizations to complete the cycle of "learning - adjustment - reinvestment" more quickly.

"Anticipatory (2.94, Agree)" is in the middle, indicating that forward-looking work - such as risk assessment, trend analysis, and early intervention at the front line - has become routine but has not yet deepened to the level of resource allocation and process re-engineering. There is still room for improvement in the synergy between it and adaptability and agility.

The lowest score was "Agility (2.90, Agree)". Although it is still within the "agree" range, it is lower than the other two items, indicating that there are still shortcomings in organization-level agility of "quick response - quick reconfiguration - quick implementation", often manifested as rapid tactical response but relatively slow strategic and cross-departmental collaboration. Literature indicates that for the organizational resilience of hotels to shift from "survival" to "development", in addition to psychological and relationship capital at the individual and team levels, it is also necessary to embed agility and innovation into processes and structures, and shorten the time lag from identification to action through structural collaboration and data-driven decision-making (Alnasser et al., 2025). On the other hand, green human resource management can enhance internal and external dual resilience and agile execution through standardized training, participation and incentives, and link environmental management with circular economy practices, thereby reducing the gap of "full identification - lagging action" (Liu et al., 2025). Furthermore, industry research in the post-pandemic period also shows that psychological and social capital at the employee level can stabilize the supply of human resources and the quality of collaboration during the period of change, providing "human" support for the implementation of agility. However, if process-side redesign is not carried out simultaneously, organization-level agility is still prone to limitations (Chong et. al.,2025). Overall, the fact that agility ranks last does not imply a lack of emergency response. Instead, it suggests that "cross-departmental configuration speed, the penetration of technology and data, as well as the synergy between systems and culture" remain the key improvement directions for the next stage.

Table 5

Relationship Between Human Capital Management Practices and Corporate Culture

Variables	rho	p-value	Interpretation
Recruitment and Selection			
Employee Empowerment	.516**	<.001	Highly Significant
Customer Orientation	.530**	<.001	Highly Significant
Diversity and Inclusion	.569**	<.001	Highly Significant
Training and Development			
Employee Empowerment	.580**	<.001	Highly Significant
Customer Orientation	.571**	<.001	Highly Significant
Diversity and Inclusion	.553**	<.001	Highly Significant
Employee Relations			
Employee Empowerment	.567**	<.001	Highly Significant
Customer Orientation	.511**	<.001	Highly Significant
Diversity and Inclusion	.522**	<.001	Highly Significant

Legend: Significant at p-value <.0.01

Table 5 shows that there is a moderately strong and highly significant positive correlation among the three dimensions of human capital management practices and corporate culture: Whether it is Recruitment and Selection, Training and Development, or Employee Relations, the correlation coefficients with Employee Empowerment, Customer Orientation, Diversity and Inclusion are all between ρ=.511 and.580, p<.001. This means that people-oriented management processes do not merely influence individual skills, but simultaneously shape organizational values and group behavioral norms, thereby providing a dual-wheel drive of "system - culture" for high-performance culture. In terms of theoretical consistency, the sustainable human resources framework for star hotels emphasizes that when HR processes are coupled with enterprise values and customer experience goals, cultural elements will be continuously reproduced in recruitment, training, and daily relationship governance (Chan et al., 2021).

In Recruitment and Selection The table is related to Employee Empowerment (ρ=.516, p<.001), Customer Orientation (ρ=.530, p<.001), Diversity and Inclusion (ρ=.569). All p<.001) showed a significant positive correlation, and the correlation intensity with diversity and inclusion was the highest. The explanation lies in the fact that the selection process that emphasizes both values and competencies binds "who can be absorbed" with "who we are" : the more the selection criteria that stress situational judgment, service empathy, and cross-cultural collaboration, the easier it is to embed empowerment, customer orientation, and an inclusive mindset at the entry threshold. Research on human resource optimization for China's star-rated hotels also points out that if the front-end "selection - matching - introduction" takes job competence and value alignment as the core, it can significantly reduce friction during the probation period and enhance organizational recognition, thereby laying the foundation for cultural implementation (Yu, 2021).

The correlations of Training and Development with the three cultural dimensions are ρ=.580 (Empowerment), ρ=.571 (Customer Orientation), and ρ=.553 (D&I) respectively, and it has the highest overall intensity among all practices. Continuous learning is the key lever for "turning culture into daily life". The mechanism lies in that training centered on problem situations, customer journeys, and cross-team collaboration can transform the experience of being empowered into stable self-efficacy and service judgments, and then diffuse into group norms through peer practices. Research against the backdrop of green HRM in the hotel industry found that structured training, employee engagement, and high-quality communication can prompt employees to take initiative to speak out and improve through the "organizational mindfulness-Harmonious passion" path, transforming management practices into a perceptible cultural climate (Murillo et al., 2024).

In terms of Employee Relations, the correlation coefficients are ρ=.567 (Empowerment), ρ=.511 (Customer Orientation), and ρ=.522 (D&I), all reaching a high degree of significance. This indicates that transparent communication, complaint and feedback mechanisms, evidence-based performance and rewards and punishments, as well as fair conflict management, will enhance employees' experience of being respected and trusted, making them more willing to take the initiative in customer contexts and reducing cross-departmental frictions through inclusive collaboration. Research based on role theory shows that socially responsible HR practices can promote voluntary and civic behaviors by reducing role conflicts and enhancing prosocial motivations, thereby consolidating the inclusive and service-oriented culture of the organization (Shao et. al., 2023). Meanwhile, domestic research on how corporate culture promotes HR performance also points out that continuous relationship governance and cultural promotion are necessary conditions for transforming institutional performance into behavioral performance (Tian, 2025).

To sum up, Training and Development is most prominent in strengthening Empowerment and Customer Orientation, demonstrating that the closed loop of learning-review-improvement directly shapes the cultural texture of "daring to make decisions and being sensitive to customers". Recruitment and Selection have the strongest relationship with Diversity and Inclusion, indicating that "recruitment oriented towards values and diverse abilities" is the entry point of an inclusive culture. Employee Relations, on the other hand, serves as the "stabilizing and diffusing" foundation function, enabling the culture to expand from the highlights of individual positions into the norm of the organization. All relationships are p<.001, further verifying the systematic path of "promoting culture through people": that is, through front-end value-oriented recruitment, process-oriented learning empowerment and continuous relationship governance, the embedding and reproduction of culture are achieved. To build a high-performance culture, hotels need to view the HR process as a cultural project: establish a selection standard that emphasizes both value and competence at the institutional level, build a training system oriented towards the customer journey and cross-position collaboration at the learning level, and ensure an open, fair and trustworthy communication order at the relationship level, so as to achieve a consistent upgrade of "people - culture - performance".

Table 6 shows that there is a moderately strong and highly significant positive correlation (all p <.001) between human capital management practices and the three dimensions of organizational resilience, indicating that people-oriented institutional design is the key underlying mechanism for hotels to withstand disturbances, make rapid adjustments and prepare in advance.

Table 6

Relationship Between Human Capital Management Practices and Organizational Resilience

Variables	rho	p-value	Interpretation
Recruitment and Selection			
Agility	.524**	<.001	Highly Significant
Adaptability	.575**	<.001	Highly Significant
Anticipatory	.547**	<.001	Highly Significant
Training and Development			
Agility	.600**	<.001	Highly Significant
Adaptability	.601**	<.001	Highly Significant
Anticipatory	.543**	<.001	Highly Significant
Employee Relations			
Agility	.493**	<.001	Highly Significant
Adaptability	.585**	<.001	Highly Significant
Anticipatory	.534**	<.001	Highly Significant

Legend: Significant at p-value <.0.01

In other words, who is recruited, how they are trained, and how the team interacts will all further translate into agile response, adaptive learning, and forward-looking planning at the organizational level by influencing individual capabilities and the quality of interaction. This transmission path of "from people to resilience" is consistent with the experience of tourism and hotel enterprises enhancing resilience through HR intervention in the context of the epidemic: Standardized human resource processes can provide stable labor relations and capacity supply at different stages before - during - after the crisis, thereby supporting the continuous operation and recovery of enterprises (Diep et al., 2021).

In Recruitment and Selection, Agility (ρ=.524, p <.001), Adaptability (ρ=.575, p <.001), and anticipatory (ρ=.547, p <.001) were all significant. And it has the strongest correlation with Adaptability. This indicates that if the entry end selects talents based on the orientation of "value fit + situational ability", it will be easier to form a team that can not only quickly switch positions for collaboration but also absorb new processes and new technologies. At the same time, the competency standards emphasizing problem prediction and risk awareness will embed "proactive thinking" into job profiles, enhancing the pre-emptive response of front-line employees to fluctuations in demand, weather conditions, and changes in customer structure. Creative self-efficacy and resilience at the employee level have been proven to positively affect the planned and adaptive resilience of enterprises and further enhance financial performance, indirectly supporting the logic of "laying the foundation for resilience with talents possessing learning and forward-looking traits" (Prayag et. al.,2023).

The correlation between Training and Development and the three dimensions is the strongest in this table: Agility (ρ=.600, p <.001), Adaptability (ρ=.601, p <.001), and anticipatory (ρ=.543, p <.001). This means that a systematic, contextualized and continuous learning mechanism is the primary lever for transforming individual capabilities into an organization's ability to be "fast, adaptable and predictive". In the post-pandemic era, research has found that integrating sustainable HRM into the training and performance cycle can significantly enhance organizational resilience and simultaneously promote the synergistic progress of social, economic and environmental performance (Mushtaq et. al.,2024). Therefore, service resilience training centered on the customer journey, job rotation learning for cross-position support, and data-based operational improvement courses will directly drive agile scheduling and adaptive iteration, and enhance proactive capabilities through scenario simulation and risk drills.

In Employee Relations, Agility (ρ=.493, p <.001), Adaptability (ρ=.585, p <.001), and anticipatory (ρ=.534, p <.001) are also highly significant. And it has the strongest association with Adaptability. The results show that transparent communication, a trusting atmosphere and fair conflict management can enhance the team's collaborative learning and mental stability in the face of uncertainty, thereby expanding "individuals being able to handle things" to "organizations being able to turn around". Evidence from the front lines of hotels and travel agencies also indicates that higher psychological resilience and life satisfaction among employees and managers can help restore work engagement and organizational trust after major shocks, thereby promoting the reconstruction of resilience at the organizational level (Elshaer, 2024). In other words, good employee relations not only enhance coordination efficiency but also provide "soft infrastructure" for adaptation and foresight through emotional and trust resources.

Overall, all three types of human capital management practices are significantly correlated with the resilience dimension, but the traction effect of Training and Development on Agility/Adaptability is the most prominent. Recruitment and Selection have the most "entry effect" on the embedding of antefixes, while Employee Relations serve as the "diffusion chassis" to stabilize the adaptation process. In terms of governance implications, a three-layer synergy of "entry point matching - on-the-job empowerment - relationship support" should be formed: ensure that forward-looking genes enter the organization through selection that emphasizes both value and ability; Training-driven agility and adaptation centered on contextualized learning and cross-domain collaboration; Ensure the closed-loop operation of learning and improvement with high-quality communication and trust mechanisms. An enterprise profile study targeting China's popular tourist cities also shows that enterprises with different levels of resilience exhibit significant differences in organizational performance, talent, and psychological capital. Optimizing human resource systems and relationship governance is the key path to crossing the levels of resilience (Li, 2024). Therefore, investing in learning and development, and forming a combination of institutionalization, value orientation and high trust in recruitment and employee relations, is the long-term strategy for hotels to cultivate and consolidate organizational resilience in the face of dynamic challenges.

Table 7

Relationship Between Corporate Culture and Organizational Resilience

Variables	rho	p-value	Interpretation
Employee Empowerment			
Agility	.545**	<.001	Highly Significant
Adaptability	.536**	<.001	Highly Significant
Anticipatory	.556**	<.001	Highly Significant
Customer Orientation			
Agility	.579**	<.001	Highly Significant
Adaptability	.578**	<.001	Highly Significant
Anticipatory	.565**	<.001	Highly Significant
Diversity and Inclusion			
Agility	.542**	<.001	Highly Significant
Adaptability	.543**	<.001	Highly Significant
Anticipatory	.571**	<.001	Highly Significant

Legend: Significant at p-value <.0.01

Table 7 shows that there is a moderate and highly significant positive correlation between corporate culture and the three dimensions of organizational resilience (all p <.001). Overall, the more clearly a culture can define its orientation of "human-customer-diversity", the better an organization can respond quickly, adapt to iterations and plan ahead in the face of external shocks. This is consistent with the conclusion of the case where Chinese hotel groups relied on culture and systems to stabilize operations during the fourth stage of the epidemic and strengthened the resilience path through digital and intelligent means, indicating that the transmission of "culture - ability - resilience" has stable extrapolation in the hotel industry (Gu et al., 2023).

In terms of Employee Empowerment, Agility (ρ=.545, p <.001), Adaptability (ρ=.536, p <.001), and anticipatory (ρ=.556, p <.001) were all significant. Numerical values show that when the front line is granted moderate decision-making power and transparent resources and information, teams are more likely to externalize "individual initiative" into a "organizational agility - adaptation - prediction" capability chain: the front end can respond quickly to demand fluctuations, the middle end can maintain learning flexibility in process and technology updates, and the back end can advance problem identification and scenario simulation. Research on resilient leadership also indicates that empowerment and trust can significantly enhance an organization's recovery and growth at different stages by improving employees' self-efficacy and crisis synergy, thereby verifying the synchronous pull of empowerment on three-dimensional resilience (Zhang, 2022).

The correlation between Customer Orientation and three-dimensional resilience is the strongest overall: Agility (ρ=.579, p <.001), Adaptability (ρ=.578, p <.001), and anticipatory (ρ=.565, p <.001). This indicates that a culture centered on customer value will force organizations to "produce based on demand and make decisions based on data", thereby enabling them to "turn around" more quickly in terms of products, processes and resource allocation, and capture demand trends and risk signals earlier. Dynamic capabilitie - The phased evidence of crisis management also indicates that the capabilities accumulated and restructured around customer touchpoints (such as integration, reconfiguration, and innovation) are precisely the key engines driving enterprises from short-term response to long-term resilience (Prayag et al., 2024). Therefore, the Customer Orientation is both the "operating system" for daily service improvement and the "perceptron" for resilient construction.

In terms of Diversity and Inclusion, Agility (ρ=.542, p <.001), Adaptability (ρ=.543, p <.001), and anticipatory (ρ=.571, p <.001) were equally significant. This means that inclusiveness and diversity not only enhance the efficiency of cross-functional collaboration, but also expand the breadth of problem expression and solution search through differences in viewpoints, enabling organizations to complete risk identification and scenario planning earlier during weak signal periods. Empirical research further reveals that green corporate Culture and circular economy practices in the hotel industry can enhance the internal and external resilience of enterprises, and the prerequisite for this is the institutionalized participation of multiple roles and fair mechanisms (Elshaer et. al.,2024). Accordingly, the marginal contribution of D&I to "predictive resilience" is particularly prominent.

Overall, all three cultural dimensions are key drivers of organizational resilience. Among them, the average correlation of Customer Orientation is the strongest, followed by Employee Empowerment. Diversity and Inclusion demonstrate their advantages in anticivism. In other words, resilient organizations do not merely rely on the accumulation of processes and technologies, but are rooted in the value foundation of "customer-oriented - empowering people - promoting innovation through diversity". Post-pandemic industry interviews also show that psychological capital and social capital can amplify the transformation efficiency of culture on resilience through trust and mutual assistance networks, helping enterprises move from "survival" to "growth" (Chong et. al.,2025). Accordingly, for hotels to continuously enhance their resilience, they should take customer orientation as the strategic anchor point, release the front-line adaptability through authorization and transparency mechanisms, and build future-oriented creative and predictive advantages with D&I, thereby achieving faster response, stronger adaptability and earlier anticipation in an uncertain environment.

High-Performance Culture Framework

In the highly uncertain and contact-intensive service context of the hotel industry, "human capital management practices - corporate Culture - organizational resilience" is not a linear chain but a ternary system that is mutually causal and effective, forming a continuous positive loop. The core mechanism can be summarized into three paths: First, HRM→ Culture: Shape the daily behavioral cues and psychological contracts of employees through "value-matching recruitment, competency-centered training and development, and employee relations characterized by fairness and transparency", and then internalize cultural elements such as "empowerment, customer orientation, diversity and inclusiveness" as group norms. Second, culture → flexibility: When empowerment and psychological safety become the "default Settings", teams are more likely to make quick decisions (Agility) in uncertainty, switch flexibly between processes and positions (Adaptability), and transform customer feedback and front-end information into early warnings and scenario plans (Anticipatory). Third, resilience →HRM: The performance of resilience (such as front-line response speed, service resilience, and innovation output) in turn accumulates into HR data and practical evidence, prompting the organization to continuously calibrate in personnel selection criteria, training content, and relationship governance, thereby iteratively strengthening the aforementioned culture and capabilities - forming a high-performance culture driven by a "data-behavior-system" closed loop.

Based on this, the operational logic of the framework is: HRM provides the "foundation" of capabilities and systems (value-oriented recruitment, training based on situational tasks/customer journeys, evidence-based recognition and communication mechanisms); Organizational culture acts as the "operating system" of behavior (authorization + customer orientation +D&I as the default rules); Organizational resilience serves as a performance "amplifier" (three-dimensional resilience translates culture and capabilities into stable quality and efficiency in a fluctuating environment). There are bidirectional and multi-directional couplings among the three: The empowerment culture not only relies on the processes and rules of HRM as a "safety net", but also strengthens resilience performance by enhancing individual self-efficacy. Resilient output, on the other hand, provides measurable feedback and redesign basis for HRM and culture. Ultimately, values are process-oriented, processes are performance-oriented, and performance in turn nourishes values, forming a replicable high-performance cultural flywheel.

This framework is aimed at hotel enterprises of different scales and business types. For large chains and groups, it can serve as a consistent governance tool across stores, helping to achieve "cultural synchronization +HR standardization + resilience co-construction" in multiple regions and brands. For small and medium-sized hotels and boutique/resort hotels, it offers a growth path of "light assets and heavy mechanisms", exchanging low-cost HRM and cultural means for the accelerated accumulation of service flexibility and customer word-of-mouth. For franchise/managed hotels, it can serve as an empowerment agreement between the headquarters and the stores, embedding brand culture, talent standards and resilience indicators into operational performance evaluations. This framework is particularly effective for hotels in digital transformation, green transformation or high-seasonally volatile markets, as it integrates technology, data and front-line authorization into a single customer-centric resilience system. In addition, other high-contact service organizations (such as exhibitions, cultural and tourism complexes, and long-term rental apartments) can also apply the same approach to achieve sustainable competitiveness that "promotes culture through people, enhances resilience through culture, and ensures performance through resilience".

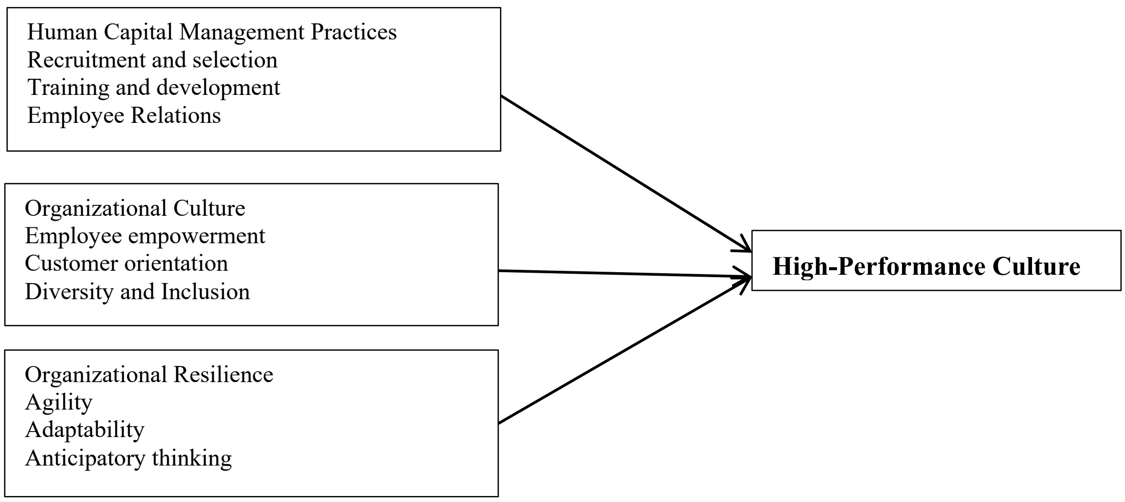

Figure 1 High-Performance Culture Framework

This framework regards human capital management practices as the "capability foundation", corporate Culture as the "behavioral operating system", and organizational resilience as the "performance amplifier". The three elements form a data-driven closed loop: value-matching recruitment, contextualized training, and fair and transparent employee relations, first converting the ability to "get things done" into reusable processes. Authorization, customer orientation and diversity inclusion translate the process into group norms of "things that are willing to do and will do right". Agility, adaptability and foresight transform norms into stable service quality and operational efficiency amid uncertainties. Resilience outputs (response speed, repurchase rate /NPS, service resilience, etc.) are then fed back into HR standards and cultural modeling, achieving an iterative flywheel of "system - behavior - result - re-system".

Align values, key behaviors, processes to results (RevPAR, GOPPAR, NPS, retention rate of key talents) with a strategic map; Drive cross-departmental collaboration with MBR/QBR; Monitor core indicators with a unified dashboard: time-to-fill, quality-of-hire, learning ROI, self-resolution rate without upgrade, VOC closed loop, D&I voice and promotion differences, 72-hour response rate, etc. Based on the iterative standard of "diagnosis - pilot - diffusion - solidification". This framework is applicable to chain groups, boutique and franchise hotels: the former achieves cross-store consistency and scale synergy, while the latter exchanges a low-cost mechanism for service flexibility and reputation growth. Ultimately, achieve a high-performance culture that shifts from "being able to do things" to "getting things done and doing the right things", supporting sustainable quality, efficiency and growth in a volatile market.

4. Conclusions and recommendations

According to the analysis and discussion of the survey data, the research findings of this study are as follows: Results of the study generally indicated that the hotel's human resource management practices performed well in the areas of recruitment and selection, training and development, and employee relations. The respondents generally agreed that the hotel's corporate culture was effective in fostering employee empowerment, customer orientation, and diversity and inclusion. The respondents generally demonstrated that hotel organizations exhibit strong performance in terms of agility, adaptability, and proactive thinking. The study revealed a highly significant relationship between human capital management practices, corporate culture, and organizational resilience. A high-performance culture framework was developed for the hotel industry.

The hotel HR manager may establish a job course map and a 70-20-10, mentorship system. They can also Implement one-on-one communication and transparent recognition, and retrospectively analyze the performance within 90 days of employment/retention rate. Hotels managers may drive synergy through the closed-loop of customer journey KPIs and VOCs. They can set targets such as "one-time resolution rate and complaint closure duration", Monthly review of customer cases and reward adopted improvements. Hotels may establish market signal boards and cross-departmental rapid response teams + SLAs; Process modularization, flexible shift scheduling and multi-skill training; The daily AAR promotion ensures that improvements are implemented within 72 hours. Future researchers may examine how hotels differ from other service sectors (e. g. A. airlines eateries and travel agencies) or venture outside of China to observe if institutional and cultural variations impact how resilience, corporate culture and human capital management interact. The high-performance culture framework may be utilized by the hotel industry in China.

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Study of Bahrain expatriate women entrepreneurs' empowerment in micro-enterprise

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Abstract

This study investigates the empowerment dynamics of expatriate women entrepreneurs engaged in micro-enterprises in the Kingdom of Bahrain. Anchored in Naila Kabeer's empowerment theory—comprising resources, agency, and achievements—and a combination of Feminist theory, the research explores how expatriate women navigate entrepreneurial pathways within a context shaped by gender norms, regulatory barriers, and cultural diversity. Using a mixed-methods design, data were gathered from seventy-one expatriate women through structured surveys and face-to-face interviews in examining key dimensions, including financial, human, and social capital; personal agency; business self-efficacy; and entrepreneurial empowerment outcomes. The findings indicate that respondents generally "agree" they have access to essential resources, particularly human capital (M=2.93), though financial access and social capital are moderately constrained. Notably, participants demonstrated high levels of perceived agency (M=3.47), especially in areas of autonomy, decision-making, and resilience. However, while business growth and community recognition showed moderate achievement, personal financial independence (M=2.48) and personal fulfillment (M=2.46) were perceived as lower, signaling a gap between entrepreneurial activity and transformative empowerment. Business self-efficacy emerged as a critical mediator, reinforcing the relationship between agency/resources and perceived success. This study highlights the multi-faceted empowerment trajectories of expatriate women micro-entrepreneurs and identifies opportunities for policy enhancements, such as inclusive access to capital, mentorship, and digital skills training. It contributes to the limited literature on expatriate women in the Gulf.

Keywords: women empowerment, expatriate entrepreneurs, micro enterprise, business self-efficacy, agency and resources

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1. Introduction

Entrepreneurship has long been recognized as a catalyst for economic development, job creation, and innovation across the globe. In both developed and developing countries, entrepreneurial activity is a significant contributor to economic dynamism and socio-cultural transformation (Chen & Makki, 2024; Usman et al., 2024). Particularly in emerging markets, entrepreneurship serves as a strategic vehicle for economic diversification, empowerment, and inclusion of marginalized groups, including women and migrants (Javadian et al., 2023). Among these groups, women entrepreneurs are increasingly shaping the entrepreneurial landscape, not only in their countries of origin but also abroad, as expatriates.

The rise of women's entrepreneurship as a key driver of economic growth has gained increasing attention in global economic and social discourse, as well as in gender-related studies (Khavarinezhad et al., 2021; Sironić & Dabić, 2025). Despite this growing recognition, women remain underrepresented and under-researched in the field of entrepreneurship. Historically, they have often been perceived as less capable of managing and expanding businesses beyond profitability and small-scale employment compared to their male counterparts. However, women entrepreneurs come from diverse backgrounds, have varied upbringings, and experience different levels of access to opportunities, markets, and resources. These factors shape their entrepreneurial journeys in unique ways, underscoring the need for more nuanced research that examines their contributions, challenges, and pathways to empowerment (Shamieh & Bastian, 2025; Vorobeva, 2022).

Expatriate women entrepreneurs represent a unique and growing segment of the global entrepreneurial community in the Kingdom of Bahrain. As globalization fosters increased mobility, more women are choosing to pursue entrepreneurial ventures outside of their home countries. Expatriate women bring with them diverse cultural experiences, professional skills, and perspectives that enrich the host country's economy. However, their journeys are often fraught with challenges such as legal and regulatory barriers, limited access to financial and social capital, and cultural adaptation difficulties. These challenges are especially pronounced for those operating at the micro-enterprise level in unfamiliar socio-economic contexts.

Bahrain, a small but strategically located nation in the Arabian Gulf, presents an intriguing context for studying expatriate women entrepreneurs. As part of the Gulf Cooperation Council (GCC), Bahrain has implemented various reforms aimed at promoting private sector growth, economic diversification, and women's participation in the labor force. Bahrain has made significant strides in empowering women economically and socially (Alsaad et al., 2023; Hatoum et al., 2023). Women now own nearly 39% of small and medium enterprises, supported by a robust ecosystem that includes government agencies such as Tamkeen and Export Bahrain, along with the Supreme Council for Women (SCW). Female entrepreneurs are reshaping the startup landscape by driving innovation in sectors like technology, fashion, education, and social ventures. Export in Bahrain reports that 30% of products and services exported originate from women-owned businesses, further reinforcing women's roles in global trade. Women entrepreneurs in Bahrain are also adopting digital tools proactively—46% use social media for sales and 41% maintain business websites, highlighting their drive for digital inclusion. These efforts collectively reflect Bahrain's commitment to enhancing women's access, autonomy, and economic participation (Alsaad et al., 2023; Hashim et al., 2024).

Historically, expatriate women in the Gulf have been viewed primarily as dependents or support systems for their working spouses. However, in recent years, this narrative has been shifting in Bahrain, where a combination of government support, regulatory reform, and community initiatives has encouraged greater participation of women—including non-nationals—in the economic sphere. While Bahraini women have benefited from numerous empowerment programs, expatriate women have had to navigate more complex paths, often shaped by residency status, labor policies, and cultural boundaries (Aref & Fallentine, 2023; Hatoum et al., 2023).

Despite these challenges, many expatriate women in Bahrain have carved out spaces of agency and resilience. They are launching home-based businesses, taking part in digital marketplaces, and engaging in cross-cultural exchanges that blend innovation with tradition (Hernández et al., 2024). Micro-enterprises—especially in sectors like food and crafts, fashion, wellness, and services—have become a common ground for these women to express their creativity and contribute meaningfully to their families and communities. In Bahrain support network comprises both formal and informal which include organizations such as women's associations, embassy-based groups, and digital platforms that offer training, mentoring, and networking opportunities. Through these, expatriate women not only gain business skills but also foster confidence, financial independence, and social empowerment. Nevertheless, Bahrain's relatively open environment compared to its regional neighbors has allowed for incremental progress. Furthermore, education, digital literacy, and social media are accelerating awareness and visibility for these women, allowing their businesses to transcend physical and cultural limitations (Alessa, 2017; Al-mani, 2020).

The Kingdom's Vision 2030 emphasizes entrepreneurship, innovation, and inclusivity as key pillars of its socio-economic development strategy. Within this landscape, micro-enterprises play a vital role in driving local economic activity, particularly in sectors such as retail, services, and food & beverage (Fatma et al., 2024). As defined by the Bahraini Ministry of Industry and Commerce, a business with up to five employees and an annual turnover between BD 1 and BD 50,000 can be categorized as a small business (Meero et al., 2020). Micro-enterprise is a critical part of the Kingdom's small and medium-sized enterprise (SME) ecosystem. The SMEs Development Board Statistics – First Quarter 2023 reveals an encouraging environment for women, including expatriates, engaging in business in Bahrain. Women comprise 39% of SME ownership, indicating a growing space for female entrepreneurs. Additionally, 30% of Bahrain's exporters are women, reflecting their active participation in global trade (Hashim et al., 2024). The ecosystem supports startups through business incubators and accelerators, with 1,170 startups having graduated, 67% of which have expanded. However, micro-enterprises often struggle to scale due to a lack of entrepreneurial qualities such as vision, networking, specialized advice, and growth strategy (Shekar et al., 2021).

In addition, the data does not disaggregate Bahraini and expatriate women specifically, but the inclusive nature of SME programs, tender opportunities, and export support suggests that expatriate women can access the same avenues of business development. Such supportive frameworks are vital in empowering women entrepreneurs and aligning with the broader goals of economic diversification and the reduction of reliance on oil revenues (Hashim et al., 2024; Seyadi & Elali, 2021). Lastly, the study seeks to fill that gap by examining the empowerment dynamics of expatriate women entrepreneurs engaged in micro-enterprises in Bahrain through a multi-dimensional lens encompassing economic, social, cultural, and institutional factors. This research will explore the lived experiences of these women, their pathways into entrepreneurship, and how entrepreneurship serves as a means of personal and professional empowerment. By doing so, the study aims to provide insights that can inform policy and programmatic interventions to support this underserved segment of the entrepreneurial population.

Statement of the Problem - This study examined the level of empowerment among expatriate women engaged in business in Bahrain. Specifically, it described the demographic profile of the respondents in terms of age, nationality, years of business experience, business sector, and business ownership. It further assessed how expatriate women evaluated their resources, including financial resources, human capital resources, and social capital resources. In addition, the study investigated the respondents' ability or agency by analyzing their decision-making capacity, autonomy and confidence, control over time and work-life balance, as well as resilience and problem-solving skills. Moreover, the study determined the respondents' level of achievement based on indicators such as business success and growth, financial independence and stability, social recognition and influence, and personal satisfaction and fulfillment. It also measured their level of business self-efficacy in terms of confidence in business management, decision-making and problem-solving, networking and market adaptation, and resilience with a growth mindset. Finally, the study tested whether significant relationships existed between resources and achievement, and between agency and achievement. It also explored the mediating effect of business self-efficacy on the relationships between resources and achievement, and between agency and achievement.

Hypotheses of the Study - The study was guided by the following hypotheses: first, that no significant relationship exists between resources and achievement; second, that no significant relationship exists between agency and achievement; and third, that business self-efficacy does not mediate the relationship between resources and achievement, nor between agency and achievement.

2. Methodology

The study employed a mix of qualitative and quantitative research designs to test the hypotheses related to Bahrain expatriate women entrepreneurs' empowerment in micro-enterprises. The respondents of the study are expatriate women in the age group of 25 to 60 years and above, who are involved in micro enterprises in the Capital Governorate, Bahrain. This study focuses on how women entrepreneurs are empowered and involved in micro enterprises, considering Retail, Food & Beverages, Manufacturing, Service, and others. The sampling units were selected using Purposive sampling. Purposive sampling was used to ensure that respondents meet the study's inclusion criteria. As of 2024, the total female population in the Capital Governorate of Bahrain is approximately 177,498. While specific data on the number of female expatriates within this governorate is not readily available, this research utilized information from the Ministry of Industry and Commerce, which estimates that 23% of women are engaged in micro-business activities. The sample size was 70 respondents minimum.

The study employed both online questionnaires (via Google Forms) and printed survey forms, and face-to-face interviews to collect data from the target group, which includes expatriate women engaged in micro-businesses, whether operating through physical stores or online platforms. Data were collected through structured questionnaires distributed to a sample of expatriate women who have been doing business in the Capital Governorate in the Kingdom of Bahrain. The questionnaire measured the five dimensions focused on Demographic Information (A) key motivations, challenges, obstacles, decision-making, legal navigation, cultural adaptation, and informal strategies, (B) Resources (C) Agency (Ability to define one's goal) (D) Achievement, (E) Business Self-efficacy Legal and Recommendations (F).

Participants in the pilot test were asked to provide feedback on the wording of questions, the overall format, and the ease of response. This feedback was systematically reviewed and used to revise the survey instrument before deploying it in the full-scale study. Data collected during the pilot were analyzed to examine preliminary reliability, including the calculation of Cronbach's alpha for internal consistency. Items with poor reliability or those noted as problematic by respondents were modified or removed as necessary. A pilot study (n=20) was conducted to test the questionnaire's clarity and reliability. The Cronbach's Alpha Test assessed internal consistency.

From the fourth week of April through the third week of May 2025, the data collection phase was actively carried out. Responses to the online surveys were monitored, and reminders were sent to participants to encourage timely completion. Printed questionnaires were collected in person or through scheduled pickups, ensuring participant convenience. Face-to-face interviews were conducted as planned, providing in-depth perspectives on the dimensions of empowerment being studied. Throughout this phase, continuous checking for completeness and accuracy of returned questionnaires were undertaken to identify any missing or unclear responses. In the fourth week of May 2025, the process were moved into the data verification and consolidation stage. All collected data, whether from Google Forms, printed surveys, or interview transcripts, were reviewed, cleaned, coded, and prepared for analysis. These data sets were securely stored and organized to maintain data integrity and confidentiality.

The study utilized appropriate statistical techniques to ensure a systematic and rigorous analysis of the data. Descriptive statistics, including frequency counts, percentages, and mean scores, were employed to summarize and describe the demographic characteristics of the respondents. These measures provided a clear overview of the participants' profiles and allowed for an organized presentation of key variables, thereby facilitating a more accurate interpretation of the data. To further examine the relationships among the variables, regression analysis was conducted to determine the extent to which empowerment factors influenced business success. This approach enabled the identification of predictive relationships and clarified how resources and agency contributed to the achievement levels of expatriate women entrepreneurs. Regression analysis also supported the evaluation of the strength and direction of these relationships, offering empirical evidence on which factors significantly shaped business outcomes. Additionally, mediation analysis was performed to test whether business self-efficacy functioned as an intervening variable between resources, agency, and achievement. This procedure helped determine whether self-efficacy enhanced, reduced, or explained the relationship between empowerment dimensions and business performance.

The study ensured adherence to rigorous ethical standards to ensure the responsible and respectful treatment of participants while maintaining research integrity. The following ethical considerations guided the study's methodology and execution. Participants were provided with comprehensive information regarding the study's objectives, procedures, potential benefits, and any associated risks. The consent process included a detailed explanation of the data collection methods (surveys) and the estimated commitment time. Participants were required to provide explicit consent, either in written or recorded verbal form, ensuring they fully understand their involvement. To accommodate linguistic diversity, study materials were made available in participants' native languages if necessary. To safeguard participants' privacy, all personal information were treated with strict confidentiality. Identifiable details were anonymized in research records, publications, and presentations to prevent the disclosure of participants' identities. Data were securely stored using password-protected digital files. In cases where complete anonymity is not feasible due to the nature of the study, participants were informed in advance and given the option to withdraw if they wish. Participation in this study was entirely voluntary, with no coercion or pressure applied. Participants kept the right to withdraw at any stage of the research without justifying. Any data collected from individuals who choose to withdraw were promptly deleted upon request, ensuring their autonomy and control over their personal information. Given the cultural diversity of expatriate women in Bahrain, the study was conducted with a high level of cultural awareness and respect.

The study employed rigorous ethical standards in data collection, analysis, and reporting to ensure objectivity and accuracy. Researchers took measures to avoid bias and presented findings transparently, without misrepresentation or selective omission of data. Any potential conflicts of interest were disclosed to maintain research integrity. This study adhered to Bahrain's legal and ethical regulations concerning business ownership, employment rights, and research practices. Where applicable, ethical approval was obtained from an institutional ethics review board or relevant regulatory authorities before starting data collection.

3. Results and discussions

Table 1

Demographic Profile of Respondents

				95% CI	
		Frequency	Percent	Lower	Upper
Nationality	Bangladeshi	8	11.27	4.23	19.72
	Chinese	1	1.41	0.00	4.23
	Filipino	19	26.76	16.90	38.03
	Indian	19	26.76	15.49	36.62
	Pakistani	13	18.31	9.86	28.17
	Saudia	5	7.04	1.41	14.08
	Thailand	6	8.45	2.82	15.49
Years of Business in Bahrain	< 1	21	29.58	14.12	46.48
	1-3	18	25.35	15.49	35.21
	4-6	17	23.94	14.08	35.21
	> 6	15	21.13	9.86	35.21
Business Sector	Beauty	1	1.41	0.00	4.20
	Food & Beverage	20	28.17	16.90	38.00

		Frequency	Percent	95% CI Lower	Upper
	Manufacturing	1	1.41	0.00	4.20
	Others	21	29.58	19.70	40.80
	Retail	26	36.62	25.40	49.30
	Services	2	2.82	0.00	7.00
Business Ownership	Partnership	55	77.46	69.00	87.30
	Sole Proprietorship	16	22.54	12.70	31.00

Note: CI = Confidence Interval, N=71 Bootstrap Sample = 1,000

The study gathered demographic data from 71 expatriate women entrepreneurs in Bahrain who are engaged in micro-enterprises. The profile provides insights into their national backgrounds, years of business operation, industry sectors, and business ownership structures. The participants represented diverse nationalities, with the highest representation from Filipino (26.76%) and Indian (26.76%) entrepreneurs, each constituting over a quarter of the respondents. Pakistani nationals made up 18.31%, followed by Bangladeshi (11.27%), Thai (8.45%), Saudi (7.04%), and a single Chinese respondent (1.41%). The 95% confidence intervals indicate a relatively wide variation in the population estimates, especially for underrepresented groups, suggesting potential demographic diversity but also sample limitations.

In terms of entrepreneurial experience, the largest proportion (29.58%) had been in business for less than one year, highlighting the significant presence of newly established micro-enterprises. Those with 1–3 years and 4–6 years of experience accounted for 25.35% and 23.94%, respectively, while 21.13% had been operating for more than six years. This distribution shows a balanced mix of new and moderately experienced entrepreneurs, with a slightly higher proportion of newer ventures. The business sector revealed a concentration in retail (36.62%), which is the dominant industry among respondents. This was followed by the “Others” category (29.58%), which may include informal, miscellaneous, or unspecified trades. The food and beverage sector was also notable at 28.17%. Smaller percentages were engaged in services (2.82%), beauty (1.41%), and manufacturing (1.41%). The high involvement in retail and food-related ventures reflects common micro-enterprise pathways for expatriate women in Bahrain. The vast majority of businesses (77.46%) were operated through partnerships, indicating a preference or necessity for shared ownership models, possibly due to financial, legal, or support system factors. Only 22.54% were run as sole proprietorships, suggesting relatively fewer women independently own and manage their businesses.

In summary, the demographic profile indicates that Bahrain’s expatriate women entrepreneurs are predominantly from South and Southeast Asia, particularly the Philippines and India. Most are engaged in recently established retail and food-related micro-enterprises, operating largely in partnership structures. These findings provide a contextual foundation for understanding the empowerment dynamics explored in the study, especially in relation to access to resources, agencies, and business self-efficacy.

Resources Summary - The **Resources** construct, which encompasses **Financial**, **Human Capital**, and **Social Capital** resources, reflects the overall access and support systems available to expatriate women entrepreneurs managing micro-enterprises in Bahrain. The construct yielded a **mean score of 2.84** (out of 4.00) with a relatively low **standard deviation of 0.31**, indicating a consistent perception among respondents. The general interpretation falls under **"Agree,"** signifying that participants perceive themselves to have a moderate level of access to the key resources needed for entrepreneurial success.

- **Human Capital Resources** scored the highest mean (**2.93**), indicating that respondents feel relatively more confident in their personal skills, access to mentorship, and business networks.
- **Financial Resources** and **Social Capital Resources** showed comparable means of **2.81** and **2.80**, respectively, suggesting that while access to funding, training, social networks, and support groups exists, it may still be somewhat limited or inconsistent for some entrepreneurs.

The narrow range between the minimum and maximum values across all subcomponents indicates a balanced distribution of perceptions across the sample, with no extreme disparities. The summary reveals that while expatriate women entrepreneurs in Bahrain generally agree they have access to essential resources, there remains room for improvement, particularly in expanding access to financial services, strengthening inclusive networks, and enhancing the visibility and support of social capital in the entrepreneurial ecosystem.

Table 2

Summary of Resources Construct

Construct	Mean	Std. Deviation	Interpretation
Financial Resources	2.81	0.58	*Agree*
Human Capital Resources	2.93	0.56	*Agree*
Social Capital Resources	2.80	0.51	*Agree*
RESOURCES	2.84	0.31	*Agree*

Summary of Agency Descriptive Statistics - The construct Agency, which encapsulates the psychological and behavioral dimensions of empowerment, was evaluated using four key indicators: Decision-Making Power, Autonomy & Confidence, Control Over Time & Work-Life Balance, and Resilience & Problem-Solving. All indicators yielded high mean scores ranging from 3.40 to 3.51, falling within the interpretive range of "Strongly Agree", thereby indicating a consistently high level of perceived agency among the respondents. Specifically, Resilience & Problem-Solving had the highest mean score (M = 3.51, SD = .353), highlighting the expatriate women's strong capacity to adapt and address challenges in entrepreneurial contexts. This was closely followed by Autonomy & Confidence (M = 3.49, SD = .259) and Control Over Time & Work-Life Balance (M = 3.48, SD = .373), which reflect their self-assurance and effective management of professional and personal responsibilities. The indicator Decision-Making Power had the lowest mean within the group (M = 3.40, SD = .283), though it still falls within the "Strongly Agree" category, suggesting a robust but relatively less dominant perception of influence over business decisions.

The overall composite mean for Agency was 3.47 with a low standard deviation (SD = .153), suggesting a high level of agreement across respondents with little variability. This indicates that the respondents uniformly perceive themselves as empowered agents in their entrepreneurial endeavors, possessing both the confidence and resilience to navigate their micro-enterprises effectively. These results collectively underscore that expatriate women entrepreneurs in Bahrain experience a strong sense of personal agency, which is foundational to their empowerment in the micro-enterprise sector. This strength in agency suggests their readiness to take initiative, maintain autonomy, solve problems independently, and balance their personal and professional responsibilities—key attributes that support their entrepreneurial success and sustainable economic participation.

Table 3

Summary of Agency Construct Descriptive Statistics

Construct	Mean	Std. Deviation	Interpretation
Decision-Making Power	3.40	.283	*Strongly Agree*
Autonomy & Confidence	3.49	.259	*Strongly Agree*
Control Over Time & Work-Life Balance	3.48	.373	*Strongly Agree*
Resilience & Problem-Solving	3.51	.353	*Strongly Agree*
AGENCY	3.47	.153	*Strongly Agree*

Summary of Achievement Descriptive Statistics - The summary of achievement descriptive statistics indicated that expatriate women entrepreneurs generally perceived themselves as achieving positive business outcomes, as reflected in the overall mean score of 2.60, interpreted as "Agree." This finding suggested that respondents recognized measurable progress in their entrepreneurial activities, particularly in operational performance and financial capability. The relatively moderate standard deviation (0.74) further implied a reasonable level of consistency in how respondents viewed their achievements, although some variation in experiences remained evident.

Among the dimensions, Business Success and Growth obtained the highest mean score (M = 2.79, SD = 0.59), signaling that most respondents believed their enterprises were expanding or performing satisfactorily. The low variability suggested that growth-oriented outcomes were commonly experienced across the sample, reinforcing the idea that expatriate women were capable of navigating competitive business environments despite structural and cultural challenges often associated with operating in a foreign country. This result aligned with empowerment perspectives that emphasize access to resources and strategic decision-making as drivers of entrepreneurial progress. Financial Independence and Stability also received an "Agree" interpretation (M = 2.56, SD = 0.55), indicating that business ownership contributed to stronger financial control and economic participation. However, the slightly lower mean compared to business growth may imply that while enterprises were functioning well, consistent financial security had not yet been fully realized for all respondents. This pattern is typical in entrepreneurial contexts where revenue growth does not immediately translate into long-term financial resilience due to reinvestment demands, operational costs, or market fluctuations.

In contrast, Personal Satisfaction and Fulfillment registered a mean of 2.46 with a notably high standard deviation of 1.09, interpreted as "Disagree." This divergence revealed an important insight: entrepreneurial success did not automatically equate to personal well-being. The large variability suggested polarized experiences—some respondents may have found business ownership deeply rewarding, while others likely encountered stress, work-life imbalance, social isolation, or the pressures of operating abroad. This outcome underscored a critical dimension of empowerment often overlooked in purely economic analyses: psychological and emotional fulfillment.

Table 4

Summary of Achievement Descriptive Statistics

Construct	Mean	Std. Deviation	Interpretation
Business Success & Growth	2.79	0.59	*Agree*
Financial Independence & Stability	2.56	0.55	*Agree*
Personal Satisfaction & Fulfillment	2.46	1.09	*Disagree*
Achievement	2.60	0.74	*Agree*

Summary of Business Self-Efficacy **-** The data illustrates the self-perceived **business self-efficacy** of women expatriates engaged in entrepreneurial activities in Bahrain. The overall **Efficacy** score, with a mean of **2.65** and a standard deviation of **0.39**, reflects a general agreement among respondents regarding their confidence in managing business responsibilities, despite being in a foreign cultural and economic environment. In detail:

- **Confidence in Business Operations** yielded a mean of **2.64** (SD = 0.68), suggesting that these expatriate women feel moderately confident in handling the day-to-day operations of their businesses in Bahrain, which may include managing resources, complying with local regulations, and maintaining service quality.

- **Decision-Making & Problem-Solving** had a slightly lower mean of **2.58** (SD = 0.69). This indicates that while the women agree on their ability to make informed decisions and solve problems, this area may still be influenced by challenges such as limited local networks, cultural barriers, or unfamiliarity with Bahrain's legal and market systems.

- **Networking & Market Adaptation** showed the highest mean score at **2.70** (SD = 0.79), which is a promising indication that these women are actively engaging in building connections and adjusting their business strategies to fit Bahrain's unique business climate. This adaptability is essential for sustaining competitiveness and growth as a foreign entrepreneur.

The results reflect a positive yet cautious level of business self-efficacy among women expatriate entrepreneurs in Bahrain. While they generally believe in their entrepreneurial capabilities, specific areas—especially decision-making in a foreign context—may benefit from mentoring, local support systems, and targeted training to further empower these women in their business journeys.

Relationship of Resources, Agency, Self-Efficacy, and Achievement **-** The study reveals how these variables interact and influence one another in the context of women navigating entrepreneurship and empowerment in a foreign cultural environment. The analysis revealed a significant negative correlation between Resources and Agency ($r = -0.238$, $p < 0.05$). This finding suggests that as access to resources increases, women's sense of agency tends to decrease. In practical terms, this could mean that while support systems, financial capital, or external assistance may be available, they may inadvertently lead to a reduced feeling of self-reliance or control. This could be attributed to a dependency on external support structures rather than fostering autonomous decision-making, especially in a foreign environment where legal, cultural, or societal constraints may influence personal agency.

On the other hand, a significant positive correlation was found between Achievement and Efficacy ($r = 0.283$, $p < 0.05$). This relationship indicates that the more these women experience success or reach personal and professional goals, the more confident they become in their abilities to manage challenges and make effective decisions. This finding aligns with existing empowerment theories, suggesting that successful experiences are instrumental in reinforcing self-efficacy and long-term motivation, particularly in entrepreneurial or leadership roles. The correlations between the other variables, namely Resources and Achievement, Agency and Achievement, and Agency and Efficacy, were weak and statistically insignificant. This indicates that, within this sample, these variables may not be directly linked or influenced by one another in meaningful ways.

In summary, the correlation analysis provides valuable insights into the empowerment dynamics of women expatriates in Bahrain. The positive impact of achievement on efficacy highlights the importance of recognizing and celebrating successes to build confidence and resilience. Meanwhile, the inverse relationship between resources and agency calls for a critical evaluation of how support systems are structured, ensuring they empower rather than diminish autonomy. These findings underscore the need for programs and policies that both support and strengthen the independent capacities of women expatriates as they navigate business and personal growth in a host country.

Table 5

Correlations among Resources, Agency, Self-Efficacy, And Achievement

	1	2	3	4
1. RESOURCES				
2. AGENCY	**-.238***			
3. ACHIEVEMENT	-0.025	0.028		
4. EFFICACY	-0.004	0.023	**.283***	

**. Correlation is significant at the 0.05 level (2-tailed).*

Impact of Resources and Agency on Business Achievement Mediated by Self-Efficacy - This mediation analysis explores whether Self-Efficacy serves as a mediating factor between Resources & Agency and Achievement among women expatriates in Bahrain. The intent is to examine if the availability of resources and personal agency can influence achievement directly or indirectly through one's belief in their own capability (self-efficacy). The analysis reveals that the indirect effect of Resources & Agency on Achievement through Self-Efficacy is very weak (0.007) and not statistically significant. This suggests that Self-Efficacy does not serve as a meaningful bridge in the relationship between these variables within this context.

Specifically, the path between Resources & Agency and Self-Efficacy yielded a negligible correlation ($r = 0.023$, $p = 0.983$), indicating that the availability of resources and the feeling of control or influence over decisions do not significantly impact the women's belief in their own business capabilities. Meanwhile, the path from Self-Efficacy to Achievement showed a moderate correlation ($r = 0.283$), suggesting a potential relationship, but it was not statistically significant ($p = 0.170$). This implies that while women with higher self-efficacy may feel more accomplished, the relationship is not strong enough to draw firm conclusions based on the data. The direct effect of Resources & Agency on Achievement was also very weak ($r = 0.034$, $p = 0.961$), reinforcing the finding that resources and agency alone are not direct predictors of achievement outcomes for this group. Overall, the total effect was minimal (0.041), confirming that neither a direct nor indirect pathway meaningfully explains achievement among women expatriates in this sample.

The findings suggest that Self-Efficacy does not significantly mediate the relationship between Resources & Agency and Achievement for women expatriates in Bahrain. This outcome implies that other factors may play a more crucial role in fostering achievements such as cultural adaptation, emotional resilience, mentorship, or local institutional support. Future programs aimed at empowering expatriate women should consider a broader range of psychological, social, and structural influences to effectively support their personal and professional growth. This outcome may reflect that other unmeasured variables—such as cultural adaptation, community support, emotional resilience, or policy environment—might play a more central role in driving achievement outcomes for this group.

Table 6

Direct, Indirect, and Total Effect of Resources and Agency on Business Achievement Mediated by Self-Efficacy

Path	Relationship	Pearson r	Significance (p-value)
A	Resources & Agency → Self-Efficacy	0.023	0.983
b	Self-Efficacy → Achievement	0.283	0.17
c	Direct: Resources & Agency → Achievement	0.034	0.961
	Indirect Effect (a × b)	0.007	*not significant*
	Total Effect (Direct + Indirect)	0.041	*not significant*

4. Findings, implications, and recommendations

The study aimed to investigate the relationship between Resources and Achievement among women expatriates in Bahrain, with Self-Efficacy considered as a potential mediating variable. Complementary to the mediation results, descriptive analysis of the key constructs was also conducted. Descriptive Findings:

- Resources - All dimensions under this construct—Financial (M = 2.81), Human Capital (M = 2.93), and Social Capital (M = 2.80)—received an overall interpretation of "Agree". This indicates that most respondents moderately perceived themselves as having access to resources essential for their business operations.
- Agency - The construct scored highly across all sub-dimensions, with an overall mean of 3.47, interpreted as "Strongly Agree." This implies a high level of self-belief, decision-making power, autonomy, and resilience among the women, despite being in a foreign context.
- Self-Efficacy - With a mean of 2.65, respondents "Agreed" that they are confident in managing their business, solving problems, and adapting to the market. This suggests moderate belief in their business competence.
- Achievement - The construct received an average interpretation of "Agree" (M = 2.65), with Personal Satisfaction scoring the lowest (M = 2.46, "Disagree"). This shows that while women may experience growth, success, and recognition, they may still lack personal fulfillment in their entrepreneurial journeys.

Mediation Model Findings

- The indirect effect of Resources & Agency on Achievement through Self-Efficacy was insignificant (0.007).
- The direct effect (Resources & Agency → Achievement) was very weak (r = 0.034, p = 0.961).
- The path from Self-Efficacy to Achievement was moderately positive (r = 0.283) but not statistically significant (p = 0.170).
- These results suggest that Self-Efficacy does not significantly mediate the relationship between Resources & Agency and Achievement in this context.
- Total effect of all paths was minimal (0.041), reinforcing the conclusion that the measured constructs

alone do not fully explain the variance in perceived achievement.

Implications - The findings challenge linear empowerment models that assume access to resources and agency naturally lead to achievement through self-efficacy. Achievement appears to be more complex and multidimensional, suggesting that traditional empowerment frameworks may not fully capture the experiences of expatriate women in the Gulf context. Programs targeting women expatriates must go beyond resource provision. Soft skills development, emotional support, and life satisfaction enhancement should be integrated into entrepreneurship development programs to ensure sustainable impact. Policymakers in Bahrain and similar host countries must consider creating inclusive entrepreneurial ecosystems that support expatriate women not just economically, but psychosocially and culturally. Long-term policies should support holistic empowerment, focusing on personal fulfillment, not just economic output.

Recommendations - Based on the findings, the following strategies are recommended:

- Support Personal Fulfillment and Well-Being - Since Personal Satisfaction & Fulfillment scored the lowest under Achievement, programs should include personal growth coaching, emotional resilience training, and community engagement activities that foster holistic well-being, not just professional success.

- Provide one-on-one or small group coaching sessions that help women clarify their values, build confidence, and develop a positive sense of self-worth beyond business success. Organize workshops focused on coping strategies, self-care practices, and mental health awareness, addressing the unique challenges faced by expatriate women in a foreign cultural and legal environment. Incorporate coaching methods that encourage life balance, stress management, and setting personal as well as professional goals

- Enhance Self-Efficacy through Skills-Based Interventions - Create targeted training in problem-solving, leadership, innovation, and adaptability to improve confidence, especially for new or early-stage expatriate entrepreneurs. Develop targeted training in business skills, financial literacy, and digital marketing tailored for expatriate women entrepreneurs. Support public campaigns that build awareness of the economic contributions of expatriate women micro-entrepreneurs to foster a positive perception among the local community. Develop opportunities for social networking and community-building among expatriate women, such as peer-support groups, interest-based clubs, or community volunteering initiatives.

- Strengthening Cultural Integration Programs - Implement cultural adaptation initiatives (e.g., mentoring by local women, cross-cultural workshops) to help expatriates feel more connected, reducing the potential emotional isolation that might limit personal satisfaction and confidence. Mandate training for government staff and regulatory agencies on cultural sensitivity and gender responsiveness when working with expatriate women entrepreneurs. In addition, offer translation services and culturally appropriate outreach to overcome communication barriers and increase participation in support programs.

- Review Support Systems for Empowerment Alignment - Ensure that financial, social, and human capital support systems provided to expatriate women are empowerment-focused—not merely resource-based—by incorporating participatory decision-making and mentorship. Facilitate mentoring programs linking successful women entrepreneurs (both expatriate and Bahraini) to less experienced micro-entrepreneurs to promote knowledge sharing and empowerment.

- Conduct Further Research with Expanded Variables - Future studies should explore other mediators such as emotional intelligence, cultural adaptation, psychological safety, and family support to better explain what drives true achievement and satisfaction for women in foreign entrepreneurial settings.

Furthermore, by conducting comparative studies in other GCC countries to identify regional patterns and best practices that will help to improve weaknesses and threats. Lastly, by designing longitudinal studies to track how expatriate women micro-entrepreneurs develop over time and respond to policy or market changes.

- Simplify Licensing for Expatriate Micro-Enterprises and Strengthen Legal Protection- Streamline registration and licensing requirements for expatriate women running micro-businesses to reduce administrative burdens and encourage formalization. Extend entrepreneurial programs, subsidies, and financing opportunities to expatriate women micro-entrepreneurs, not just to Bahraini nationals, to create a more inclusive ecosystem. Review and strengthen legal frameworks protecting the rights of expatriate women entrepreneurs, including anti-discrimination policies and dispute resolution mechanisms.

- Support Agencies and NGOs (including Embassies, Tamkeen, etc.)- Establish partnerships with community leaders and cultural ambassadors to encourage trust and engagement with expatriate communities. Create secure, anonymous reporting and feedback mechanisms so expatriate women can safely share their needs and challenges without fear of repercussions.

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Customer service orientation and ethical behavior influencing the quality management practices among resort in the Central Luzon Region

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Abstract

The resort industry in Central Luzon is highly competitive, necessitating differentiation through superior customer experiences. However, limited research exists on the interrelationship between customer service orientation, ethical behavior, and quality management practices in this sector. This study investigates the impact of organizational culture, business strategy, and ethical leadership on employee perceptions of customer service orientation within a resort setting. The researcher utilized a descriptive quantitative research design to obtain customer service orientation and ethical behavior influence the quality management practices among resort hotels in Central Luzon, as assessed by resort employees using a survey questionnaire distributed via Google Forms or gathered personally. A total of 150 resort employees were identified as study respondents using purposive sampling. The weighted mean and ANOVA were utilized to determine whether there were significant differences in quality management practices across different resorts. The result of the study revealed that continuous employee training, clear communication, and ethical leadership were significant in promoting high service standards and fostering a positive organizational culture. Resorts can improve their quality management procedures, raise client happiness, and foster an environment of integrity and trust among staff and clients by creating a positive work environment as part of the development plan.

Keywords: resort industry, Central Luzon, customer service orientation, ethical behavior, quality management practices, organizational culture, service quality

Customer service orientation and ethical behavior influencing the quality management practices among resort in the Central Luzon Region

1. Introduction

Resorts are recognized as specialized destinations that provide accommodations, amenities, and recreational activities tailored for vacationers and travelers seeking leisure and relaxation. These establishments are strategically located across diverse environments, including tropical islands, mountainous regions, coastlines, and urban centers. In the Philippines, and more specifically in Central Luzon, the resort industry has evolved significantly to align with the dynamic preferences of contemporary travelers. In response to global tourism trends, regional resorts are adopting innovative strategies to enhance guest experiences and differentiate themselves within an increasingly competitive market. One of the most prominent trends reshaping the resort industry is the growing emphasis on sustainable tourism. In this context, many resorts are integrating environmentally responsible practices, such as using energy-efficient technologies, comprehensive waste management systems, and locally sourced materials. These initiatives aim not only to reduce environmental impact but also to support the welfare of surrounding communities. The rising demand for wellness tourism has led resorts to expand their service offerings to include spa treatments, yoga sessions, and holistic health programs. These wellness services cater to the health-conscious segment of travelers while positioning the resort as a sanctuary for physical and mental rejuvenation.

In addition to sustainability and wellness, technology integration plays a critical role in transforming the modern resort experience. By adopting mobile applications, digital key cards, and online booking systems, resorts are streamlining operations and elevating the convenience of the guest journey. As travelers increasingly seek meaningful and authentic cultural encounters, many resorts in Central Luzon have begun offering experiences such as traditional cooking classes, local heritage tours, and indigenous cultural performances. These immersive activities enrich the guest experience and celebrate the region's unique cultural identity.

The rise in family-oriented travel has prompted resorts to enhance their facilities to cater to guests of all ages. Family suites, children's play areas, and kid-friendly pools are now standard features, making resorts more accessible and enjoyable for multi-generational travel. Given these developments, Central Luzon—situated in the northern part of Luzon Island—has emerged as a premier resort destination. Known for its natural beauty, cultural heritage, and accessibility, the region hosts notable locations such as Subic Bay in Zambales and Clark Freeport Zone in Pampanga. Subic Bay, renowned for its beaches and marine activities like snorkeling and island-hopping, contrasts with Clark’s upscale offerings, including Midori Clark Hotel and Casino and Royce Hotel and Casino. Many eco-friendly and wellness-centered resorts, such as The Farm at San Benito and Quest Plus Conference Center, have recently gained prominence for their commitment to sustainability and well-being.

Given the intensified competition and evolving guest expectations, it has become increasingly crucial for resort businesses to focus on delivering high-quality services and offering distinctive and memorable experiences. This competitive landscape forms the foundation for the present study, investigating the interrelated roles of Customer Service Orientation (CSO), Ethical Behavior, and Quality Management Practices (QMP) in shaping service quality and organizational performance within Central Luzon’s resort industry. Despite the growing relevance of these three elements, limited scholarly attention has been given to how they interact within this specific regional context. Addressing this gap, the study aims to contribute empirical insights into how CSO and ethical behavior influence the implementation and effectiveness of QMP.

To elaborate, Customer Service Orientation (CSO) refers to an organization’s and individual employees’ commitment to consistently delivering exceptional service. It encompasses behaviors, attitudes, and systemic approaches centered on understanding and satisfying customer needs. In the hospitality sector, CSO is foundational to building guest loyalty, enhancing brand reputation, and fostering repeat visits. Research indicates that companies with a strong customer-oriented culture often surpass competitors in terms of service quality and customer satisfaction.

Ethical behavior is closely associated with CSO, which entails adherence to moral principles and professional standards in all workplace conduct. Within the resort setting, this includes transparent advertising, fairness in employee management, respect for guests' privacy and dignity, and responsibility toward environmental sustainability. Ethical behavior strengthens trust between employees and guests, reduces potential for disputes, and fosters a positive internal culture. It is also critical in maintaining long-term customer loyalty, staff retention, and corporate integrity. On the other hand, Quality Management Practices (QMP) refer to the structured implementation of policies, procedures, and continuous improvement efforts to achieve consistent and high-quality service delivery. These practices may involve staff training programs, performance monitoring, customer feedback mechanisms, and leadership involvement. Effective QMP is crucial to ensuring operational excellence and competitive positioning in the hospitality industry. Resorts that invest in robust quality systems are more likely to deliver superior guest experiences, secure positive reviews, and foster customer loyalty.

Although existing studies have independently explored CSO, ethical behavior, and QMP, a clear gap remains in the literature regarding the combined influence of these factors in the resort operations of Central Luzon. Thus, this research aims to examine the interrelationships among these variables and determine their collective impact on service delivery and organizational success. The study responds to the increasing need for Philippine resorts to uphold higher service standards, embrace ethical practices, and implement strategic quality management systems. As guest expectations evolve, it is no longer sufficient to meet basic service requirements; resorts must consistently exceed expectations through excellence in service, ethical responsibility, and operational efficiency.

The rationale for this research is further supported by several studies conducted within the context of the Philippines. For example, Reyes et al. (2019) found that a strong customer-oriented culture among hotel frontliners in Batangas City increased guest satisfaction and retention, emphasizing the importance of effective communication, attentiveness, and staff training. Dela Cruz (2021) reported similar results in Puerto Galera, where customer-centric behaviors such as empathy and responsiveness fostered strong guest relationships and favorable online reviews. In terms of ethics, Santos et al. (2020) revealed that transparency, honesty, and respect for privacy in Metro Manila's hospitality sector positively influenced customer trust and loyalty, while unethical practices, such as hidden charges and discriminatory treatment, severely damaged brand reputation. Likewise, Garcia (2018) demonstrated that ethical leadership in Quezon City hotels influenced employee behavior, creating a culture of integrity and professionalism that positively affected guest interactions.

International literature also reinforces the importance of CSO, ethical behavior, and QMP in the hospitality sector. Situmeang et al. (2024) emphasized that customer orientation significantly enhances service quality and satisfaction, increasing customer loyalty. Huzaifa et al. (2024) further confirmed that ethical leadership and organizational values drive employee performance and improve customer service. Meanwhile, Liu et al. (2020) identified that quality management elements—process management, supplier quality, and human resource development—are essential for achieving consistent service excellence, particularly within the Philippine hospitality industry. Supporting this, Lopez et al. (2023) applied the SERVQUAL model in Quezon Province's casual dining sector and found that assurance and empathy were critical factors in customer retention.

By synthesizing insights from both local and international studies, this research proposes an integrated framework that positions CSO, ethical behavior, and QMP as mutually reinforcing elements in enhancing guest satisfaction and organizational success. This integration offers a comprehensive perspective for evaluating resort performance and developing practical solutions. Specifically, hospitality organizations can benefit from cultivating a culture that emphasizes customer orientation, upholds ethical standards, and implements consistent quality management systems. Training programs focused on ethical decision-making, service excellence, and leadership that model these values can create a supportive organizational environment. Resort managers can significantly improve service delivery, foster deeper customer loyalty, and secure long-term business growth by aligning practices with customer expectations and moral norms.

The scope of the current study centers on examining the relationships among CSO, ethical behavior, and QMP within resorts operating in the Central Luzon region of the Philippines. It particularly investigates how employee characteristics, organizational climate, leadership styles, business strategies, professional standards, and operational policies affect the implementation and outcomes of quality management practices. However, it is essential to acknowledge the limitations of the study. These include restricted generalizability due to the geographic focus on Central Luzon, potential response bias from self-reported data, and the cross-sectional nature of the research design, which may limit causal interpretations. Additionally, ethical behavior and organizational climate variables are inherently subjective and may vary based on individual perceptions. Finally, external factors—such as political, economic, or social conditions—unique to the Central Luzon region could influence the interpretation of the results.

This study aims to fill a critical gap in resort management literature by exploring the interconnected roles of customer service orientation, ethical behavior, and quality management practices. Through carefully examining these variables within the Central Luzon context, the research aspires to generate actionable insights for resort managers and contribute to the broader discourse on sustainable and customer-centered hospitality.

Objectives of the Study - This study aims to assess the influence of employees' customer service orientation and ethical behavior on quality management among resorts in the Central Luzon Region and to provide insights relevant to this region's hospitality and tourism industry by focusing on this specific geographical area. More specifically, it aims to seek the following: to assess the customer service orientation of the employees in terms of employee characteristics/ attributes, organizational climate culture, and business strategy; to assess the ethical behavior of employees regarding ethical leadership, rules and policies, employee independence, law and professional standards, and ethical behavior; to determine the total quality management practices of the resort in terms of customer focus, supplier quality management, continuous improvement, leadership, employee fulfillment, training and development, and process management; to test the significant relationship among customer service orientation, ethical behavior, and quality management practices; to propose a quality management framework for resorts.

2. Method

Research Design - This study utilized a descriptive quantitative research design to examine how customer service orientation and ethical behavior influence the quality management practices among resort hotels in Central Luzon, as assessed by resort employees. Descriptive quantitative research design is a research methodology used to describe a population, group, or phenomenon by gathering and analyzing numerical data. According to Lin, et al. (2022), the primary aim of descriptive research is to provide a comprehensive overview of a particular topic or situation. This research design typically involves collecting data through surveys, questionnaires, or observation. The collected data is then analyzed using statistical methods such as mean, median, and mode to summarize the information gathered. The results of this type of research can be used to conclude about the population or group being studied. Descriptive quantitative research is beneficial when researchers want to understand the characteristics of a particular group, such as age, gender, or socioeconomic status. It is also helpful when studying trends or patterns over time. This research design is often used in social science, marketing, and healthcare research. Overall, the descriptive quantitative research design effectively provides a detailed overview of a specific population or phenomenon and can give valuable insights for researchers and practitioners.

The researcher used quantitative surveys to collect data on customer service orientation, ethical behavior, and quality management practices from the resort managers or employees. The survey includes questions that measure different aspects of customer service orientation, ethical behavior, and quality management practices, such as customer feedback, the implementation of moral guidelines, and the implementation of quality management systems. The collected data was analyzed using descriptive statistics to summarize the data and identify patterns and trends. The researcher used inferential statistics to test the hypothesis that customer service orientation and ethical behavior significantly influence quality management practices among the resorts in the Central Luzon Region.

Participants of the Study - Purposive sampling was used to select the resorts. Only those resort hotels accredited by the Department of Tourism (DOT) in the provinces of Central Luzon (Region III) - Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, and Zambales were considered, and only those resorts with more than 30-room capacity and with at least 20 regular employees were included in the study. Resort hotels operating for at least three years and with a full-service lodging facility in areas popular for relaxation or recreation, such as beaches, seashores, scenic or historic areas, ski parks, and spas, with the inclusion of entertainment and recreational activities as part of amenities, were included. Based on DOT accreditation standards, eligible establishments demonstrated consistent compliance with safety, quality, and sustainability benchmarks, contributing to the competitiveness of the Philippine tourism industry (Capistrano et. al.,2021). As explained by Almubark (2019), the DOT accreditation certifies that a tourism enterprise adheres to national standards regarding service excellence, environmental sustainability, and customer safety, assuring guests of a reliable and high-quality experience.

The research advisor, seven resort operation/general managers in Olongapo City (Columban College Hotel and Resort and Oceanview Beach Resort) and Subic Bay Freeport Zone (The Lighthouse Marina Resort, Subic Park Hotel, Best Western Hotel, Segara Villas Subic Bay, and Mansion Garden Hotel), which were not among the resorts that the study's intended target resorts, validated the revised instrument. A professor of English also reviewed it, and the grammar and sentence structure were validated with the Clarity: reliability test and the respondent. The survey instrument underwent content and face validation by a research advisor, seven resort operations/general managers from Olongapo City and Subic Bay Freeport Zone, and an English professor, ensuring clarity, grammatical accuracy, and reliability.

The researcher gathered 328 samples based on the recommendation of the Raosoft sample size calculator, having a 95% confidence level and 5% margin of error. Furthermore, using stratified random sampling, the researcher ensured an equal distribution based on the percentage computation of the total population. Resorts that have been in operation for at least three years and offer full-service lodging in popular locations for relaxation or recreation, such as beaches, seashores, beautiful or historic sites, ski resorts, and spas, were included. Based on these criteria, four resorts from Aurora, nine from Bataan, four from Bulacan, one from Nueva Ecija, five from Pampanga, and nine from Zambales were featured. None from Tarlac met the requirements to be a target resort for the study. Of the 2,208 people who worked at the 32 resorts in Central Luzon, the study's participants were 333 regular employees. The figure was calculated using Raosoft Calculator with a 5% margin of error. To obtain the proper sample proportion per resort, stratified random sampling of participants was considered.

Data Collection Instrument - The instrument used in the study is an adapted survey questionnaire checklist consisting of four (4) parts. Part I elicited information about the participants' demographic profiles, including their age, gender, civil status, highest educational degree, position or work assignment, and number of years working in the resort. Part II was a checklist for assessing the customer service orientation of the hotel resort employees along the dimensions of employee characteristics or attributes, organizational climate culture or organizational support, leader actions, business strategy or environmental attributes, and marketing strategy. This is based on Teng et al. (2009) study, "Service Orientation: Antecedents, Outcomes, and Implications for Hospitality Research and Practice." Part III assessed the ethical behavior of hotel resort employees along the dimensions of moral leadership, rules and policies, employee independence, the law and professional standards, and ethical behavior. This is adapted from the study of Lu et al. (2014) entitled "The Effects of Ethical Leadership and Ethical Climate on Employee Ethical Behavior in the International Port Context." Part IV assessed the TQM practices of the resort employees in terms of customer focus, supplier quality management, continuous improvement, leadership, employee fulfillment, training and development, and process management. This was based on the research of Aldakhil et al. (2017) entitled "The Structural Relationship between TQM, Employee Satisfaction and Hotel

Performance.

At least three experts in the field of study, including a research expert, a hotel manager, and an academician, validated the questionnaire's content. Thirty hotel employees from Subic Bay Freeport Hotels and Zambales, which are not part of the target resorts, also performed pilot testing and content validation on the instrument. Considering the Pearson product-moment correlation using SPSS, the significant value presented in the table, it can be concluded that all items were validly denoting the r value of 0.05. The result of reliability statistics showed that the computed Cronbach's alpha value for Customer Service Orientation (0.937), Ethical Behavior (0.980), and TQM Practices (0.977) signifies that the instrument has strong or excellent internal consistency in the rule of thumb. Thus, this set of questionnaires is considered valid and reliable for use. Cronbach's alpha value are as follows: Customer Service Orientation = 0.937 Excellent, Ethical Behavior = 0.980 Excellent, and TQM Practices = 0.977 Excellent. A 5-point Likert scale was used to answer the questions. The scale ranges from 1 to 5, with five being the highest and one being the lowest. The responses were Strongly Agree, 4 Agree, 3 Moderately Agree, 2 Disagree, and 1 Strongly Disagree.

Data Gathering Procedure - The researcher initiated the data gathering process by obtaining formal permission from the Office of the Graduate School Dean and the Program Dean to conduct the study. An endorsement letter addressed to the Regional Director of the Department of Tourism (DOT) through the Provincial Director was issued to support access to the participating resorts. Correspondence was also sent to resort operation managers, seeking consent to collect employee data. The researcher personally visited and contacted the resort administrators to explain the study's objectives and ensure compliance with ethical standards, including confidentiality, voluntary participation, and data protection. The data were collected using two main instruments: printed survey questionnaires and Google Forms distributed among the resort employees. To strengthen the findings, the researcher employed data triangulation by conducting random, unstructured interviews, both face-to-face and online, as well as field observations during resort visits.

The responses from employees highlighted several key insights. For instance, many employees with longer tenure expressed a deeper understanding of the resort's quality management practices, customer service standards, and ethical protocols. These employees emphasized that their familiarity with organizational systems and recurring guest needs significantly influenced their ability to deliver consistent service quality. One employee from a DOT-accredited resort in Zambales noted, "Being here for more than five years, I've learned how to anticipate what guests need and follow resort standards more confidently." This reflects how the length of service contributes to improved performance, sharper observation of lapses in service, and more efficient implementation of resort policies, corroborating the claims of Kusluvan et al. (2018) that employee experience correlates with service excellence. Similarly, employees in managerial or supervisory roles often discussed how their long-term involvement in resort operations helped them ensure ethical compliance and proper documentation for DOT accreditation.

The combination of structured survey responses and qualitative feedback from interviews reinforced the validity of the findings, illustrating that length of service not only affects performance and familiarity but also strengthens the commitment to uphold the customer service orientation and ethical values embedded in DOT standards (Nam et. al.,2021; Almubark, 2019). This approach allowed the researcher to capture a well-rounded view of the employee experiences and their alignment with quality management practices.

Data Analysis - Data were analyzed using the following statistical measures: The Weighted Mean was used to measure the employees' average responses in all the instrument items. It was used to see the general or average description of each indicator being assessed. Pearson r Product Moment Correlation Coefficient was used to test the significant correlation between customer service orientation, ethical behavior, and TQM practices at a 5% alpha.

Ethical Consideration - Ethics in research was discussed with the selected participants and in the Disclaimer portion of the Google Form. They were assured that their data and that of the company were protected and held confidential. The researcher ensured that the provisions of the Data Privacy Law were followed accordingly.

Participants were also assured that all data gathered would be used only for research and academic purposes. No names were mentioned in the report to observe the confidentiality of the survey responses and the interviews. The identity of the respondents was not revealed, nor was the name of the resort hotels. No personal opinions were included, and only information and evidence based on the data gathered through the survey checklist, interviews, and observation were considered in the data analysis. The research participants were not subjected to harm in any way, fear, or threat. The study considered high respect for the participants and the integrity of the research; thus, it was prioritized, and full consent was obtained from the participants before the study. The researcher considered asking permission from the management about the identified hotel before conducting the survey.

3. Results and discussion

Table 1

Summary Table for the Respondent's Agreement On Customer Service Orientation

In terms of	Mean	Interpretation	Rank
Employee Characteristics	4.32	Agree	2
Organizational Culture	4.34	Agree	1
Business Strategy	4.30	Agree	3
Overall Customer Service Orientation	4.32	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

The results in Table 1 are the summary table for the respondents' agreement on Customer Service Orientation, with a mean of 4.32. Customer service orientation refers to behaviors, attitudes, and practices prioritizing meeting customers' needs and expectations. It focuses on providing quality service and building positive relationships with customers.

The summary table of respondents' agreement on customer service orientation shows that organizational culture is at the highest rank, with a mean of 4.34 followed by employee characteristics, with a mean of 4.32. The highest ranking of organizational culture may suggest that shared values, leadership relations, and internal workplace norms are the most salient contributors to customer service orientation in resorts. This implies that service behavior may be more strongly shaped by internal culture than by formal strategies or individual traits alone. The data suggests that cultural alignment functions as the dominant structural influence on service orientation. The ranking of employee characteristics as second-highest may indicate that personal attributes and interpersonal behaviors are important, but operate within the broader influence of organizational culture. This suggests that individual service behavior is likely reinforced by institutional norms rather than driven purely by personal traits.

The summary table shows that the respondent's agreement on customer service orientation has a mean of 4.30 and is ranked lowest as a business strategy. Although still interpreted as Agree, business strategy ranked lowest, indicating a comparatively weaker strategic visibility in customer service orientation. This suggests that service orientation may be more culturally and behaviorally embedded than formally structured through strategic systems and planning frameworks. The data implies that customer service orientation is experienced more as a cultural practice than as a strategic mechanism. The small mean differences across dimensions indicate high consistency in perceptions, suggesting integrated rather than fragmented service orientation systems. The rankings reflect relative emphasis rather than operational deficiencies.

The low rank of customer service orientation as a business strategy suggests that it may not prioritize the importance of providing exceptional customer service as a critical component of its business strategy. The resort may need to invest more resources into training and developing its employees to provide excellent customer service. The study of Song, et al. (2018) suggests that resort management can take several steps to improve its customer service orientation as a business strategy. This can include conducting market research and customer surveys to better understand guests' needs and expectations.

Table 2
Summary Table for the Respondent's Agreement on Ethical Behavior

In terms of	Mean	Interpretation	Rank
Ethical Leadership	4.27	Agree	3.5
Rules and Policies	4.26	Agree	5
Employee Independence	4.27	Agree	3.5
Law and Professional Standards	4.29	Agree	2
Ethical Behavior	4.39	Agree	1
Overall Ethical Behavior	4.31	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Results in Table 2 indicate that the respondents to this study generally agree with the listed statements regarding ethical behavior, with a composite mean of 4.31. The highest rank is the employee's agreement on ethical Behavior, with a mean of 4.39. It is followed by Law and Professional Standards, with a mean of 4.29, and ethical leadership and employee independence, with a mean of 3.5. The highest ranking of general ethical behavior may suggest that everyday ethical conduct (honesty, accountability, responsibility, and integrity in routine work behavior) is the most salient ethical dimension in resort operations. This implies that ethics is most strongly perceived at the behavioral level, rather than at the policy or structural level. The data suggests that ethical behavior is primarily experienced through daily work practices. The strong ranking of law and professional standards indicates that legal compliance and professional norms are also recognized components of ethical conduct. This suggests that formal regulatory ethics complement everyday ethical behavior, forming a layered ethical structure. The moderate score for ethical leadership and employee independence may indicate that leadership-driven ethics and autonomy-based ethics are present but less salient than routine behavioral ethics and professional compliance systems. This implies a structure where ethics is more operational than normative or autonomy-driven. The highest rank in the resort employees' agreement on ethical behavior highlights the importance of honesty, integrity, and accountability in the workplace.

The lowest in the Summary Table for the Respondent's Agreement on Ethical Behavior is the employees' agreement regarding rules and policies, with a mean of 4.26. Although still interpreted as Agree, rules and policies ranked lowest, suggesting a comparatively weaker visibility of formal policy structures in shaping ethical perceptions. This implies that employees may experience ethics more through practice and behavior than through formal policy instruments. The data suggests ethics is culturally embedded rather than policy-dominant. It suggests that employees may need to fully understand or agree with the organization's rules and policies regarding ethical behavior. This finding may be concerning because rules and policies serve as a framework for ethical conduct and help guide employees' actions in complex moral situations. While the lowest rank in the Summary Table for the Resort Employee Agreement on Ethical Behavior highlights a potential area for improvement, it also presents an opportunity for the organization to strengthen its ethical culture. By reviewing and revising its rules and policies, providing regular training and communication, and establishing a mechanism for employee feedback, the organization can foster a culture of ethical behavior and reinforce its commitment to integrity and accountability. The ethical behavior exhibited by hotel management in the Philippines is profoundly influenced by ethical leadership and the prevailing ethical climate. These factors directly impact employee behavior and the organization's overall outcomes. Empirical studies suggest that cultivating an ethical environment is essential for alleviating unethical practices and promoting service-oriented behaviors.

Table 3
Summary Table for the Respondent's Agreement on TQM Practices

In terms of	Mean	Interpretation	Rank
Customer Focus	4.30	Agree	4
Supplier Quality Management	4.31	Agree	2
Continuous Improvement	4.29	Agree	5.5
Leadership	4.31	Agree	2
Employee Fulfillment	4.29	Agree	5.5
Training and Development	4.28	Agree	7
Process Management	4.31	Agree	2
Overall TQM Practices	4.30	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Results in Table 3 indicate that the respondents to this study generally agree with the listed statements regarding TQM practices, with a composite mean of 4.30. The summary table showed the highest agreement among employees on TQM practices: supplier quality management, leadership, and process management, with a mean of 4.31, followed by customer focus, with a mean of 4.30. The high ranking of supplier quality management may reflect the visibility of procurement standards, quality criteria, and supplier relationships, which are institutionally structured and operationally consistent. The strong ranking of leadership may indicate the visibility of managerial direction, goal-setting, and planning practices, which employees directly experience through policies, communication, and operational guidance. The high ranking of process management may reflect the presence of standardized procedures and operational systems, which are embedded in daily work routines and therefore highly perceptible to employees. Together, these results suggest that structural and system-based TQM components are more visible and institutionalized than developmental components.

Employees place a high value on these areas and see them as essential to achieving quality goals and encouraging continuous improvement, as evidenced by leadership, process management, and supplier quality management, which received the highest scores in the summary table for employees' agreement on TQM practices. To stay ahead of the competition, they regularly examine and improve their processes, evaluate supplier performance, and make leadership development investments. They may conduct regular audits, inspections, and performance evaluations to spot problems early and take appropriate action. Open lines of communication between suppliers, executives, and staff members are maintained by resort management, helping to foster a sense of mutual trust, enhance teamwork, and guarantee that everyone is on the same page. To assist employees in developing and moving forward, they involve them in decision-making processes, offer regular feedback and recognition, and invest in their training and development. Management promotes attention and alignment by ensuring everyone works toward the same goals. These are just a few reasons why process management, leadership, and supplier quality management received the highest marks in the poll.

The summary table showed the lowest employee agreement on TQM practices: Continuous improvement and employee fulfillment, with a mean of 4.29, followed by training and development, with a mean of 4.28. However, these areas also present the most significant potential for improvement, offering a source of motivation and inspiration for resort management to enhance their TQM practices. The comparatively lower ranking of continuous improvement and employee fulfillment may reflect the lower visibility of participatory and developmental systems, such as employee voice mechanisms, empowerment structures, and long-term developmental processes. These elements are often less tangible than formal systems and procedures. The lower ranking of training and development may indicate that while training resources exist, formal quality-principle training and structured development systems are less visible than operational and procedural practices.

There are a variety of ways that resort employee training and development might go wrong, which can harm the resort's performance in terms of employee morale, customer service, and profitability. However, there are potential solutions to these issues. Investing in training and development may not be possible for resort management due to a lack of resources, including time and money. Because of this, workers may not have access to training opportunities, which could hinder their ability to advance professionally. The culture of some resorts might need to place a higher priority on employee development. They might give more importance to other factors, including production or profitability. This may lead to a lack of focus on training and development and fewer opportunities for staff members to advance their careers. Training programs may need to be more successful in addressing employees' needs. For instance, it's possible that the training won't apply to the employees' duties or won't give them enough support to put what they learned to use in their jobs. Employees may need more training opportunities thanks to the resort management. This may be particularly true for scattered or remote teams, where providing in-person training may be more difficult. Employee participation in training and development may be low, and they may need to see the benefit of devoting time and energy to personal growth. Due to this, training and development activities may have poor participation rates and little success. These are just a few potential explanations for why training and development received the lowest rating in the study. To completely comprehend the survey's findings, it's crucial to remember that there might be additional factors at work. Some common reasons training and development initiatives fail in the resort industry include the need for a well-defined training plan.

In line with Yang et al. (2018) Employees may not gain the skills and information required to carry out their duties effectively if training and development programs are poorly designed, structured, and carried out in 2018, which can result in poor performance. This can cause uncertainty, irritation, and a loss of confidence among employees. Resources for training could be insufficient. The quality of training may improve if the resort supplies more resources, including instructors, instructional materials, and facilities. Additional research by Li et al. (2018) indicates that a lack of resources may result in subpar training, a lack of conceptual comprehension, and a failure to transfer abilities effectively. According to the research of Kang et al. (2018), employees can only grasp how their training pertains to the broader picture if it is synchronized with organizational goals and objectives. This could result in a lack of drive, less interest, and subpar work. Furthermore, in Yitmen's (2018) study, practical training and development efforts must be regularly followed up on to monitor success and pinpoint growth opportunities. Employees may miss opportunities to advance and develop their talents if the resort does not offer this follow-up and feedback.

Table 4 presents the correlation between customer service orientation and the ethical behavior of participants. It reveals that customer orientation in terms of employee characteristics/attributes has highly significant strong correlation with ethical behavior in terms of ethical leadership; it has highly significant moderate correlations with rules and policies, employees independence, and the law and professional standards. It has a highly significant weak correlation with ethical behavior. The null hypothesis is rejected at 5% alpha. All the correlation values are highly significant.

The results indicate a highly significant correlation between customer service orientation and ethical behavior in terms of ethical leadership. Employees with strong customer service orientation are more likely to demonstrate ethical leadership behaviors. Additionally, the study found highly significant moderate correlations between customer service orientation and ethical behavior regarding rules and policies, employees' independence, and adherence to the law and professional standards. These findings suggest that employees with a greater customer service orientation are more likely to follow rules and policies, exercise independence in decision-making, and comply with legal and professional standards. Furthermore, the study revealed a highly significant weak correlation between customer service orientation and ethical behavior. The findings from this study provide robust evidence that a higher level of customer service orientation among employees is associated with more ethical behavior, particularly in terms of ethical leadership, adherence to rules and policies, independence, and compliance with the law and professional standards.

Table 4
Relationship of Customer Service Orientation to Ethical Behavior

Correlation between Customer Service Orientation and Ethical Behavior		Employee Characteristics/ Attributes	Organizational Climate Culture	Business Strategy
Ethical Leadership	Pearson Correlation	.615**	.635**	.726**
	Sig. (2-tailed)	.000	.000	.000
		Highly Significant	Highly Significant	Highly Significant
Rules and Policies	Pearson Correlation	.549**	.538**	.666**
	Sig. (2-tailed)	.000	.000	.000
		Highly Significant	Highly Significant	Highly Significant
Employees Independence	Pearson Correlation	.503**	.567**	.642**
	Sig. (2-tailed)	.000	.000	.000
		Highly Significant	Highly Significant	Highly Significant
The Law and Professional Standards	Pearson Correlation	.495**	.465**	.596**
	Sig. (2-tailed)	.000	.000	.000
		Highly Significant	Highly Significant	Highly Significant

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

These results suggest that employees who demonstrate strong service-oriented characteristics are more likely to operate within ethical leadership structures, comply with organizational rules, exercise responsible autonomy, and adhere to legal and professional standards. This pattern aligns with recent studies showing that service orientation is closely linked to ethical awareness, value-driven behavior, and integrity-based performance (Bedi et al., 2021; Newman et al., 2020; Zoghbi-Manrique-de-Lara et al., 2022). It can also be gleaned from the table that customer orientation in terms of organizational climate culture has a highly significant correlation with ethical behavior in terms of ethical leadership. It has highly significant moderate correlations with rules and policies, employees independence, the law and professional standards , and ethical behavior. The null hypothesis is also rejected at 5% alpha. All the correlation values are highly significant.

The study found a highly significant correlation between customer orientation within organizational climate culture and ethical leadership, suggesting that organizations with a strong focus on customers are more likely to demonstrate ethical leadership behaviors. The results also show moderately significant correlations between customer orientation and ethical behavior in terms of adherence to rules and policies, employees' independence, and compliance with laws and professional standards, as well as a strong relationship with overall ethical behavior. These findings indicate that a higher level of customer orientation in an organization's climate and culture is associated with stronger ethical practices, including ethical leadership, responsible decision-making, compliance with standards, and improved overall ethical behavior within the organization.

These results indicate that a customer-oriented organizational climate is systematically associated with stronger ethical governance structures and ethical conduct. This supports recent organizational ethics research showing that ethical leadership and ethical behavior are embedded in organizational culture rather than isolated individual actions (Newman et al., 2020; Fehr et al., 2020; Wang et al., 2023). A customer-centered climate fosters shared norms of responsibility, accountability, and integrity, which reinforce ethical standards across organizational levels. Furthermore, the customer orientation in terms of business strategy has a highly significant strong correlation with ethical behavior in terms of ethical leadership, rules and policies, and employees independence. It has a highly significant moderate correlation with the law and professional standards and ethical behavior. The null hypothesis is rejected at 5% alpha. All the correlation values are highly significant.

The study found a highly significant correlation between customer orientation as a business strategy and ethical behavior, particularly ethical leadership. This suggests that organizations that strongly prioritize customer needs are more likely to demonstrate transparency, fairness, and accountability in leadership, as leaders consider the interests of customers, employees, and other stakeholders (Freire et al., 2020). The results also show moderately significant correlations between customer orientation and adherence to rules and policies, employees' independence in decision-making, and compliance with laws and professional standards. Additionally, customer orientation is strongly associated with overall ethical behavior within the organization. Overall, the findings indicate that integrating customer orientation into business strategy positively supports ethical leadership and promotes responsible, compliant, and principled behavior across the organization. This pattern indicates that when customer orientation is embedded at the strategic level, ethical behavior becomes structurally integrated into organizational decision-making. This supports contemporary management research showing that strategic customer orientation promotes ethical governance, stakeholder accountability, and value-based leadership (Freire et. al.,2020; Bamel et. al.,2021; Wang et. al.,2022). Organizations that strategically prioritize customer orientation tend to institutionalize transparency, fairness, and responsibility as operational norms, reinforcing ethical leadership and compliance systems.

Overall, the findings demonstrate a systematic, positive, and statistically robust relationship between customer service orientation and ethical behavior across individual, cultural, and strategic levels. The strength of correlations increases as customer orientation moves from individual attributes → organizational culture → business strategy, indicating that ethical behavior becomes stronger when customer orientation is institutionally embedded rather than individually practiced. This pattern suggests that ethical behavior is not merely a personal trait but a structurally reinforced organizational outcome, shaped by leadership systems, cultural norms, and strategic orientations. The results are consistent with contemporary ethical governance models, which emphasize that ethics emerges from integrated organizational systems rather than isolated moral actions (Newman et. al.,2020; Bedi et. al.,2021; Zoghbi-Manrique-de-Lara et. al.,2022). The results provide strong empirical evidence that higher customer service orientation is positively and significantly associated with stronger ethical behavior across all ethical dimensions, particularly ethical leadership, rule compliance, responsible autonomy, and adherence to legal and professional standards. Customer orientation functions not only as a service framework but also as a structural driver of ethical governance within organizations.

Table 5 shows the Pearson r-correlation results between ethical behavior and TQM practices. The ethical behavior in terms of ethical leadership has highly significant strong correlation with TQM practices in terms of customer focus, continuous improvement, leadership, employee fulfillment, training and development, and process management; and it has a highly significant moderate correlation with supplier quality management. All the r-values are significant at 5% alpha; thus, the null hypothesis is rejected. The results suggest that ethical behavior, specifically ethical leadership, strongly and significantly correlates with TQM practices such as customer focus, continuous improvement, leadership, employee fulfillment, training and development, and process management. There is a moderately strong correlation between ethical leadership and supplier quality management.

Ethical leadership shows a strong positive relationship with several Total Quality Management (TQM) practices. Organizations with ethical leaders tend to emphasize customer focus, as these leaders prioritize customer needs and satisfaction, aligning with TQM's goal of meeting and exceeding customer expectations. Ethical leadership is also strongly linked to continuous improvement, as ethical leaders encourage innovation, problem-solving, and ongoing learning to improve processes, products, and services. Ethical leaders also contribute to effective leadership within TQM by serving as role models who motivate employees toward shared goals of quality improvement and organizational success. In addition, they promote employee fulfillment by fostering a supportive and fair work environment, which increases engagement and supports successful TQM implementation. Furthermore, ethical leadership is positively associated with training and development and process management, as ethical leaders invest in employee skills and promote transparency, accountability, and structured approaches to improving organizational processes. While the relationship with supplier quality management is slightly more moderate, ethical leaders still encourage fair and responsible supplier relationships. Overall, these correlations show that ethical leadership plays a significant role in supporting the successful implementation of TQM practices across organizations.

This pattern indicates that higher levels of ethical leadership tend to co-occur with stronger people-centered and system-centered quality practices. This finding is consistent with studies showing that ethical leadership is strongly associated with employee engagement, organizational learning, quality culture, and performance systems that support continuous improvement and service excellence (Schwepker et. al.,2021; Guo et al., 2022; Hoang et al., 2023). Ethical behavior in terms of rules and policies shows a highly significant strong correlation with TQM practices such as continuous improvement, leadership, employee fulfillment, training and development, and process management, and a highly significant moderate correlation with customer focus and supplier quality management. Since all r-values are significant at the 5% alpha level, the null hypothesis is rejected.

The strong correlation with continuous improvement indicates that organizations that prioritize ethical behavior are more likely to promote innovation, adaptability, and ongoing efforts to improve processes, products, and services. Ethical values encourage organizations to strive for better outcomes and maintain high standards of quality and efficiency. The relationship with leadership suggests that ethical organizations tend to have leaders who demonstrate integrity, transparency, and accountability. Such leaders inspire trust, guide employees effectively, and promote a culture that supports both ethical conduct and organizational success. Ethical behavior also strongly relates to employee fulfillment, as organizations that treat employees with fairness, respect, and dignity create a supportive work environment that increases engagement, satisfaction, and motivation.

Similarly, ethical organizations tend to prioritize training and development, recognizing the importance of investing in employee growth and continuous learning to improve skills, knowledge, and organizational performance.

Table 5
Correlation between Ethical Behavior and TQM Practices

		Ethical Leadership	Rules and Policies	Employees Independence	The Law and Professional Standards	Ethical Behavior
Customer Focus	Pearson Correlation	.625**	.515**	.545**	.511**	.442**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
		HS	HS	HS	HS	HS
Supplier Quality Management	Pearson Correlation	.477**	.457**	.453**	.477**	.393**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
		HS	HS	HS	HS	HS
Continuous Improvement	Pearson Correlation	.688**	.626**	.595**	.589**	.550**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
		HS	HS	HS	HS	HS
Leadership	Pearson Correlation	.700**	.627**	.624**	.590**	.546**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
		HS	HS	HS	HS	HS
Employee Fulfillment	Pearson Correlation	.739**	.654**	.639**	.563**	.595**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
		HS	HS	HS	HS	HS
Training and Development	Pearson Correlation	.742**	.662**	.660**	.588**	.650**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
		HS	HS	HS	HS	HS
Process Management	Pearson Correlation	.718**	.633**	.644**	.588**	.590**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
		HS	HS	HS	HS	HS

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

The strong correlation with process management indicates that ethical organizations are more likely to implement systematic, transparent, and efficient processes. Ethical values promote accountability, consistency, and continuous evaluation of processes to achieve better organizational outcomes.This suggests that rule-based ethical environments are closely associated with internal quality control mechanisms, process discipline, and structured improvement systems. This aligns with contemporary TQM literature emphasizing that ethical governance, standardization, and procedural consistency support quality stability and organizational reliability (ASQ, 2024; Loedphacharakamon, 2025). The ethical behavior in terms of employees independence has highly significant strong correlation with TQM practices in terms of leadership, employee fulfillment, training and development, and process management; and it has a highly significant moderate correlation with customer focus, supplier quality management, and continuous improvement. All the r-values are significant at 5% alpha; thus, the null hypothesis is rejected.

There is a strong positive correlation between ethical behavior regarding employees' independence and leadership practices. This suggests that organizations that value employees' independence are likelier to have strong leadership qualities. Ethical behavior regarding employees' independence correlates highly significantly with employee fulfillment. This means that organizations prioritizing employees' independence are more likely to have satisfied and fulfilled employees. There is a highly significant strong correlation between ethical behavior regarding employees' independence and training and development practices. This indicates that organizations valuing employees' independence are more likely to invest in their training and development. Ethical behavior regarding employees' independence correlates highly significantly with process management. This suggests that organizations prioritizing employees' independence are more likely to have effective and efficient processes. Additionally, ethical behavior regarding employees' independence has a highly significant moderate correlation with customer focus. This means that organizations valuing employees' independence are more likely to prioritize customer satisfaction and focus on meeting customer needs.

This pattern indicates that ethical autonomy and responsible independence among employees are associated with stronger organizational learning systems and quality execution structures. Recent research supports that ethical climates fostering autonomy and empowerment are positively associated with employee outcomes and quality-oriented performance behaviors (Guo et al., 2022; Sookdawoor, 2022). Furthermore, there is a highly significant moderate correlation between ethical behavior regarding employees' independence and supplier quality management. This indicates that organizations valuing employees' independence are more likely to have effective supplier quality management practices. Lastly, ethical behavior regarding employees' independence has a highly significant moderate correlation with continuous improvement. This suggests that organizations prioritizing employees' independence are more likely to engage in continuous improvement efforts. All the mentioned correlation coefficients are statistically significant at the 5% alpha level, meaning that the observed relationships are unlikely to have occurred by chance. Therefore, the null hypothesis, which assumes no relationship between ethical behavior regarding employees' independence and the mentioned TQM practices, is rejected.

The ethical behavior in terms of the law and professional standards has highly significant moderate correlation with TQM practices in terms of customer focus, supplier quality management, continuous improvement, leadership, employee fulfillment, training and development, and process management. All the r-values are significant at 5% alpha; thus, the null hypothesis is rejected. These results suggest that compliance-oriented ethics are consistently associated with structured quality systems and governance mechanisms. This supports models of ethical governance that link regulatory compliance, accountability, and professional standards with quality management infrastructures (ASQ, 2024; Ma, 2025).

There is a highly significant moderate correlation between ethical behavior regarding the law, professional standards, and customer focus. This suggests that organizations that prioritize adherence to legal and professional standards are more likely to emphasize customer satisfaction and focus on meeting customer needs. Ethical behavior regarding the law and professional standards significantly correlates moderately with supplier quality management. This means that organizations prioritizing ethical practices are more likely to have effective supplier quality management practices. There is a significant moderate correlation between ethical behavior regarding the law and professional standards and continuous improvement. This indicates that organizations prioritizing adherence to legal and professional standards are more likely to engage in continuous improvement efforts. Ethical behavior regarding the law and professional standards significantly correlates moderately with leadership practices. This suggests that organizations prioritizing ethical practices are likelier to exhibit strong leadership qualities. There is a significant moderate correlation between ethical behavior regarding the law and professional standards and employee fulfillment. Organizations prioritizing adherence to legal and professional standards are likelier to have satisfied and fulfilled employees. Ethical behavior regarding the law and professional standards significantly correlates moderately with training and development practices. This indicates that organizations that prioritize ethical practices are more likely to invest in the training and development of their employees.

There is a significant moderate correlation between ethical behavior regarding the law and professional standards and process management. This suggests that organizations prioritizing adherence to legal and professional standards are more likely to have effective and efficient processes. All the mentioned correlation coefficients are statistically significant at the 5% alpha level, meaning that the observed relationships are unlikely to have occurred by chance. Therefore, the null hypothesis is rejected, which assumes no relationship between ethical behavior regarding the law and professional standards and the mentioned TQM practices.

It indicates that ethical behavior regarding the law and professional standards significantly correlates with various aspects of TQM practices. Organizations prioritizing adherence to legal and professional standards are more likely to focus on customer satisfaction, prioritize supplier quality management, engage in continuous improvement efforts, exhibit strong leadership qualities, have satisfied employees, invest in training and development, and maintain effective process management. The ethical behavior has highly significant strong correlation with TQM practices in terms of training and development; it has a highly significant moderate correlation with TQM practices in terms of customer focus, continuous improvement, leadership, employee fulfillment and process management; it has highly significant weak correlation with supplier quality management). The null hypothesis is also rejected at 5% alpha.

Finally, overall ethical behavior showed its strongest association with training and development, followed by employee fulfillment, process management, continuous improvement, leadership, and customer focus, while its relationship with supplier quality management was weaker but still significant. This indicates that ethical behavior is more strongly linked to internal organizational systems (people development, leadership, processes, learning) than to external relational systems (supplier management). Similar patterns have been observed in recent hospitality and service research, where ethics is more directly embedded in internal governance and workforce systems than in supply-chain structures (Schwepker et. al.,2021; Hoang et al., 2023; Loedphacharakamon, 2025).

Ethical behavior shows a highly significant strong correlation with training and development, indicating that organizations prioritizing ethics are more likely to invest in employee learning and growth. This strengthens employee performance, ethical competence, engagement, and the development of future ethical leaders. Ethical behavior also has a highly significant moderate correlation with customer focus, suggesting that ethical organizations are more likely to prioritize customer satisfaction, build trust, and maintain a positive reputation through responsible and customer-centered practices. A significant correlation with continuous improvement indicates that organizations that value ethical behavior are more likely to promote a culture of learning, innovation, and commitment to excellence, supporting sustainable growth and organizational development.

Ethical behavior further shows a highly significant moderate correlation with leadership practices, meaning ethical organizations are more likely to demonstrate strong leadership characterized by integrity, transparency, and accountability. Ethical leadership fosters trust, motivation, and a positive organizational culture that enhances productivity and stakeholder relationships. There is also a significant correlation with employee fulfillment, suggesting that ethical workplaces create environments where employees feel respected, valued, and motivated, leading to greater engagement, satisfaction, and retention. Additionally, ethical behavior has a moderate correlation with process management, indicating that ethical organizations are more likely to implement transparent, accountable, and efficient processes that support effective operations.

Finally, ethical behavior has a highly significant but weak correlation with supplier quality management, suggesting that while ethical practices contribute to better supplier relationships and quality standards, other operational and supply chain factors also play important roles. Overall, the results indicate that ethical behavior significantly correlates with several aspects of TQM practices. Organizations that prioritize ethical behavior are more likely to invest in training and development, emphasize customer satisfaction, pursue continuous improvement, demonstrate strong leadership, support employee fulfillment, and maintain effective process management. Although the relationship with supplier quality management is weaker, it still suggests a meaningful association.

Findings provide strong empirical evidence that ethical behavior is aligned with TQM implementation. The correlations tend to be stronger in internal organizational systems—such as training, leadership, employee fulfillment, and process management—than in external systems like supplier quality management. This suggests that ethics is deeply embedded in organizational culture, leadership structures, and internal quality systems, supporting contemporary views that ethical behavior functions as a structural driver of quality governance rather than merely an individual moral trait (Guo et al., 2022; Hoang et al., 2023; ASQ, 2024).

Table 6 presents the correlation between customer service orientation and TQM practices. It reveals that customer orientation in terms of employee characteristics/attributes has highly significant moderate correlation with TQM practices in terms of customer focus, continuous improvement, leadership, employee fulfillment, training and development, and process management. It has a highly significant weak correlation with supplier quality management. All the computed values are highly significant; thus, the null hypothesis is rejected.

Customer orientation regarding employee characteristics/attributes has a highly significant moderate correlation with customer focus. This suggests that organizations that emphasize customer orientation in their employees are more likely to prioritize customer satisfaction and focus on meeting customer needs. Resorts may invest in developing and nurturing customer orientation in their employees. By doing so, they can foster a customer-centric culture, enhance customer satisfaction, gain a competitive advantage, and improve customer retention, ultimately leading to long-term business growth and success.

Table 6

Correlation between Customer Service Orientation and TQM Practices

		Employee Characteristics/ Attributes	Organizational Climate Culture	Business Strategy
Customer Focus	Pearson Correlation	.543**	.538**	.560**
	Sig. (2-tailed)	.000	.000	.000
		HS	HS	HS
Supplier Quality Management	Pearson Correlation	.343**	.439**	.481**
	Sig. (2-tailed)	.000	.000	.000
		HS	HS	HS
Continuous Improvement	Pearson Correlation	.548**	.554**	.590**
	Sig. (2-tailed)	.000	.000	.000
		HS	HS	HS
Leadership	Pearson Correlation	.564**	.567**	.586**
	Sig. (2-tailed)	.000	.000	.000
		HS	HS	HS
Employee Fulfillment	Pearson Correlation	.494**	.556**	.603**
	Sig. (2-tailed)	.000	.000	.000
		HS	HS	HS
Training and Development	Pearson Correlation	.515**	.524**	.600**
	Sig. (2-tailed)	.000	.000	.000
		HS	HS	HS
Process Management	Pearson Correlation	.520**	.530**	.570**
	Sig. (2-tailed)	.000	.000	.000
		HS	HS	HS

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

Customer orientation in terms of employee characteristics/attributes has a highly significant moderate correlation with continuous improvement. This indicates that organizations that promote customer orientation in their employees are more likely to engage in continuous improvement efforts. Resorts may prioritize customer orientation among their employees to drive continuous improvement efforts. By fostering a culture that values customer needs and encourages employees to contribute to improvement initiatives, organizations can achieve customer-driven innovation and proactive problem-solving, become a learning organization, gain a competitive advantage, and foster higher employee engagement and satisfaction levels.

Customer orientation regarding employee characteristics/attributes significantly correlates moderately with leadership practices. This suggests that organizations fostering employee customer orientation are more likely to exhibit strong leadership qualities. Resorts may foster customer orientation in their employees to develop strong leadership practices. Organizations can cultivate leaders who prioritize customer satisfaction by emphasizing customer-centric leadership, effective communication, empowerment, collaboration, organizational alignment, and a positive culture. These leadership practices enhance customer experiences, employee engagement, and overall organizational success.

Customer orientation regarding employee characteristics/attributes has a significant moderate correlation with employee fulfillment. This means that organizations that promote customer orientation in their employees are more likely to have satisfied and fulfilled employees. Resorts that prioritize and encourage customer orientation in their employees are more likely to have satisfied and fulfilled employees. When employees possess customer-oriented characteristics and attributes, such as empathy, effective communication skills, and a focus on meeting customer needs, they are better equipped to deliver excellent customer service. This, in turn, can lead to increased job satisfaction and fulfillment among employees. Customer orientation regarding employee characteristics/attributes significantly correlates moderately with training and development practices. This indicates that organizations that emphasize customer orientation in their employees are more likely to invest in their training and development. Customer orientation regarding employee characteristics/attributes has a highly significant moderate correlation with process management. This suggests that organizations that promote customer orientation in their employees are more likely to have effective and efficient processes in place. Customer orientation regarding employee characteristics/attributes has a highly significant weak correlation with supplier quality management. While the correlation is weaker compared to the other factors, it still suggests some association between customer orientation in employees and supplier quality management practices.

Overall, the results indicate that customer orientation regarding employee characteristics/attributes is significantly correlated with various aspects of TQM practices. Organizations that promote customer orientation in their employees are more likely to focus on customer satisfaction, engage in continuous improvement efforts, exhibit strong leadership qualities, have satisfied employees, invest in training and development, and maintain effective process management. While the correlation with supplier quality management is weaker, it still suggests some association between customer orientation in employees and supplier quality management practices. This pattern indicates that when customer orientation is embedded in employee traits—such as empathy, communication competence, responsiveness, and service values—it tends to co-occur with stronger internal quality systems and people-centered management practices. This aligns with contemporary service management research showing that employee-level service orientation supports quality culture, organizational learning, leadership effectiveness, and continuous improvement structures (Newman et al., 2020; Schwepker et. al.,2021; Wang et al., 2022). The weaker association with supplier quality management suggests that supplier systems are more structurally driven by procurement and supply-chain mechanisms than by frontline service orientation (Loedphacharakamon, 2025).

It also reflected on the table that customer orientation in terms of organizational climate culture has highly significant moderate correlation with TQM practices in terms of customer focus, supplier quality management, continuous improvement, leadership, employee fulfillment, training and development, and process management. All the computed values are also highly significant; thus, the null hypothesis is rejected. Customer orientation in terms of organizational climate culture has a highly significant moderate correlation with customer focus. This suggests that organizations with a customer-oriented organizational climate and culture are more likely to prioritize customer satisfaction and focus on meeting customer needs. Customer orientation in terms of organizational climate culture has a highly significant moderate correlation with supplier quality management. This indicates that organizations with a customer-oriented organizational climate and culture are more likely to have better practices in managing the quality of their suppliers. Customer orientation in terms of organizational climate culture has a highly significant moderate correlation with continuous improvement. This suggests that organizations with a customer-oriented organizational climate and culture are more likely to engage in continuous improvement efforts.

Customer orientation in organizational climate culture has a highly significant moderate correlation with leadership practices. This indicates that organizations with a customer-oriented organizational climate and culture are likelier to exhibit strong leadership qualities. Customer orientation in terms of organizational climate culture has a highly significant moderate correlation with employee fulfillment. This means that organizations with a customer-oriented organizational climate and culture are likelier to have satisfied and fulfilled employees. Customer orientation in organizational climate culture significantly correlates moderately with training and development practices. This suggests that organizations with a customer-oriented organizational climate and culture are more likely to invest in the training and development of their employees.

Customer orientation in terms of organizational climate culture has a highly significant moderate correlation with process management. This indicates that organizations with a customer-oriented organizational climate and culture are likelier to have effective and efficient processes. Customer orientation in organizational climate culture significantly correlates with various aspects of TQM practices. Organizations with a customer-oriented organizational climate and culture are more likely to focus on customer satisfaction, have better supplier quality management practices, engage in continuous improvement efforts, exhibit strong leadership qualities, have satisfied employees, invest in training and development, and maintain effective process management. These findings suggest that a customer-oriented organizational climate is structurally associated with stronger internal quality systems, leadership coherence, workforce development, and improvement cultures. Recent studies emphasize that customer-centered cultures function as institutional enablers of TQM, shaping shared norms, leadership practices, employee engagement, and process discipline (Fehr et al., 2020; Guo et al., 2022; Hoang et al., 2023).

Furthermore, the customer orientation in terms of organizational business strategy has a highly significant strong correlation with TQM practices in terms of employee fulfillment and training and development. It has highly significant moderate correlation with TQM practices in terms of customer focus, supplier quality management, continuous improvement, leadership, and process management. All the computed values are also highly significant; thus, the null hypothesis is rejected. Customer orientation in terms of organizational business strategy has a highly significant moderate correlation with customer focus. This suggests that organizations aligning their business strategy with customer orientation are more likely to prioritize customer satisfaction and meet customer needs. Customer orientation in terms of organizational business strategy has a highly significant moderate correlation with supplier quality management. This indicates that organizations that align their business strategy with customer orientation are more likely to have better practices in managing the quality of their suppliers and to engage in continuous improvement efforts. Customer orientation in terms of organizational business strategy has a highly significant moderate correlation with leadership practices. This indicates that organizations aligning their business strategy with customer orientation are more likely to exhibit strong leadership qualities.

Customer orientation in terms of organizational business strategy has a highly significant correlation with employee fulfillment. This means that organizations that align their business strategy with customer orientation are more likely to have satisfied and fulfilled employees. Customer orientation in organizational business strategy correlates highly significantly with training and development practices. This suggests that organizations that align their business strategy with customer orientation are more likely to invest in the training and development of their employees. Customer orientation in terms of organizational business strategy has a highly significant moderate correlation with process management. This indicates that organizations aligning their business strategy with customer orientation are more likely to have effective and efficient processes. Organizations that align their business strategy with customer orientation are more likely to focus on customer satisfaction, have better supplier quality management practices, engage in continuous improvement efforts, exhibit strong leadership qualities, have satisfied employees, invest in training and development, and maintain effective process management.

This pattern indicates that when customer orientation is embedded at the strategic level, it becomes structurally integrated into quality governance systems. Strategic customer orientation aligns organizational goals, leadership systems, employee development, and process design around customer value creation. This is consistent with recent research showing that customer-oriented strategies function as organizational architectures that support ethical governance, TQM implementation, learning systems, and sustainable performance (Freire et. al.,2020; Bamel et al., 2021; Wang et al., 2023).

Employee-level orientation → Cultural orientation → Strategic orientation, with correlation strength increasing as customer service orientation moves from individual attributes to organizational systems and strategic structures. This suggests that customer service orientation operates not only as a behavioral trait but as a multi-level institutional mechanism that supports TQM implementation. Internal systems (leadership, training, fulfillment, processes, continuous improvement) show stronger associations than external systems (supplier quality management), indicating that customer orientation is more deeply embedded in internal governance and quality infrastructures than in supply-chain structures. This pattern is consistent with contemporary organizational models of TQM and service governance (ASQ, 2024; Newman et al., 2020; Hoang et al., 2023).

The results provide strong empirical evidence that customer service orientation is positively and significantly associated with TQM practices across employee, cultural, and strategic levels. Customer orientation functions as a structural enabler of quality management, strengthening leadership systems, workforce development, continuous improvement, employee fulfillment, and process management, while maintaining a weaker but significant relationship with supplier quality systems.

Propose Total Quality Management Framework

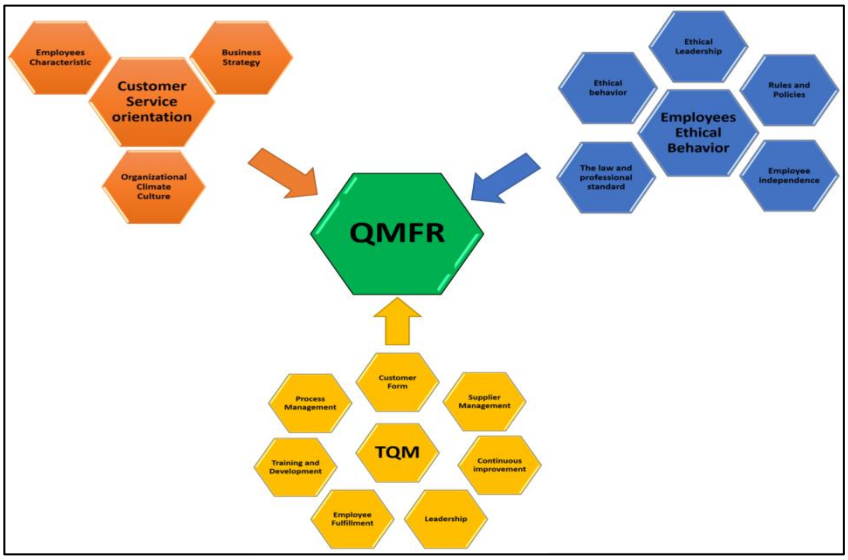

Fig. 1. Quality Management Framework

The resort quality management framework interrelates customer service orientation and employee ethical behavior with the total quality management of resorts. Overall, it shows highly significant correlations among the three variables. Customer service orientation in terms of employee characteristics, organizational climate culture, and business strategy was rated high by the resort employees and emphasized highly significant correlations with total quality management in terms of customer focus, supplier quality management, continuous improvement, leadership, employee fulfillment, training and development, and process management. Similarly, the employee ethical behavior in terms of ethical leadership, rules and policies, employee independence, law and professional standard, and ethical behavior obtained high ratings in the assessment of the resort employees and obtained high significant correlations with the total quality management in terms of customer focus, supplier quality management, continuous improvement, leadership, employee fulfillment, training and development, and process management. The framework will guide resort managers on attaining total quality management in managing and operating resorts.

The proposed framework presents a dynamic interrelationship among Customer Service Orientation (CSO), Employee Ethical Behavior (EEB), and Total Quality Management (TQM) within resort operations in the Central

Luzon Region. These three variables form a mutually reinforcing system wherein improvements in one area significantly influence the others. Customer Service Orientation, encompassing employee characteristics, organizational climate, and business strategy, drives proactive engagement with clients, which is foundational to service quality. This orientation correlates with TQM dimensions such as customer focus, continuous improvement, and employee fulfillment, suggesting that a strong customer-centric culture enhances process quality and service outcomes. Simultaneously, Employee Ethical Behavior, defined by ethical leadership, rule adherence, professional standards, independence, and conduct, fosters trust, consistency, and fairness—key pillars of TQM. Its high correlation with TQM practices implies that ethical employees comply with standards and actively contribute to sustainable quality improvements. Notably, the intersection of CSO and EEB suggests that customer-first values are best upheld by ethically grounded personnel, and vice versa; a respectful, ethical workplace further motivates service excellence. These dual influences culminate in TQM, which acts as a product and a catalyst of these values, reinforcing customer focus, process integrity, leadership efficacy, and continuous development.

The employee's ethical behavior is blue because it is the color of trust, honesty, dependability, serenity, harmony, tranquility, and peace. It implies conservatism and promotes organizational harmony and client loyalty in business. Based on the mean assessments, the components were arranged from highest to lowest: ethical behavior, law and professional standard, employee independence, ethical leadership, and rules and policies. The customer service orientation is orange. The color orange is often associated with enthusiasm, excitement, and warmth. It can create a sense of fun, energy, and playfulness. Orange is a bright, attention-grabbing color that can help a brand stand out in a crowded market. It can be used to draw attention to specific areas of the marketing materials, such as calls to action or important information. Based on the mean assessments, the components were arranged from highest to lowest: organizational climate, employee characteristics, and business strategy.

Total quality management is green because it represents nature, harmony, and expansion. It represents stability, harmony, and healing since it is safe and soothing. In business, green is advantageous for anything related to health and healing. It also stands for stability and independence. Based on the mean assessments, the components were arranged from highest to lowest: supplier quality management, leadership, process management, customer focus, continuous improvement, employee fulfillment, and training and development. Customer service orientation, ethical behavior, and total quality management are intricately linked, as strong customer service can foster ethics and quality management, while total quality management can strengthen ethical behavior. The following framework illustrates the correlations between the three. Customer service orientation: the mindset and approach of an individual or an organization that places a high value on meeting the needs and expectations of their customers. It involves understanding and anticipating customers' needs, providing prompt and courteous service, and resolving any issues or concerns promptly and effectively. Quality management: activities and processes to ensure that products or services consistently meet or exceed customer expectations. It involves systematically controlling and improving all aspects of an organization's operations to ensure that its products or services are of the highest quality possible.

Correlations:

a. Customer service and ethical behavior: Customer orientation and ethical behavior are essential for building a positive reputation for an organization. Companies prioritizing customer satisfaction and ethical behavior are more likely to be viewed as trustworthy and reliable by customers, leading to increased loyalty and positive word-of-mouth recommendations.

b. Customer service and total quality management. Both customer service and TQM are customer-focused. Customer service aims to provide customers with an exceptional experience, while TQM seeks to offer products and services that meet or exceed customer expectations.

c. Ethical behavior and total quality: Both ethical behavior and TQM are customer-focused. Ethical behavior requires treating customers fairly and honestly, while TQM aims to provide products and services that meet or exceed customer expectations.

Customer service orientation, ethical behavior, and TQM share common goals and principles. All three approaches are focused on meeting customer needs and expectations, empowering employees, improving processes, and taking responsibility for the impact of business practices. By combining these three concepts, organizations can create a culture of excellence that delivers superior products and services to their customers while upholding ethical standards and social responsibility.

The researcher's role in this framework is to quantify and contextualize these relationships through systematic inquiry, serving as the input by operationalizing the constructs, gathering empirical data from resort employees, and analyzing the strengths of association among variables. The significant correlations indicate that improvements in CSO and EEB reliably enhance TQM outcomes. From a visual and symbolic perspective, colors represent each core variable—orange for CSO, highlighting enthusiasm and proactive service; blue for EEB, symbolizing trust and harmony; and green for TQM, denoting stability and sustainable growth. Despite their shared focus on customer satisfaction, the three constructs differ in their orientation: CSO emphasizes external responsiveness, EEB focuses on internal moral conduct, and TQM integrates both to establish system-wide excellence. Hence, the framework not only elucidates how CSO and EEB function as inputs to TQM but also serves as a strategic guide for resort managers aiming to embed quality and ethical service as organizational cornerstones.

Ultimately, by understanding and leveraging these interdependencies, resorts can cultivate a culture that consistently delivers high-quality, ethical, and customer-centered experiences.

4. Conclusions and recommendations

Based on the study's results, the following conclusions were drawn: The integration of customer service orientation and ethical behavior produced higher quality management outcomes in Central Luzon resorts. Resorts with strong alignment between service values and ethics demonstrated better organizational performance indicators. The strongest combined effect was observed in service consistency and internal work climate. Ethical behavior showed a strong association with customer trust, loyalty, and satisfaction. Honesty, transparency, and fairness were the most dominant ethical attributes linked to positive customer responses. Ethical conduct also correlated with higher employee morale and service performance. Total Quality Management in resorts was directly driven by the enforcement of service orientation and ethical behavior. Quality management was not achieved through systems alone but through consistent human behavior and organizational culture. TQM emerged as behavior-anchored rather than process-isolated. A statistically significant relationship existed among customer service orientation, ethical behavior, and quality management practices. Higher moral standards in service delivery were directly associated with stronger quality management outcomes. These variables functioned as interdependent components of resort management performance.The developed Resort TQM Framework established a cyclical relationship among customer service orientation, ethical behavior, and quality management. Each construct reinforced the others in a continuous system. The framework formally structured this interdependence into a unified quality model.

Resorts may correct weak personalized service delivery by implementing mandatory service-skills training focused on empathy, communication, and guest engagement, with quarterly refresher programs for all frontline staff. Resorts may address weak ethical consistency by institutionalizing a formal code of ethics, conducting compulsory ethics training, and integrating ethical compliance into performance evaluation systems. Resorts can fix weak quality integration mechanisms by adopting standardized TQM tools, including service audits, behavior monitoring systems, and structured feedback-to-action protocols. Local government units may resolve infrastructure gaps by prioritizing access roads, transport systems, utilities, sanitation, and tourism signage directly serving resort zones. Technical education institutions may close skills mismatches by establishing industry-aligned training centers and delivering modular, certification-based hospitality programs linked to resort workforce needs. Resorts may improve weak employee morale and retention by implementing structured career pathways, fair compensation systems, continuous professional development programs, and formal staff recognition mechanisms. Resorts may eliminate communication gaps with guests by deploying integrated digital feedback platforms, multichannel communication systems, and standardized complaint-response protocols. Future researchers may conduct a longitudinal study examining how sustained integration of customer service orientation, ethical behavior, and quality management affects resort performance over time, including customer loyalty, employee retention, and financial sustainability, which were not included in the present study.

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Exploring the relationship between user perceptions and continuous usage intention of digital banking services among Generation X in Pampanga: A moderated correlational study

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Abstract

This study determined the relationship between user perceptions and the continuous usage intention in digital banking. It utilized both descriptive and correlational research designs to examine the respondents' perceptions in relation to their continuous usage intention of digital banking services. The respondents are the Gen X who are actively engaged in the usage of digital banking services. The survey instrument was distributed online through Google Form link. A total number of 141 valid responses were collected and analyzed through correlational analysis which examine the relationships between the variables in the study. Modified Regression Analysis within Structural Equation Modeling (SEM) was employed to examine the interaction effects of age, gender, income level and digital literacy, between the variables. Descriptive analysis is used in the study to summarize participants' perceptions and frequency of usage of digital banking. The result of the study implies the significant relationship of the user perceptions to the continuous usage intention of digital banking services, although perceived trust implies a weak to moderate relationship. The result implies that age and digital literacy do not significantly change the correlations between variables, although gender moderates the influence of convenience and income level moderates perceived usefulness. The relationships shown significant results and consistent viewpoints of the respondents, thus highlighting a strong, consistent and reliable findings. These will serve as support for banks to focus on strengthening the positive user perceptions and to maintain the beneficial, convenient and reliable digital experiences for the continued usage of digital banking services.

Keywords: digital banking, Gen X, perceived usefulness, perceived ease of use, perceive trust, perceived risk convenience, continuous usage intention

Exploring the relationship between user perceptions and continuous usage intention of digital banking services among Generation X in Pampanga: A moderated correlational study

1. Introduction

We live in an era of rapid technological advancement, with digitalization penetrating all areas of the economy (Ran et al., 2023). These rapid technological advancements together with changing consumer preferences have also significantly transformed the financial industry's landscape. The integration of digital technology into banking operations has led to an essential transformation, giving rise to what is now known as Digital Banking. Digitalization requires the banking industry to adopt new technology to enable substantial business breakthroughs such as improving customer experience and engagement, optimizing operations, and developing new business models (Khin & Ho, 2020).

Digital banking has introduced a new era for consumers, placing convenience, accessibility, and personal experience at the lead. It comprises how banks and financial institutions analyse and meet the needs of their consumers and focusing in delivering the best banking experience to their consumers. Banks must revise their business plans to improve client interactions, optimize middle and back-office operations, preserve competitiveness, and prepare for future challenges (Kitsios et al., 2021). Customers are increasingly inclined to switch to alternative financial institutions if their current banks fail to offer online banking services, highlighting the growing importance of digital access in customer retention (Guru et al., 2003). The banking industry needs to strengthen and ensure the provision of quality web-based technological services to meet the competition while also addressing customer needs (Zaidi & Rupeika-Apoga, 2021). It is apparent that the traditional banking services are no longer sufficient to meet the diverse and changing needs of today's consumers.

With the Philippines' growing economy, digital banking services have gained considerable demand. Banks need to embrace technology advancement to stay competitive in the ever-growing market, where digital providing financial competitors are entering. Banks in the Philippines began adopting electronic banking as early as the year 2000, aligning with the global shift towards financial technology or "fintech" (Mendoza et al., 2020). It facilitated the financial institutions to improve their efficiency, drive growth, and ensure convenience to their consumers and consequently attract new clients. Digital banking introduced innovative and personalize services that caters the ever-changing demands of consumers promoting consumers' sustained usage.

While digital banking is user-friendly, it may not appeal to all age groups. Customers' preferences for digital and Omnichannel banking vary by generation, yet some cherish the personal touch of engaging with a representative at their financial institution (Rodrigues, et al., 2023). Generation X, born between 1965 and 1980, has witnessed the progression of technology, from traditional banking methods to digital platforms. This is one of the main demographics that the banking industry must consider. Many people in this generation are in their prime working years, handling both personal and family finances, which increases their demand for efficient banking solutions. They value the convenience of having access to their financial accounts at any time and from any location, thus digital banking is a practical option. However, Generation X sees internet banking as unsafe because of concerns about online fraud, data security, and difficulties in accessing the platforms and the loss of face-to-face interactions. In a dialogue of BusinessWorld Online (2024) with a 49 years old housewife Irene A. Zapata, she stated that "I prefer going to the bank because it feels safer for my money." "There's also a teller whom I can easily talk to if I have any questions. Online banking seems to have too many steps, and I find that hard." This demonstrates how Generation X values security, simplicity, and human interaction in banking. Concerns about online fraud and the complexity of digital platforms indicate that trust and ease of use remain significant impediments for this demographic.

While much of the existing study on digital banking is aimed at younger generations, it is also important to understand what motivates Generation X to continue utilizing these services. Key factors such as perceived usefulness, ease of use, trust, risk, and convenience determine not only initial acceptance but also long-term usage. This study will concentrate on Gen X in the Philippines, looking at how these characteristics influence their intention to continue using technology. It will explore into how Gen X consumers perceive and respond to these features, with the goal of revealing trends and insights that can assist banks and financial institutions in improving their digital services to better suit the demands of this demographic.

Objectives of the Study - The research aims to examine the factors related to consumers' intention to continue using digital banking services. As digital banking becomes progressively more prevalent, it is necessary for banks and financial institutions to understand the key factors that encourage sustained usage. This research focuses on five critical variables: perceived usefulness, perceived ease of use, perceived trust, perceived risk, and convenience. The study of the relationships among these variables will identify how they are associated with consumers' intention to use digital banking services and will provide valuable insights into what motivates users to continue engaging with digital banking services. This may enable the financial institutions to address potential challenges and will help identify strategies to build customer confidence and boost customer satisfaction. Through this study, banks or financial institutions can better understand how to maintain significant user groups particularly the Gen X. Since the Gen X group are typically on their prime earning and spending years, the banks will fully understand their perceptions on digital banking services through this study. Banks can modify their digital offerings to meet the specific concerns and expectations of the Gen X, and this will help banks to make their platforms more desirable and trustworthy for them. Through this, financial institutions can improve customer loyalty, satisfaction, and promote long-term adoption of digital banking services.

2. Methods

Research Design - This study utilized both descriptive and correlational research designs to examine the respondents' perceptions in relation to their continuous usage intention of digital banking services. The correlational research design determined the relationship of independent variables namely, perceived usefulness, perceived ease of use, perceived trust, perceived risk and convenience with the dependent variable continuous usage intention of digital banking services. It identified and measured the degree and direction of correlations between these independent and dependent variables. Structural Equation Modeling (SEM) was also utilized to assess the interaction effects between user perception variables and the moderating variables, allowing for an assessment of whether these demographic and psychographic factors influenced the strength or direction of the relationships among the variables.

Data Collection - This study focused on the residents of Pampanga, specifically the Gen X individuals, ages 45-60 years old, who actively use digital banking services within the province, and they served as the primary participants. Participants were chosen using convenience sampling, with the online survey link distributed via social media platforms and email. A total number of 141 valid responses were collected and analyzed, which justified the minimum sample size requirement for the statistical techniques employed in this study, including correlation and structural equation modeling (SEM). A normality test was conducted to assess whether the data followed a normal distribution. The results indicated that the data were not normally distributed, confirming the non-parametric nature of the dataset. Given this, Spearman's rho correlation was employed to examine the strength and direction of relationships between the study variables.

Survey Instrument - Data of the study was measured using a survey questionnaire that was develop using various literatures. The first three independent variables Perceived Usefulness, Perceived East of Use, and Perceived Trust, all have 4 constructs (Ly, B. & Ly, R, 2022), the independent variable Perceived Risk (Lee, 2009) and (Hanafizadeh & Khedmatgozar, 2012) contains 3 items that were used in the study. Additionally, Convenience with three indicators (Shahid Iqbal et al., 2018) were used in the study. The dependent variable intention to use digital banking system (Anouze & Alamro, 2019) was utilized in the study. The questionnaire that was being utilized in this study was adopted from previously validated studies to ensure the relevance and accuracy of the items in measuring the key constructs. The initial part of the questionnaire includes the demographic and psychographic profiles of the respondents specifically the age, gender, income level and digital literacy. The second part of the instrument covers the perception of the respondents on the constructs identified in the study. The survey questionnaire has been modified to align with the current study, focusing specifically on the parameters related to the use of digital banking systems.

Data Analysis - Correlational analysis was accomplished to examine the relationships between the correlated independent and dependent variables in the study. Correlation coefficients were estimated and analyzed to provide a clear understanding of the direction and strength of the relationships among the variables. Data were gathered through an online survey using a four-point Likert scale, where 1 represented strongly disagree and 4 represented strongly agree. The Shapiro–Wilk normality test was accomplished to determine the appropriate statistical process for the study. The results implied that the data were not normally distributed, therefore, Spearman's rank correlation was employed to examine the strength and direction of the relationships between the variables.

The moderating variables, which included demographic and psychographic characteristics such as age, gender, income level, and digital literacy, were examined to determine their effects on the strength of the relationship between the independent variables namely perceived usefulness, perceived ease of use, perceived trust, perceived risk, and convenience and the dependent variable, continuous usage intention of digital banking services. These moderating variables were perceived to either strengthen or weaken the relationships between the independent and dependent variables.

To analyze the interaction effects of the moderating variables, Modified Regression Analysis within Structural Equation Modeling (SEM) was employed to examine the interaction effects between user perception variables and the independent variable, continuous usage intention of digital banking services. This approach enabled the analysis to determine whether demographic and psychographic factors influenced the strength or direction of the relationships among the study variables. This method also helped evaluate whether different user groups experienced digital banking differently and which factors were most significant in promoting continued usage.

Ethical Considerations - The researcher strictly complied with ethical guidelines to protect participants' rights, privacy, and well-being. Before participating in the study, respondents were clearly informed of its objectives and procedures. Only eligible participants were included, and involvement was completely voluntary. Electronic informed consent was secured prior to completing the online survey, and no coercion was applied. The research was classified as low risk. While some questions may have caused minor discomfort, no physical harm was anticipated. Participants were also advised that they could withdraw from the study at any time without any negative consequences. All collected information was handled with strict confidentiality and used exclusively for research purposes, in accordance with Republic Act No. 10173, or the Data Privacy Act of 2012. Participants had the option to decline future storage or use of their data. The results may be shared in academic presentations or publications, and respondents may request a summary of the findings. The researcher maintained integrity by ensuring that data were neither fabricated nor misrepresented and that all sources were properly acknowledged.

3. Results

The results of the data analysis were conducted to examine the relationships among users' perceptions of digital banking services and their continuous usage intention. The analysis employed a descriptive–correlational research design, wherein descriptive statistical techniques were used to summarize respondents' demographic characteristics and perception measures. Spearman's rank-order correlation analysis was applied to determine the strength and direction of the relationships among the key study variables. Furthermore, moderation analysis using regression-based interaction terms within a structural equation modeling (SEM) framework was conducted to assess whether respondent characteristics, specifically age, gender, income level, and digital literacy, influence the relationships between user perceptions and continuous usage intention. The findings provide practical validation on both the direct connections and the conditional effects that influence continuous usage intention in digital banking.

Profile of the Respondents - About 75.2% of the respondents are between the ages of 45 and 50. This is followed by those aged 51-55 years old at 19.1%, with only 5.7% being 56 years or older. The result shows that almost of the participants are in the middle age range. The gender profile of the respondents which shows that most of the participants are female representing 73.8% of the samples, while the 26.2% are males. There are no respondents from the LGBT. The study indicates that the study is largely represented by female respondents. The result for the monthly income level of the respondents shows that a significant number of the respondents, which is about 41.1% earn between Php 31,000.00 and 40,000.00 per month. The 22% of the respondents have an income ranging from Php 21,000.00 to 30,000.00, the same with the earners of Php 41,000.00 to 50,000.00 per month. Only 5% earn less than Php 20,000.00 per month, while the 9.9% of the respondents earned Php 51,000.00 or more. This indicates that most of the respondents are in the middle income group.

The result frequency of usage of the respondents shows that most respondents use digital banking on a regular basis, with 45.39% indicating frequent use and 33.33% stating that they always use it. About 20.57% utilize it on instances, while only 0.71% use digital banking services rarely. This shows that the respondents have significant level of reliance on digital banking services. The result on the confidence in the usage of digital banking services of the respondents shows that 56.74% of the respondents agreed and 43.26% strongly agreed that they were confident in their usage of digital banking services. The result of the respondents' familiarity with the online security services of the digital banking services. The 60.99% of the respondents agreed, likewise 39.01% strongly agreed that they are familiar with online security services, this indicates a high degree of security awareness among the users.

On securing their digital banking applications, the majority of respondents, about 70.92% agreed and 28.37% strongly agreed to know how to take precautions in securing their online banking apps, while 0.71% strongly disagreed. This indicates that majority of the respondents are aware in keeping their digital banking services app secure. More than half of the respondents about 52.48% believe they can address problems on their own likewise about 3.55% strongly agreed, the result indicates that many users are confident in their ability to handle regular concerns. These shows a reasonable level of self-reliance and familiarity with the digital technologies. Conversely, a considerable percentage of responders of 43.26% lack confidence in handling technical disputes on their own, same with the 0.71% who strongly disagree that they can handle technical disputes on their own. The study also identified and stated the digital banking products which were most frequently used by the respondents. This additional information as illustrated in Table 9 was included to strengthen the study thru the practical insight into the respondents' actual digital banking behavior. The identified frequently used products helped support the interpretation of perception and usage intention results. This ensures that the findings were supported in respondents' real usage experiences rather than their perceptions alone.

According to the data gathered, the respondents primarily utilize digital banking for routine and necessary tasks. The most frequent activities are transferring money (96.5%), paying bills (93.6%), and checking account balances (85.8%). This indicates that most consumers utilize the internet to finish short and regular transactions that were previously completed when visiting a physical branch. Since these are primary banking needs, it clearly appears that mostly everyone frequently uses these functions. Mobile wallet top-ups (57.4%) and transaction record tracking (51.8%) are moderately used services. These activities are still essential, but not everyone needs them on a regular basis. Some users may only top up their mobile wallets when needed, while others may not check their transaction history frequently except when unusual transaction occurs.

Loan management is the least used service (24.1%). This could be because many of the responders do not have active loans. For those who do, some may choose to go to the branch or speak directly with bank officials about loans, which include larger financial considerations and more detailed requirements. Loan services in digital banking may be limited or unfamiliar to users.

Descriptive Analysis of User Perceptions and Continuous Usage Intention of Digital Banking Services - The descriptive analysis of each study variables was conducted to provide an overview of respondents' perceptions and usage intentions toward the digital banking services. Descriptive statistics, including the mean and standard deviation, were used to summarize respondents' level of agreement with the survey items consistent to perceived usefulness, perceived ease of use, perceived trust, perceived risk, convenience, and continuous usage intention measured using a four-point Likert scale. Mean scores were interpreted based on the following scale: 3.25–4.00 (Strongly Agree), 2.50–3.24 (Agree), 1.75–2.49 (Disagree), and 1.00–1.74 (Strongly Disagree). The analysis indicates a general understanding of the average and variability of responses and will serve as basis for subsequent correlational and moderation analyses.

The results indicate that respondents have generally positive views of digital banking services. Perceived usefulness noted the highest mean score ($M = 3.63$, $SD = 0.37$), the results show that respondents generally view digital banking as helpful, convenient, and capable of improving how the respondents manage their financial activities. Perceived ease of use also obtained a positive score ($M = 3.37$, $SD = 0.414$), suggesting that respondents consider digital banking platforms easy to understand and operate. Perceived trust scored a mean score of 3.06 and SD of 0.31, believe that the digital banking system is trustworthy and can keep their privacy and financial data safe, however, their responses scale to agree level which means respondents are still cautious of the digital banking system and desire robust security reassurance. Perceived risk had a mean of 3.24 and SD of 0.485, respondents generally agreed that using digital banking systems does not involve high risk. Instead, they believe that the digital banking system provides enough security and support from the bank to make them at ease on their financial transactions. Continuous usage intention showed a positive mean score ($M = 3.38$, $SD = 0.407$), suggesting that respondents are willing to continue using digital banking services for their everyday financial activities. Overall, the findings reveal positive and consistent perceptions across all variables.

Correlation Matrix of User Perception Variables and Continuous Usage Intention of Digital Banking Services - In this study, the correlation strength is ranked using the guidelines established by Schober and Schwarte (2018). Coefficients ranging from 0.40-0.69 suggest a moderate correlation, while values greater than or equal to 0.70 indicate a strong correlation, and those below 0.40 suggest weak relationships. This model is consistent with how the current study perceived the strength of the relationships between digital banking users' perceptions and their continuous usage intention. The results as shown in Table 1 below imply that all independent variables have a significant positive relationship with continuous usage of digital banking services among Gen X users, with p-values less than .001. Perceived usefulness ($\rho = 0.65$) and perceived ease of use ($\rho = 0.625$) both demonstrated moderate positive correlations with continuous usage intention. Perceived trust ($\rho = 0.394$) showed a weak-to-moderate positive relationship, while perceived risk ($\rho = 0.519$) showed a moderate positive relationship. In this study, perceived risk reflects users' sense of safety and confidence rather than exposure to threats. Convenience recorded the strongest relationship ($\rho = 0.759$), indicating a strong positive correlation with continuous usage intention.

Table 1

Relationship Analysis of User Perceptions and User's Continuous Usage Intention

CSR Dimensions		CU	Analysis
PU	Spearman's rho	0.65	Moderate Correlation
	Sig. (2-tailed)	< .001	
PEOU	Spearman's rho	0.625	Moderate Correlation
	Sig. (2-tailed)	< .001	
PT	Spearman's rho	0.394	Weak Correlation
	Sig. (2-tailed)	< .001	
PR	Spearman's rho	0.519	Moderate Correlation
	Sig. (2-tailed)	< .001	
CON	Spearman's rho	0.759	Strong Correlation
	Sig. (2-tailed)	< .001	

Moderation Analysis of the User Profiles on the Relationship of User Perceptions and Continuous Usage Intention of Digital Banking Services - Based on the moderation results as shown in Table 2, the interactions terms involving age have p-values greater than 0.05 and z-values below ±1.96, thus, age does not influence the user perceptions for continuous usage intention of digital banking.

Table 2
Age - Moderation Estimate

Indicators	Estimate	Z	p
PU ✻ Age:	-0.08091	-0.6917	0.49
PEOU ✻ Age:	0.0894	0.8790	0.38
PT ✻ Age:	-0.0672	-0.5200	0.6
PR ✻ Age:	-0.0174	-0.1840	0.85
CON ✻ Age:	0.112	1.3109	0.19

The moderation results involving gender as shown in Table 3 imply that it partially moderates the relationship between user perceptions and continuous usage intention of digital banking services particularly convenience. All other user perceptions and continuous usage intention of digital banking services were not statistically significant, suggesting that gender does not moderate these relationships.

Table 3
Gender - Moderation Estimate

	Estimate	Z	p
PU ✻ Gender:	-0.244	-1.64	0.1
PEOU ✻ Gender:	-0.0524	-0.37	0.712
PT ✻ Gender:	0.206	1.02	0.305
PR ✻ Gender:	-0.034	-0.265	0.791
CON ✻ Gender:	-0.264	-2.53	0.011

Based on the moderation results shown in Table 4 below, the interaction terms involving income level indicates that it partially moderates the relationship between user perceptions and continuous usage intention of digital banking services specifically perceived usefulness. All other user perceptions and continuous usage intention of digital banking services were not statistically significant, suggesting that income level does not moderate these relationships.

Table 4
Income Level (Monthly) - Moderation Estimate

	Estimate	Z	p
PU ✻ Income Level (Monthly):	-0.1389	-2.13	0.033
PEOU ✻ Income Level (Monthly):	0.0252	0.424	0.672
PT ✻ Income Level (Monthly):	0.0531	0.818	0.414
PR ✻ Income Level (Monthly):	0.0118	0.213	0.831
CON ✻ Income Level (Monthly):	-0.0429	-0.896	0.37

Based on the moderation results as shown in Table 5, the interactions terms involving digital literacy have p-values greater than 0.05 and z-values below ±1.96, thus, digital literacy does not moderate the relationship between user perceptions and continuous usage intention of digital banking services.

4. Discussion

The results show that among the Gen X users, perceived usefulness has a statistically significant and moderately positive connection with continued usage of digital banking services. The result indicates that if the user perceives the digital banking services to be useful and beneficial, it will strengthen their intention of continuous usage of digital banking services. The users' willingness to keep using digital banking services becomes more encouraging when they believe that the services improve their financial tasks. This is confirmed in the study of Davis et al. (1989), in which a person believes that adopting to a given system will increase their performance. It is also aligned with the Technology Acceptance Model (TAM) in the study of Davis (1989), which is stated that perceived usefulness is a key determinant for the adoption and continued usage of technology, moreover, users are more inclined to embrace and continuously use a system when they believe it enhances their performance. Usage of digital banking services helps them transfer money faster, pay bills conveniently, and monitor finances without going to the bank, therefore making them more committed to using it in the long run. This is confirmed in the study of Keni (2020), where it was stated that customers see technology as an advantage for the usefulness of a service.

The analysis demonstrates a moderately positive correlation between perceived ease of use and intention to use continuously. This suggests that the users tend to maintain their intention of usage of the digital banking services when they feel that the digital banking system is easy to use, clear and easy to navigate. This shows that Gen X users are more likely to stick with digital banking services if the system is simple to learn, understand, and operate. The study of Komulainen & Saraniemi (2019) support the results that when users find an application straightforward and easy to manage, they are more likely to engage with it constantly and develop a positive view on its use. Also to confirm the results of the study, Usman et al. (2021), stated that customers will seek solutions that are easy to learn to perform certain tasks with essentially the same activities.

The results for the relationship between perceived trust and continuous usage intention among the Gen X users implies that perceived trust has a weak correlation but statistically significant positive correlation with continued usage intention of digital banking services. This indicates that the users may tend to continue using digital banking system if they find it reliable. The result on the significant role of trust is supported in the study of Hanaysha (2022), where it was stated that users with higher levels of trust are more inclined to accept and engage with digital banking services due to reduced uncertainty and increased confidence in system security. In the study of Zhou (2011), it was stated that, the role of trust changes overtime, while trust is very important during the initial adoption stage, its influence on continuous usage diminishes as users gain experience and familiarity with the system.

The results reveal a moderate positive relationship between perceived risk and continuous usage intention among Gen X users. This indicates that if the users perceived lower risk in the usage of digital banking system, they likely would feel less unease that their finances are at stake, therefore, it encourages them for continuous usage. While a positive relationship between perceived risk and continuous usage intention may initially appear contradictory, this result is justified by the way perceived risk is specified in the study. Specifically, higher perceived risk scores indicate reduced perceptions of risk and increased confidence in the security, reliability, and safety of digital banking systems. This enhanced sense of security encourages users to maintain their continued use of digital banking services. Therefore, greater user confidence is associated with a higher intention to continue using digital banking services. To support this finding, Aldammagh et al. (2021) reported that lower perceived risk significantly increases the usage and acceptability of digital banking services, as users are more willing to adopt and continue using such services when they feel secure and confident in the system.

The results show that convenience has a strong positive connection with continuous usage intention. It has the strongest relationship with the continuous usage intention of the respondents and the effective influence of long-term usage. This indicates that the users are encouraged to use digital banking services if they feel that they save time and effort when use and when it provides easy navigation and it supports fast financial transactions. The studies of Shankar et al., (2021) and Khan et al., (2022), states that customers value time savings, mobility, less effort, and overall efficiency, making online convenience an appealing prospect for the banking business, thus strengthening the findings of the study. The selective moderation effects found in this study are consistent with Yoon and Steege (2013) findings which stated that adoption of Internet banking is mostly driven by users' perceptions, with demographic and personal attributes only having an impact in certain situations. This explains why among Gen X users, age and digital literacy do not significantly change the correlations between the key user perceptions and continuous usage intention, although gender moderates the influence of convenience and income level moderates perceived usefulness.

5. Conclusion and recommendation

This research has provided a practical understanding of why users continue to use digital banking services, which can be valuable for banks or financial institutions, or anyone interested in how technology features, user benefits, and perceived security shape costumers' financial decisions. Correlation analysis demonstrates that all observed user perception variables are significantly associated with the continuous usage intention of digital banking services among Gen X users. The moderation analysis of the study indicates that the continuous usage intention of digital banking services is primarily driven by perceptual factors, with demographic characteristics influencing only specific aspects rather than uniformly shaping user behavior. The study reveals that the Gen X users are more likely to use basic and routine digital banking services including fund transfers, bill payments, and account balance inquiries. This usage pattern supports the study's results that convenience and usefulness are the most important elements that encourages continued usage intention.

Based on the findings, the following were recommended: Banks should provide robust importance on improving the usefulness and maintain the simplicity of the digital banking application for the Gen X users. Banks should be able to provide to its users the capability to view and monitor their balances real time, transfer funds from one account to another, pay their bills faster without going to the payment centers, and other financial transactions that can be done only in the physical bank branches before. To maintain and improve these beneficial features, banks should be able to stay up to date on the recent trends and features other banks offers and these offerings may be adopted to stay viable. Banks should ensure that all the services they offer work consistency and reliably as they have promised, with reduced errors and service interruptions, and the transactions are processed on time. Banks must maintain consistent compliance with regulatory bodies' rules and policies by incorporating the regulatory requirements into their system structure, security controls, and operational procedures. To ensure the customers feel secure and comfortable on their financial interests while using digital banking services, banks must maintain the reliability of the services. Banks also should have constant system monitoring which requires banks to conduct regular system audits and maintain incident response plans. Future researchers are encouraged to extend this study by using a larger and more diverse sample to strengthen the generalizability of the results. Studying different age groups or comparing Gen X with younger or older users may provide deeper insights into the differences in their continuous usage behavior. Future studies may also adopt longitudinal research designs to observe how user perceptions and intentions change over time.

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Banana Heart *(Musa Acuminate Colla)* bud crackers

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Abstract

This study developed Banana Heart Bud Crackers as a value-added, plant-based snack product utilizing banana heart bud as an underutilized local food resource. Specifically, the study aimed to determine the process involved in developing banana heart bud crackers, identify the required ingredients, tools, and equipment, assess the sensory acceptability of the processed product in terms of appearance, aroma, texture, and taste, and create Information, Education, and Communication (IEC) materials for knowledge dissemination. A research-and-development approach was employed to formulate and produce banana heart bud crackers through standardized preparation procedures, including raw material selection, cleaning and pre-treatment, mixing, shaping, cooking, and packaging. Documentation of the development process included step-by-step workflow descriptions and process notes to support product replication. The study also compiled a detailed inventory of ingredients and the necessary tools and equipment used during production to guide small-scale and community-based implementation. Sensory evaluation was conducted using a structured evaluation tool to gather acceptability ratings from selected evaluators, focusing on the product's appearance, taste, texture, and aroma. Findings indicated that banana heart bud crackers are feasible to produce and can achieve favorable sensory acceptability, with crisp texture and balanced flavor noted as key attributes when proper preparation and moisture control are applied. To support dissemination and adoption, IEC materials were developed highlighting the product concept, ingredient list, equipment needs, step-by-step processing guide, and basic quality and safety reminders. The study demonstrates the potential of banana heart bud crackers as an innovative snack alternative and a practical option for livelihood and microenterprise initiatives, while contributing to food resource utilization through product innovation.

Keywords: banana heart bud, cracker development, product innovation, sensory evaluation

Banana Heart *(Musa Acuminate Colla)* bud crackers

1. Introduction

Chips are widely consumed snack products commonly produced from thinly prepared plant materials that are fried or baked to achieve a crisp texture and low moisture content, which supports convenience and shelf stability for consumers (Starch in Food, 2024). Because chips readily accept added seasonings and flavor profiles and can be produced in small batches, they provide a practical platform for transforming locally available agricultural materials into value-added snack innovations. This flexibility is especially relevant in communities where plant resources are abundant but not consistently utilized for processed food products. One promising but often underutilized ingredient is the banana heart bud also referred to as banana blossom or banana inflorescence the edible flower structure of banana plants (*Musa* spp.). Recent literature describes banana inflorescence as an agricultural by-product with "untapped potential" for food and health applications and notes that it contains bioactive constituents such as phenolics and flavonoids that may support functional food development when appropriately processed (Senevirathna & Karim, 2024). Related reviews further emphasize that banana blossoms contain phytochemical constituents associated with antioxidant-related properties, strengthening the rationale for exploring banana heart bud beyond traditional culinary use and into value-added product development (Suffi et al., 2021).

In addition to compositional value, banana flower has been investigated for potential relevance to metabolic health. Experimental evidence reported beneficial effects of banana flower and pseudostem supplementation on hyperglycemia-related outcomes and on advanced glycation end-products (AGEs) in a diabetic animal model, indicating a scientific basis for continuing exploration of banana blossom as a functional food ingredient (Bhaskar et al., 2011). While health-oriented claims for new snack products must be carefully supported and appropriately scoped, these findings suggest that banana heart bud has properties worthy of further investigation as an ingredient in plant-based snack formulations. At the same time, for any novel snack innovation to be viable, consumer acceptance remains crucial; sensory analysis is therefore fundamental in product development because it captures how consumers perceive key quality attributes such as appearance, aroma, taste, and texture attributes that strongly influence liking and product choice (Ruiz-Capillas et al., 2021).

Developing banana heart bud chips also aligns with broader sustainability priorities by promoting more resource-efficient use of agricultural materials and supporting waste reduction, consistent with the intent of SDG 12 (Responsible Consumption and Production) (United Nations, n.d.-a). At the community level, value-adding local crops and by-products can contribute to livelihood opportunities consistent with SDG 8 (Decent Work and Economic Growth) while supporting food options that contribute to well-being consistent with SDG 3 (Good Health and Well-Being) (United Nations, n.d.-b, n.d.-c). To strengthen adoption beyond the research setting, translating standardized procedures and findings into Information, Education, and Communication (IEC) materials can support practical knowledge transfer and correct practice among intended users, including community producers, schools, and small enterprises (Food and Agriculture Organization of the United Nations [FAO], n.d.). In this context, transforming banana heart bud into a shelf-stable chips product offers a realistic pathway to improve local food utilization, reduce avoidable waste, and promote a locally sourced snack alternative compatible with community-based food innovation and sustainable food systems.

This study aimed to develop Banana Heart Bud (Musa acuminat Colla) Crackers and evaluate their acceptability as an innovative and value-added snack product. Specifically, it sought to determine the standardized process involved in the development of the crackers, identify the ingredients, tools, and equipment used in their preparation, and assess the sensory acceptability of the developed product in terms of appearance, aroma, texture, and taste. Additionally, the study aimed to create Information, Education, and Communication (IEC) materials to support knowledge dissemination and promote the product for potential community utilization and small-scale enterprise development.

2. Methods

Research Design - The study utilized an experimental research-and-development design to develop Banana Heart Bud *(Musa acuminate Colla)* Crackers. Three different formulations with varying ingredient proportions and processing methods were prepared as treatments to determine the most acceptable product. Sensory evaluations focusing on appearance, taste, texture, and aroma were conducted using a 9-point hedonic scale with thirty (30) respondents composed of students, faculty members, and community residents. The data gathered from the evaluations were analyzed to determine the formulation that produced the most acceptable and potential market-ready Banana Heart Bud crackers.

Participants of the Study - The participants of this study consisted of thirty (30) individuals, including students, faculty members, and community residents. The participants were selected purposively to obtain varied perspectives on product acceptability. The group included ten (10) students, ten (10) faculty members, and ten (10) community members, all of whom served as sensory evaluators of the Banana Heart Bud *(Musa acuminate Colla)* crackers. The researcher assessed the product's sensory attributes appearance, aroma, texture, and taste using the prescribed evaluation tool, and their responses provided the primary data for determining the overall acceptability of the developed product.

Data Gathering Instrument - The data gathering instrument used in this study was a sensory evaluation questionnaire patterned after the 9-point Hedonic Scale developed by Peryam and Pilgrim (1957). The scale ranges from 1 (Dislike Extremely) to 9 (Like Extremely), with the middle points indicating varying degrees of liking or disliking. This instrument is widely used in sensory evaluation to measure consumer acceptability of food products based on key attributes such as appearance, aroma, texture, and taste. The participants' ratings served as the primary basis for determining the overall sensory acceptability and preferred formulation of the Banana Heart Bud *(Musa acuminate Colla)* crackers.

Data Gathering Procedure - The data gathering procedure for this study involved several steps to ensure the systematic development and evaluation of the Banana Heart Bud *(Musa acuminate Colla)* crackers. Fresh banana heart buds were collected from Barangay Cagbunga, Gainza, Camarines Sur and prepared through standard pre-processing procedures such as washing, boiling, slicing, and soaking. Three product formulations were then prepared by varying the proportions of ingredients and processing methods while maintaining the general preparation procedure. The banana heart bud was mixed with rice flour, garlic powder, onion powder, salt, pepper, and water, then molded and steamed for about 15 minutes. After steaming, the product was cooled, sun-dried for two to three days until adequately dry, and then fried to achieve the desired crispness before packaging. Sensory evaluation was conducted with thirty (30) purposively selected participants composed of ten (10) faculty members, ten (10) students, and ten (10) community residents who evaluated the crackers' appearance, taste, texture, and aroma using a 9-point Hedonic Scale ranging from 1 (Dislike Extremely) to 9 (Like Extremely). After the evaluation, all accomplished forms were collected, the responses were tallied, and the data were organized for analysis to determine the most acceptable formulation of the developed product.

Ethical Considerations - The ethical considerations for this study ensured the protection of participants' rights and well-being throughout the sensory evaluation of the Banana Heart Bud *(Musa acuminate Colla)* crackers. Informed consent was obtained from all participants after explaining the purpose of the study, the procedures involved, and any minimal risks associated with tasting the samples. Participation was voluntary, and confidentiality was maintained by keeping all responses anonymous and using the collected data strictly for research purposes. Participants were also informed that they could withdraw from the study at any time without any consequence. The safety of the product samples was ensured through proper sanitation, safe food handling, and clean preparation and serving practices during the evaluation. Additionally, the study supported sustainability by utilizing locally available banana heart buds and promoting their value-added use, which contributes to reducing food waste and supporting community-based food innovation.

Data Analysis **-** The data analysis for this study involved the evaluation of sensory data gathered from the respondents. The responses from the sensory evaluation forms were analyzed using the weighted mean to determine the overall acceptability of the Banana Heart Bud *(Musa acuminate Colla)* crackers. Each sensory attribute appearance, aroma, texture, and taste was rated using a 9-point Hedonic Scale, and the average ratings were computed for each treatment. The mean scores for each attribute were then calculated and compared to determine the most acceptable formulation. The treatment that obtained the highest overall mean score was considered the most preferred formulation of the developed Banana Heart Bud crackers.

3. Results and Discussion

Development of the Product - The development of Banana Heart Bud *(Musa acuminate Colla)* Crackers was guided by the goal of creating a nutritious, innovative, and value-added snack product using locally available banana heart buds through a simple and practical production process. A research-and-development (R&D) approach was applied, and the product was refined through several kitchen trials, testing, and modifications to improve the quality and acceptability of the crackers. The procedure began with the collection of fresh banana heart buds from Barangay Cagbunga, Gainza, Camarines Sur, followed by pre-processing such as washing, boiling, slicing, and soaking to remove impurities and reduce bitterness. The prepared banana heart bud was then combined with rice flour, garlic powder, onion powder, salt, pepper, and water to form a uniform mixture. The mixture was molded and steamed, cooled, sun-dried for two to three days to remove moisture, and finally fried to achieve the desired crisp texture.

In Trial 1, the initial formulation used higher proportions of rice flour and smaller amounts of seasoning. After the kitchen test, the crackers were found to have a bland taste and less desirable crispness. The texture was also observed to be slightly coarse, which was attributed to the proportion of flour and limited seasoning. As a result, adjustments were made in the succeeding trial by increasing the amount of seasonings and modifying the ingredient proportions to enhance the flavor and texture of the product. In Trial 2, the proportions of garlic powder and onion powder were increased, and the amount of rice flour was slightly reduced while maintaining the same basic preparation procedure. This adjustment aimed to enhance the flavor and improve the eating quality of the crackers. Although the second trial produced better results compared to the first, the product still required improvement in taste and texture. Finally, Trial 3 further adjusted the ingredient proportions by increasing the seasonings and reducing the flour content while modifying the drying and molding process. The result produced crackers with improved crispiness, balanced flavor, and more acceptable texture. Among the three trials, Trial 3 obtained the most desirable characteristics and was selected as the final formulation for sensory evaluation. Each trial was carefully documented until the most suitable formulation and preparation process were achieved, supporting the development of a potential market-ready Banana Heart Bud crackers product.

Materials Used in the Preparation of the Product – The materials used in the preparation of Banana Heart Bud *(Musa acuminate Colla)* Crackers consisted of both the ingredients required for the formulation and the tools and equipment necessary to ensure accurate measurement and proper processing. The study utilized banana heart bud as the primary ingredient, which was combined with rice flour, garlic powder, onion powder, black pepper, iodized salt, and water to produce the mixture used in forming the crackers. The banana heart bud served as the core raw material of the product, while rice flour acted as the base ingredient that helped bind the mixture and create the structure of the crackers. Seasonings such as garlic powder, onion powder, black pepper, and iodized salt were added to enhance the flavor and improve the overall palatability of the product. Oil was used during the frying process to achieve the desired crisp texture of the crackers.

To ensure consistency and proper preparation, several tools and equipment were utilized during the production process. A chopping board and kitchen knife were used to cut and prepare the banana heart bud. Measuring cups and measuring spoons were used to obtain accurate amounts of ingredients, while a mixing bowl served as the container for combining the ingredients into a uniform mixture. A steamer was used to cook the molded mixture before the drying process. A molder was utilized to shape the mixture into uniform portions, and a cooling rack or tray was used during the sun-drying process to remove excess moisture from the product. Finally, a frying pan or stove was used to fry the dried crackers, and the finished product was allowed to cool before packaging. These materials supported the standardized preparation of Banana Heart Bud crackers by ensuring proper measurement, preparation, processing, and cooking to produce a crisp and acceptable snack product.

Table 1

Sensory Evaluation of Heart Bud (Musa acuminate Colla) Crackers

Sensory parameters	T1	T2	T3
Appearance	6.3	7.4	8.3
Aroma	6.2	6.6	7.2
Texture	6.1	7.5	8.4
Taste	5.5	6.8	8
Mean	6.02	7.07	7.9

Legendary: 1.00-1.89= Dislike Extremely, 1.90-2.78= Dislike Very Much, 2.79-3.67= Dislike Moderately, 3.68-4.56= Dislike Slightly, 4.57-5.45= Neither like nor dislike, 5.46-6.34=Like Slightly, 6.35-7.23= Like Moderately, 7.24-8.12=Like Very Much. 8.13-9.01=Like Extremely

Table 1, presents the distribution of the respondents who participated in the sensory evaluation of the Banana Heart Bud *(Musa acuminate Colla)* crackers. A total of thirty (30) evaluators were selected through purposive sampling and were composed of three equal groups: ten (10) faculty members, ten (10) students, and ten (10) community residents from Barangay Cagbunga, Gainza, Camarines Sur. Each group represented 33.33% of the total participants, indicating a balanced composition of evaluators. This table is important because it shows that feedback on the product’s appearance, taste, texture, and aroma was obtained from different sectors, allowing the study to capture varied perceptions and preferences for a more reliable assessment of the overall acceptability of the Banana Heart Bud crackers.

Appearance - The sensory evaluation results of the Banana Heart Bud (*Musa acuminate Colla*) crackers showed that the appearance scores for each treatment were T1 = 6.3, T2 = 7.4, and T3 = 8.3 based on the 9-point Hedonic Scale. These results indicate that the visual quality of the product was generally acceptable across all treatments, with T3 obtaining the highest mean score for appearance. The results demonstrate a clear improvement in appearance from T1 to T3 (6.3 → 7.4 → 8.3), suggesting that the later formulation produced crackers with better visual appeal. This improvement may be attributed to better thickness consistency, more uniform color, and improved crispness of the final product after steaming, drying, and frying. These visual characteristics are important in snack products because consumers often judge the quality and attractiveness of food based on its appearance before tasting it.

In product development, visual attributes such as color, shape, and texture play an important role in influencing consumers’ first impressions and willingness to try a new product. Crackers that appear evenly shaped, thin, and golden-brown are generally perceived as crisp and of higher quality. Therefore, the improved appearance of the product in Treatment 3 likely contributed to its higher acceptability among the evaluators. The importance of appearance in food acceptability is supported by previous studies. According to Sánchez and Barrachina (2021), visual attributes significantly influence consumer perception of food quality and can affect purchasing decisions. Similarly, Relloso (2025) emphasized that the visual appeal of a developed food product—such as color, uniformity, and presentation—plays a significant role in shaping consumer acceptance and overall product evaluation during sensory testing. This supports the finding that the higher appearance rating of Treatment 3 reflects improved visual acceptability, which may enhance consumer interest and increase the product’s potential as a marketable snack item (Relloso, 2025).

Aroma - The sensory evaluation results for the Banana Heart Bud *(Musa acuminate Colla)* crackers showed that the aroma scores for each treatment were T1 = 6.2, T2 = 6.6, and T3 = 7.2 using the 9-point Hedonic Scale. Based on the hedonic interpretation, these mean scores fall within the “Like Slightly” to “Like Moderately” categories, indicating that the respondents generally had a favorable perception of the aroma across all treatments. Among the three formulations, Treatment 3 obtained the highest aroma rating, while Treatment 1 received the lowest mean score. The gradual increase in scores from T1 to T3 suggests that the adjustments made in the ingredients and processing methods improved the aromatic quality of the crackers. The higher aroma rating in T3 may be attributed to the balanced combination of banana heart bud and seasonings such as garlic powder and onion powder, which contributed to a more pleasant and appealing smell during frying and tasting.

This result indicates that aroma played a supportive role in the overall sensory acceptability of the product. Although the differences among treatments were not extremely large, the increasing scores suggest that improvements in formulation and processing helped enhance the aromatic profile of the crackers. Aroma is an important sensory attribute because it influences the consumer's expectation of flavor and quality even before the product is tasted. A pleasant smell can stimulate appetite and increase interest in trying the product. The importance of aroma in food acceptability is supported by previous studies. Research by Spence et al. (2015) explains that aroma significantly contributes to flavor perception and can influence consumer preference and eating behavior. Similarly, studies in sensory science indicate that aroma-related cues play an essential role in shaping the overall eating experience and product quality perception. These findings support the result that the improved aroma score of Treatment 3 indicates a more appealing sensory profile, which contributes to the overall acceptability and potential market appeal of the Banana Heart Bud crackers.

Texture - The sensory evaluation results for the Banana Heart Bud *(Musa acuminate Colla)* crackers showed that the texture scores for each treatment were T1 = 6.1, T2 = 7.5, and T3 = 8.4 based on the 9-point Hedonic Scale. These ratings indicate that respondents generally liked the texture of the product across all treatments, with scores ranging from "Like Slightly" to "Like Very Much." Among the three formulations, Treatment 3 received the highest mean score for texture, followed by Treatment 2, while Treatment 1 obtained the lowest rating. The data show a noticeable improvement from T1 to T3 (6.1 → 7.5 → 8.4), suggesting that the later formulation produced a more desirable crispness and mouthfeel. This improvement may be attributed to adjustments in ingredient proportions and the drying process, which contributed to a thinner, crispier cracker after frying.

Texture is a critical sensory attribute for snack products such as crackers because consumers generally expect them to be crunchy and crisp. Products with a firm and crispy texture are often associated with freshness and better eating quality. Therefore, the higher texture rating in Treatment 3 indicates that this formulation achieved the most acceptable crispness and mouthfeel among the samples evaluated by the respondents. The importance of texture in snack acceptability is supported by previous studies. Research by Weng and Du (2020) explains that crispiness plays a major role in consumer satisfaction with snack foods, as crunchy textures are often associated with higher product quality. Similarly, Xie et al. (2021) emphasized that texture-related sensory perception significantly influences consumer preference and overall food acceptability. These findings support the results of the study, showing that the higher texture score of Treatment 3 contributed to the improved sensory acceptability of the Banana Heart Bud crackers and strengthened their potential as a desirable snack product.

Taste – The sensory evaluation results for the Banana Heart Bud *(Musa acuminate Colla)* crackers showed that the taste scores for each treatment were T1 = 5.5, T2 = 6.8, and T3 = 8.0 based on the 9-point Hedonic Scale. According to the scale descriptors, T1 falls within the "Neither Like nor Dislike" to slightly acceptable range, T2 falls under the "Like Slightly" category, while T3 approaches the "Like Very Much" level of acceptability. The results indicate a clear improvement in taste from T1 to T3 (5.5 → 6.8 → 8.0), suggesting that the adjustments made in the third formulation significantly improved the flavor balance and overall palatability of the crackers. The higher score of T3 implies that the combination of banana heart bud and seasonings such as garlic powder and onion powder produced a more appealing flavor that was preferred by the evaluators.

Taste is one of the most important sensory attributes influencing consumer acceptance of snack products. Consumers generally prefer snacks that provide a balanced and pleasant flavor, and improvements in seasoning and ingredient proportions can greatly enhance the eating experience. The higher taste rating obtained by Treatment 3 suggests that this formulation successfully achieved a more desirable flavor profile, making it more satisfying to the respondents compared to the earlier treatments. The importance of taste in food acceptability is supported by previous studies. Research by Schneider and Pitt (2019) emphasizes that taste plays a central role in food preference and consumption behavior, as it directly influences consumer satisfaction and repeat purchase decisions. Similarly, studies on snack food products indicate that well-balanced seasoning and flavor significantly improve consumer liking and product marketability. These findings support the result that the improved taste score of Treatment 3 contributed to the higher overall acceptability of the Banana Heart Bud crackers and strengthened their potential as a marketable snack product.

Information, Education, and Communication (IEC) Material - The Information, Education, and Communication (IEC) material developed in this study took the form of a flyer intended to promote Banana Heart Bud *(Musa acuminate Colla)* Crackers and raise awareness about the product. The flyer was designed to provide concise and audience-friendly information about the crackers, including their origin, preparation process, nutritional value, and potential health benefits. The information was presented using a visually appealing layout with clear text and images to effectively communicate the product's value and attract the attention of potential consumers. The flyer served as both an educational and promotional tool targeted for distribution to key stakeholders such as local consumers, students, community members, small-scale food entrepreneurs, and local organizations who may support the adoption, production, and consumption of the product. To increase reach and accessibility, dissemination of the IEC material was planned through both physical distribution and digital sharing. Physical distribution may include community events, school activities, product demonstrations, and tasting activities, while digital sharing may involve institutional social media platforms, email communication, and local information channels. The development of the IEC material was intended not only to promote the product but also to translate the results of the research into a practical and community-oriented resource that supports awareness, knowledge dissemination, and potential adoption of the Banana Heart Bud crackers as an innovative and sustainable snack product. The IEC flyer contributes to making the product innovation more transferable and understandable to stakeholders by packaging key information in a format commonly used for public education and awareness-building, and recent public health literature recognizes print media as a practical channel that can shape awareness when integrated thoughtfully with other communication approaches (Kanchan et al., 2024).

4. Conclusions and Recommendation

This study successfully developed Banana Heart Bud *(Musa acuminate Colla)* Crackers through a research-and-development approach that documented a standardized production procedure and identified the necessary ingredients, tools, and equipment required for preparation. The step-by-step process from raw material preparation, mixing, steaming, sun-drying, and frying proved feasible and replicable for small-scale production and community-based food processing. The sensory evaluation results demonstrated that the developed crackers were generally acceptable to the thirty (30) evaluators in terms of appearance, taste, texture, and aroma. Among the three treatments, the third formulation obtained the highest overall ratings across most sensory attributes, indicating better flavor balance, improved crispiness, and more appealing appearance. These results suggest that adjustments in ingredient proportions and processing methods significantly influenced the sensory acceptability of the product. The development of the Information, Education, and Communication (IEC) material further strengthened the study by presenting the product innovation in a user-friendly format suitable for awareness building and knowledge dissemination. The IEC flyer supports potential adoption of the product by local communities, students, and small-scale food entrepreneurs interested in developing value-added food products using locally available resources.

Based on the findings of the study, it is recommended that future research conduct shelf-life testing to determine the storage stability and safety of the Banana Heart Bud crackers under different packaging and environmental conditions. Further studies may also explore additional flavor variations or seasoning formulations to enhance consumer appeal and improve market competitiveness. Increasing the number and diversity of sensory evaluators is also recommended to strengthen the reliability and generalizability of the acceptability results. A comprehensive nutritional analysis is likewise suggested to determine the detailed nutrient profile of the product and support potential health-related claims. Lastly, the developed IEC materials may be further enhanced into digital formats, training modules, or community workshops to promote wider dissemination and encourage microenterprise development within local communities.

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Proposed Agri-farm tourism framework in Central Luzon Region

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Abstract

Central Luzon, Philippines, has recently seen a rise in Agri-farm tourism. The provinces of Nueva Ecija, Tarlac, and Pampanga are among those in this region that produce the most rice and corn in the Philippines and are noted for their extensive agricultural acreage. This study aimed to propose a framework for Agri-farm tourism in the Central Luzon Region. The researcher determined the perceived Agri-farm tourism development in Central Luzon Region in terms of learning and educational activities improvements, cultural development, community participation, thriving local economy, and income generation. It tested the significant difference in the responses when grouped according to the profile of the respondents and tested the significant relationship among variables. Data were analyzed using Percentages, Weighted Mean, the Shapiro-Wilk Test, the Kruskal-Wallis test, the Mann-Whitney U test, and Spearman Rho. The variables included are factors, impact, competitiveness, and Agri-farm development. The rho-value represents the correlation coefficient, which indicates the strength and direction of the relationship between the variables. All correlations are highly significant, with p-values of 0.000. Therefore, the relationships observed between variables are not likely due to chance. The correlation coefficient between factors and impact is 0.651, which indicates a moderately positive relationship between the two variables. As factors increase, so does the impact. The correlation coefficient between factors and competitiveness is 0.744, indicating a moderately positive relationship between the two variables. Moreover, the correlation coefficient between factors and Agri-farm development is 0.716, indicating a moderately positive relationship between the two variables. The correlation coefficient between impact and competitiveness is 0.885, indicating a strong positive relationship between the two variables. As impact increases, competitiveness also increases. The correlation coefficient between impact and Agri-farm development is 0.844, indicating a strong positive relationship between the two variables. The correlation coefficient between competitiveness and Agri-farm development is 0.856, indicating a strong positive relationship between the two variables. The study concluded that the Proposed Agri-Farm Tourism Framework could have significant implications for the Central Luzon Province, particularly for the Agri-farm tourism sector. If successfully implemented, the framework could lead to improved tourism experiences, economic growth, environmental sustainability, community development, and improved regional governance and coordination.

Keywords: Agri-farm, tourism, competitiveness, digital marketing, sustainability, descriptive survey, Central Luzon, Philippines

Proposed Agri-farm tourism framework in Central Luzon Region

1. Introduction

Agri-farm tourism is a rapidly growing trend in the global tourism industry. Travelers are increasingly looking for one-of-a-kind and genuine experiences that let them get in touch with nature, discover traditional farming methods, and sample regional and organic cuisine. The World Tourism Organization (UNWTO 2021), reported that, with an annual growth rate of between 5 and 15%, Agri-farm tourism is one of the sectors of the global tourism business that is expanding the fastest. Italy, France, Spain, and Portugal are among the top European countries for Agri-farm tourism, while the United States, Canada, and Australia are significant global players. The tendency towards Agri-farm tourism has escalated because of the COVID-19 epidemic as tourists are seeking outside and socially isolating activities. This has increased interest in rural and farm-stay lodging, outdoor pursuits like farming and hiking, and local culinary experiences. It is anticipated that the Agri-farm tourism trend would expand as more tourists look for distinctive and green living experiences that support rural economies while promoting local cultures and customs.

In recent years, Central Luzon, Philippines, has seen a rise in Agri-farm tourism. The provinces of Nueva Ecija, Tarlac, and Pampanga are among those in this region that produce the most rice and corn in the Philippines and are noted for their extensive agricultural acreage. Several farms in Central Luzon have transformed themselves into tourist attractions with the goal of promoting Agri-farm tourism by providing tourists with a range of experiences and activities. Agri-farm tourism provides a distinctive approach for tourists to take in Central Luzon's rich agricultural legacy, while also promoting sustainable farming methods and helping out local people. Despite the growing interest in Agri-farm tourism, several challenges and gaps need to be addressed to ensure its sustainable development. In the international climate, there is a lack of consensus on the definition of Agri-farm tourism and the criteria for its successful implementation. However, in the Philippines, while Agri-farm tourism has been identified as a priority area, there is still a need for clearer policies, guidelines, and standards to ensure that the industry develops in a sustainable and responsible manner (Robles & Agasa, 2019). Hence, identifying the key factors contributing to Central Luzon Agri-farm tourism's success and the challenges that need to be addressed, improving infrastructure, marketing, and promotion, adhering to quality standards, and providing support and coordination are all necessary steps to be taken to address these challenges.

The theoretical foundations of this study were drawn from the concepts of sustainable tourism and community-based tourism. Sustainable tourism is a type of tourism that considers the social, economic, and environmental impacts of tourism activities and aims to minimize the negative impacts and maximize the positive impacts. On the other hand, community-based tourism involves local communities' participation in tourism development and the distribution of benefits among the community members. Furthermore, the sources of the questionnaires and their relation to the study: Mendoza, (2020), Stakeholders' perspective on competitiveness and sustainability of farm destinations. The study provides insights into the stakeholders' perspective on the competitiveness and sustainability of farm destinations. The questionnaire developed by Mendoza can be used to assess the stakeholders' perception of the proposed Agri-farm framework's competitiveness and sustainability. The questionnaire adapted from Netmatpour and Khodadadi can be used to identify the potential economic benefits of the proposed Agri-farm framework. The questionnaire can also help assess the level of interest of tourists in participating in Agri-tourism activities and their willingness to pay for such activities. While the study of Wong, et.al (2018), examines the factors that affect the competitiveness of agritourism in Malaysia. The questionnaire developed by Tan et al. can be used to assess the factors that affect the competitiveness of the proposed Agri-farm framework. The questionnaire can also help identify the strengths and weaknesses of the Agri-tourism industry in the study area. Furthermore, the questionnaires developed by these authors can provide valuable insights into the proposed Agri-farm tourism framework's competitiveness, sustainability, impact and potential socio-economic benefits, and factors that affect its success.

The use and impact of digital marketing in the context of Agri-farm tourism is a common theme among the three independent variables in the proposed Agri-farm tourism framework study. The use of digital marketing to receive advertisements for Agri-farm tourism can significantly affect how competitive these enterprises are. This is so that these organizations may reach a bigger audience, improve brand recognition, and eventually draw in more customers using digital marketing methods. Agri-farm tourism industry can set themselves apart from their rivals and become industry leaders by employing digital marketing efficiently. Another factor to consider into account is the effect of digital marketing for Agri-farm tourism on consumers' buying intentions. Agri-farm tourism must have a strong online presence that can draw in and hold the attention of customers as more and more customers use digital media to plan and study their travel experiences. This industry can raise the possibility that potential customers will make a purchase by creating a favorable impression of their goods and services in the minds of those consumers by employing efficient digital marketing methods.

Finally, the effectiveness of digital marketing has a significant influence on how competitive Agri-farm tourism is. Customers have a wide range of options when picking their travel experiences in today's digital age. As a result, Agri-farm tourism must always work to stay competitive by giving distinctive experiences, supplying top-notch customer service, and utilizing successful marketing techniques. These can improve their exposure, develop relationships with customers, and ultimately acquire a competitive edge in the market by utilizing digital marketing platforms. The adoption and impact of digital marketing can have a substantial impact on the competitiveness of Agri-farm tourism businesses, which links the three independent variables in the proposed Agri-farm tourism framework. By examining these factors, the study hopes to offer perceptions that can aid in enhancing their marketing approaches, luring more clients, and eventually succeeding in the fiercely competitive Agri-fam tourism. Agriculture plays a crucial role in the economy of many countries, providing food, raw materials, and employment opportunities. Agri-farm tourism is a type of tourism that focuses on experiencing and learning about agricultural life and practices, and it has gained popularity as a way to promote sustainable rural development (Pandey, 2018).

According to Lin, (2021), online reviews have a positive effect on satisfaction, and technology self-efficacy enhances this effect. Moreover, tourists' experience and satisfaction with Agri-farm tourism indicates that performance expectancy, habit, demand conditions, and situation resources have a positive impact on tourists' experience and satisfaction (As-Saber & Haque, 2019). However, the effect of informativeness and two-way communication on tourists' satisfaction in Agri-farm tourism shows that both variables have a positive impact on tourists' satisfaction (Li & Li, 2018). On the other hand, Wang et.al (2020) stated that Agri-farm tourism has a potential means of promoting a thriving local economy and income generation in rural areas and the potential to generate significant economic benefits for local communities.

Furthermore, the framework will provide a systematic approach to developing Agri-farm tourism that considers the unique features of the agricultural and rural environments. It aims to facilitate the creation of memorable and meaningful experiences for tourists while providing economic benefits for local communities. The framework considers the role of technology in enhancing tourists' experiences and addresses the need for effective communication and information provision. Hence, The study aims to address the need for a comprehensive framework for Agri-farm tourism development that considers the diverse needs and preferences of tourists and local communities. This study will benefit the farm owners/operators and managers for this service as a guide on how they will operate toward a competitive and sustainable business enterprise. It will give them opportunities to change practices and embrace digital technology in their marketing efforts. For the farmers and employees, it will serve as a guide to increased job security as Agri-farm tourism can provide a stable source of income as it diversifies the farm's revenue streams and reduces reliance on traditional farming practices, Agri-farm tourism setting can provide farmers employees with opportunities to learn new skills and develop their existing ones, such as customer service, event management, and marketing as well. For the families and residents living in the nearby areas, Agri-farm Tourism has the potential to bring significant benefits to families and residents living in the nearby areas. Which include job opportunities, economic growth, cultural exchange, education and awareness, and improved living conditions. The Department of Tourism can help promote Agri-farm tourism in Central Luzon by highlighting the region's unique agricultural heritage and creating opportunities for visitors to experience it firsthand while supporting the local economy. For the local government of Central Luzon and to the community as a whole, it has the potential to bring significant benefits these include increased revenue, promotion of sustainable agriculture, preservation of cultural heritage, job creation, and promotion of tourism providing infrastructure and facility funding. For the tourists, the study has the potential to provide tourists with a range of benefits, including an authentic cultural experience, educational opportunities, adventure and recreation, health and wellness, and culinary experiences.

The expected result is a significant contribution to the existing body of knowledge by providing a practical and effective approach to promoting sustainable tourism development in rural areas through agriculture. This framework is based on the region's unique cultural, environmental, and economic contexts, providing a clear path toward the integration of agriculture and tourism for the benefit of local communities, farmers, and tourists alike. Moreover, digital marketing has been proven to be an effective tool in promoting tourism activities, particularly in terms of reaching a broader audience and increasing sales. The study only focused on Agri-farm tourism within the Central Luzon region, with a scope limited to determining the main variables. The factors influencing the Adoption of Digital Marketing in Receiving Agri-farm tourism-related Advertisements in terms of technology self-efficacy, usefulness, active control, two-way communication, and synchronicity. Assessing the competitiveness of Agri-farm tourism in terms of created resources, support resources, situational conditions, and destination management as perceived by the tourists. Determining the Impact of Digital Marketing Sites of Agri-farm Tourism on Customers' Purchase intentions in terms of performance expectancy, hedonic motivation, habit, interactivity, informativeness, and perceived relevance on respondents. Determining the perceived Agri-farm Tourism Development in Central Luzon Region in terms of Learning and Educational Activities Improvements, Cultural Development, Community Participation, Thriving Local Economy, and Income generation.

Based on the results of the study, the Proposed Agri-farm tourism framework proved to be a highly effective strategy in promoting sustainable agriculture while simultaneously boosting tourism in rural areas. This framework seeks to provide tourists with an immersive experience of farm life, showcasing the unique aspects of agricultural practices, particularly in the Central Luzon Region. Not only does it educate visitors on the importance of sustainable farming, but it also encourages them to support local farmers and businesses. By emphasizing the Agri-farm tourism framework, government, and Agri-farm tourists sites owners and operators can work together to create a more sustainable and vibrant rural economy, benefiting both the farmers and the tourists who visit. Further, the main focus of the study on the Proposed Agri-farm tourism framework in the Central Luzon Region is to create a structured and well-integrated framework that will promote Agri-farm tourism in the region.

2. Method

Research Design - This is a quantitative descriptive research design with utilized descriptive correlation analysis to assess competitiveness and determine the impact of digital marketing on-Agri-farms in Central Luzon. This descriptive correlation analysis was used in this study as it tested the relationship among impact of digital marketing, competitiveness of farm tourism site and Agri-farm tourism development.

Participants of the Study - Purposive random sampling was used in the selection of Agri-farm tourism. Only those Agri-farms accredited by the Department of Tourism (DOT) in the provinces of Central Luzon(Region III) – Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, and Zambales were considered. the researcher ensured an equal distribution based on the percentage computation based on the total population to get the appropriate sample proportion per province. The respondents of the study were 340 that is 18yrs.old and above and regardless of gender Agri-farm tourists in Central Luzon. The sample was determined using the Rao soft Calculator considering the 95% confidence level and 5%

margin of error. As seen in the table, the list of Agri-farms sites DOT accredited is based on DOT database. The tourist arrival was computed and estimated from the farm owner on a monthly basis.

Data Collection Instrument - The instruments of the study were adapted from various studies. Part 1 of the instrument is to present the demographic profile of the respondents in terms of sex, age, educational status, annual income, current employment status and province. Part two of the instrument was to assess the Factors Influencing the Adoption of Digital Marketing in Receiving Agri-Farm Tourism-related Advertisements in terms of technology self-efficacy, usefulness, active control, two-way communication, and synchronicity. This was adapted by Orias, and Borbon, (2022), in their study entitled Adoption of digital marketing among farm tourism sites in the Province of Central Luzon, Philippines. Part three of the instrument is to determine the impact of digital marketing of Agri-farm tourism sites in Central Luzon Province on customers' purchase intentions in terms of performance expectancy, hedonic motivation, habit, interactivity, informativeness, and perceived relevance on respondents. This is adapted from Alalwan, (2018). Investigating the impact of digital advertising features on customer purchase intention. Part four of the instrument is to measure the level of competitiveness of farm tourism sites in Central Luzon in terms of Created Resources, Support Resources, Situational Condition, Demand Condition, and Destination Management. This is adapted from Mendoza, (2020) on his study entitled Stakeholders' perspective on competitiveness and sustainability of farm destinations. Lastly, part five of the instrument is to determine the Agri-Farm Tourism Development in the Central Luzon Region in terms of Learning and Educational Activities Improvements, Cultural Development, Community Participation, Thriving Local Economy, and Income Generation. This was adapted from the study of Netmatpour, and Khodadadi, (2020). Farm Tourism as driving force for socio-economic development: a benefits viewpoint from Iran.

Content validation of the questionnaire was done by at least three experts in the field of study including a research expert, an agriculturist, and an academician. Pilot testing and content validation were performed on the instrument by 30 Agri-farm tourists in one Agri-farm in Zambales which is not part of the actual target Agri-farm tourism. The Cronbach Alpha Reliability Coefficient Test was used to assess the instrument's dependability. The majority of the study's variables have good Cronbach's alpha values greater than 0.90. The result of reliability statistics showed that the computed Cronbach's alpha value for factors influencing the adoption of digital marketing in receiving farm tourism-related advertisements (0.955), the impact of digital marketing of farm tourism sites (0.976), Competitiveness of Farm Tourism Sites (0.987) and Farm Tourism Development (0.976) signifies that the instrument has strong or excellent internal consistency in the rule of thumb.

Data Gathering Procedure - Based on the target respondents' accessibility and readiness to supply the necessary information, the researcher obtained the data. After the research instrument was approved, the researcher gave the operators of the Agri-farms a letter of permission to carry out the study in their locations, which was signed by the researcher and acknowledged by the research adviser of the Graduate School of Lyceum of the Philippines University - Batangas. Following granting the request, the researcher used the actual face-to-face distribution of the questionnaire to a randomly selected group of Agri-farm tourists. A message addressed to the respondents was additionally affixed to the survey, together with the data privacy agreement. The data was gathered, using the researcher's phones, laptops, and the use of hard copies used at the face-to-face interviews.

Data Analysis - Frequency and percentage distribution were used to describe the demographic profile of the respondents. Weighted mean and rank were used to determine factors, impact, competitiveness, and farm development. The result of the Shapiro-Wilk Test showed that the p-values of all variables are less than 0.05 which means that the data set was not normally distributed. Therefore, the Mann-Whitney U test for two groups and the Kruskal Wallis test for more than two groups were used as part of the non-parametric tests to determine the significant differences. Likewise, Spearman rho was used to test the significant relationship. All analyzes were performed using SPSS version 26.

Ethical Consideration - The researcher has made sure to secure letters requesting the permission of the officers in charge of the Agri-farm tourism sites in the region, before conducting a study. Once permitted the letter to the selected respondents was distributed. All information that has been provided was kept in strict confidence and shall be used only for academic purposes. Participants also have the right to withdraw from the study at any time if they so desire. The principle of informed consent entails researchers providing sufficient information and assurances about participating for respondents to fully understand the implications of participation and make an informed, considered, and freely given decision about whether to participate, without any pressure or coercion. The adherence to the data privacy act of 2012 has been discussed with the respondents to give clarity on the confidentiality of the information to be disclosed

3. Result and discussion

Table 1

Relationship Among Variables of the Proposed Agri-farm tourism Site in Central Luzon Province

Paired Variables	rho-value	p-value	Interpretation
Factors & Impact	0.651**	0.000	Highly Significant
Factors & Competitiveness	0.744**	0.000	Highly Significant
Factors & Agri-Farm Development	0.716**	0.000	Highly Significant
Impact & Competitiveness	0.885**	0.000	Highly Significant
Impact & Agri-Farm Development	0.844**	0.000	Highly Significant
Competitiveness & Agri-Farm Development	0.856**	0.000	Highly Significant

Table 1 shows the results of the correlation analysis between different variables. The variables included are factors, impact, competitiveness, and Agri-farm development. The rho-value represents the correlation coefficient, which indicates the strength and direction of the relationship between the variables. The p-value measures the level of significance of the correlation coefficient. The table indicates that all correlations are highly significant, with p-values of 0.000. This means that the relationships observed between variables are not likely due to chance.

The correlation coefficient between factors and impact is 0.651, which indicates a moderately positive relationship between the two variables. As factors increase, so does the impact. Thus, the observed correlation confirmed that as enabling digital marketing factors improved, their positive impact on consumers also increased. The moderately positive relationship between factors (e.g., technology self-efficacy, usefulness, active control, two-way communication, and synchronicity) and impact (e.g., performance expectancy, informativeness, hedonic motivation, habit, and purchase intention) was strongly supported by digital marketing and tourism adoption literature. Alabi and Fasina (2019) demonstrated that enabling factors such as perceived usefulness and technology self-efficacy significantly enhanced user outcomes, including engagement, satisfaction, and behavioral intention. Similarly, Mendoza (2020) found that effective digital marketing factors directly influenced consumer impact variables such as performance expectancy, informativeness, and purchase intention in farm tourism.

The correlation coefficient between factors and competitiveness is 0.744, indicating a moderately positive relationship between the two variables. This suggests that as factors increase, competitiveness also increases. The moderately strong positive relationship between factors and competitiveness aligned with the destination competitiveness and digital transformation literature. Mariani (2020) emphasized that digital capabilities, innovation, and managerial competencies were critical in enhancing destination competitiveness This finding suggested that agri-farm tourism destinations that strengthened digital marketing adoption factors were better able to differentiate themselves, attract visitors, and compete effectively in the tourism market. Moreover correlation coefficient between factors and Agri-farm development is 0.716, indicating a moderately positive relationship between the two variables. This suggests that as factors increase, Agri-farm development also increases. The correlation coefficient between impact and competitiveness is 0.885, indicating a strong positive relationship between the two variables. This suggests that as impact increases, competitiveness also increases.

The strong positive relationship between impact and competitiveness was one of the most theoretically consistent findings. Mariani (2020) argued that destinations delivering strong experiential and behavioral impacts gained competitive advantage through loyalty and positive word-of-mouth. This strong correlation suggested that when digital marketing produced meaningful impacts on consumers, agri-farm tourism destinations became more competitive. The correlation coefficient between impact and Agri-farm development is 0.844, indicating a strong positive relationship between the two variables. This suggests that as impact increases, Agri-farm development also increases. The strong positive relationship between impact and agri-farm development aligned with studies linking consumer behavior to rural development outcomes. Thus, the results confirmed that stronger consumer impacts translated into more substantial agri-farm development outcomes.

The correlation coefficient between competitiveness and Agri-farm development is 0.856, indicating a strong positive relationship between the two varables. This suggests that as competitiveness increases, Agri-farm development also increases. The strong positive correlation between competitiveness and agri-farm development was well supported by the competitiveness and rural sustainability literature. Carchedi and Timpano (2021) demonstrated that competitive agri-farm tourism destinations generated greater economic benefits, improved local product reputation, and enhanced rural livelihoods. This finding indicated that competitiveness functioned as a critical conduit through which agri-farm tourism development was realized.

Overall, the correlation analysis in Table 1 provided strong empirical support for the interconnected nature of digital marketing adoption factors, consumer impact, destination competitiveness, and agri-farm development. The results confirmed that Factors served as foundational enablers, Impact acted as a mediating mechanism, Competitiveness functioned as a strategic outcome and Agri-farm development represented the long-term structural result These findings were fully consistent with the reviewed literature and reinforced the proposed conceptual framework, which posited that improving digital marketing adoption factors enhanced consumer impact, strengthened competitiveness, and ultimately supported sustainable agri-farm tourism development.

Proposed Agri-Farm Tourism Framework

The Proposed Agri-farm Tourism Framework interrelates different variables. The variables included are factors, impact, competitiveness, and Agri-farm development. Thus, figure 1, shows the circular relationship between these variables. The Factors influencing the adoption of digital marketing in receiving Agri-farm tourism-related advertisements such as usefulness, technology-self efficiency, and two-way communication can impact the competitiveness of digital marketing farm tourism sites on customers' purchase intentions such as informativeness, performance expectancy, and habit. At the same time, efforts to develop Agri-farm tourism in the community to promote a thriving local economy and income generation can have a positive impact on the environment, the economy, and society, which can in turn improve the level of competitiveness of Agri-farm tourism sites in terms of demand condition, situational resources and create resources n support further development of the sector. Therefore, as each variable increases, it can have a positive impact on the others, creating a strong and interconnected system that supports sustainable and inclusive agricultural growth.

The factor influencing the adoption of digital marketing in Agri-farm tourism-related advertisements has the yellow color, this color represents positivity, warmth, and happiness. The adoption of digital marketing in Agri-farm tourism is to focus on the positive outcomes that it can bring. Just as the color yellow is associated with optimism and confidence, digital marketing can help Agri-farm tourism sites to reach new audiences, build their brand, and create positive experiences for visitors. By embracing the positive aspects of digital marketing and the potential benefits it can bring, Agri-farm tourism may be more likely to adopt these strategies and succeed in the competitive tourism industry. The impact of digital marketing of Agri-farm tourism on customers' purchase intention has a color yellow-green. This color is often associated with growth, harmony, and balance. In the context of Agri-farm tourism and digital marketing, this color can represent the harmonious balance that can be achieved between promoting sustainable Agri-farm tourism practices and attracting customers through effective digital marketing strategies.

The Agri-farm tourism development in the community has a color blue-green, this color is often associated with calmness, balance, and harmony. In the context of Agri-farm tourism development in the community, this color can represent the importance of balance and harmony between economic development and environmental sustainability. Furthermore, Agri-farm development can have a significant impact on the community, both in terms of economic growth and environmental impact. By promoting sustainable Agri-farm tourism practices and balancing economic growth with environmental sustainability, Agri-farm development can contribute to the overall well-being of the community.

The competitiveness of Agri-farm has a color light blue, a color that is often associated with calmness, tranquility, and clarity. In the context of Agri-farm sites and their level of competitiveness, the color light blue represents the importance of clear communication and transparency in attracting and retaining customers. In a highly competitive market, Agri-farm tourism sites need to clearly communicate their unique value proposition and the benefits they offer to customers. The relationship between the factors influencing the adoption of digital marketing in receiving Agri-farm tourism-related advertisements and the impact of digital marketing of Agri-farm tourism sites on customers' purchase intentions is that the former predicts the latter. In other words, the factors that lead to the adoption of digital marketing in receiving Agri-farm tourism-related advertisements have a direct impact on customers' purchase intentions.

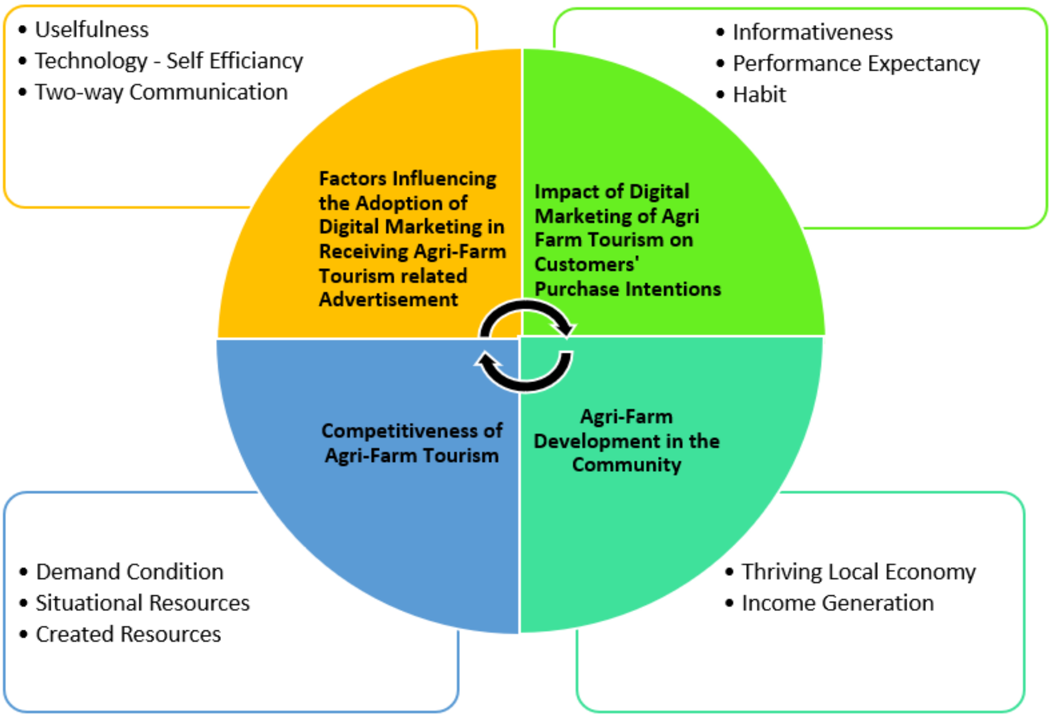

Figure 1. Proposed Agri-Farm Tourism Framework

The adoption of digital marketing refers to the extent to which Agri-farm tourism businesses use digital marketing strategies to promote their products and services. It is important because digital marketing can help businesses reach a wider audience, improve customer engagement, and increase sales. The indicators of adoption of digital marketing that are particularly relevant are the Use of social media platforms which refers to the extent to which businesses use social media platforms such as Facebook, Instagram, and Twitter to promote their products and services. Email marketing is used to communicate with customers and promote products and services. While, Website optimization, refers to the process of improving a website's visibility and ranking on search engines such as Google. According to Abad and Borbon (2019) the adoption of digital marketing had a significant impact on customers' purchase intentions in the Agri-farm tourism industry. Chen et al. (2020), mentioned that the use of social media and email marketing had a significant impact on customers' purchase intentions.

Customer engagement refers to the extent to which customers interact with and participate in the activities and experiences offered by Agri-farm tourism businesses. It is important because customer engagement can help businesses build relationships with customers, improve customer satisfaction, and increase repeat business. The indicators of customer engagement that are particularly relevant are participation in on-site activities which refers to the extent to which customers participate in the activities and experiences offered by Agri-farm tourism businesses. Online engagement refers to the extent to which customers engage with Agri-farm tourism businesses through online channels such as social media and email. Customer feedback refers to the extent to which businesses collect and respond to customer feedback. Furthermore, Brand Image refers to the overall perception and reputation of a business in the minds of customers. It is important because a positive brand image can improve customer loyalty, increase trust, and attract new customers. Indicators of brand image that are particularly relevant is perceived quality, Which refers to the perceived quality of the products and services offered by Agri-farm tourism businesses. Brand reputation refers to the reputation and image of the brand in the minds of customers. This brand personality refers to the personality and values associated with the brand.

As mentioned by Chen and Chen. (2018), the brand image had a significant impact on customers' purchase intentions in the Agri-farm tourism industry. Li et al. (2019) cited that perceived quality had a significant impact on customers' purchase intentions. brand personality had a significant impact on customers' purchase intentions. Competitive enterprises were more likely to invest in innovation, technology, and infrastructure, leading to increased productivity and profitability. Therefore, it can be inferred that the level of competitiveness of Agri-farm tourism Sites is likely to have a positive impact on Agri-farm Tourism Development. Moreover, Yildiz (2025), mentioned there is a positive correlation between competitiveness and rural development, suggesting that competitive agricultural enterprises were more likely to contribute to the economic development of rural areas.

Furthermore, there are the top two indicators that highlight the relevance of the competitiveness of Agri-Farm Tourism, which are Market access and integration, Innovation, and technology adoption. According to Nwoke et al. (2019), access to markets is a critical factor influencing the competitiveness of small-scale farmers. Similarly, as mentioned by Asante-Addo et al. (2018) access to markets and market information was a key determinant of competitiveness among smallholder farmers. Thus, market access and integration play a significant role in determining the level of competitiveness of Agri-Farm Tourism Sites. Moreover, Innovation and technological adoption this is an important indicator of the competitiveness of Agri-Farm Tourism. As cited by Anggraini et al. (2019), technology adoption was a critical factor influencing the competitiveness of rice farmers. Therefore the level of competitiveness of Agri-Farm Tourism sites is closely linked to their ability to adapt and utilize innovative technologies. Moreover, for Agri-Farm Tourism Development, the top two indicators that highlight the relevance of Agri-Farm Tourism Development are Sustainable agricultural practices, Financial investment, and support. Sustainable agricultural practices are essential for the long-term development of Agri-Farm Tourism sites. As mentioned by Ismail et al. (2018), the adoption of sustainable practices, such as integrated pest management and organic farming, had a positive impact on the development of small-scale farms. Similarly, Chen et al. (2020) also mentioned that the adoption of sustainable practices, such as conservation tillage and crop rotation, improved the productivity and sustainability of small-scale farms. Furthermore, the development of Agri-Farm Tourism is closely linked to the adoption of sustainable agricultural practices.

Financial investment and support are also critical for the development of Agri-Farm Tourism. Financial investment and support play a critical role in promoting the development of Agri-Farm Tourism sites. Overall, these suggest that the level of competitiveness of Agri-Farm Tourism sites and the development of Agri-Farm Tourism sites are closely linked to factors such as market access, innovation and technology adoption, sustainable agricultural practices, and financial investment and support.

The Agri-farm tourism framework can have practical implications for the hotel industry in several ways. First, it can help hotels identify and capitalize on opportunities for collaboration with local Agri-farms. By partnering with Agri-farms, hotels can provide guests with unique experiences that showcase the local agriculture and food culture. This can differentiate hotels from their competitors and enhance their attractiveness to potential customers. Second, the framework can help hotels to assess the competitiveness of the Agri-farms they partner with. By evaluating the factors that contribute to competitiveness, hotels can select Agri-farms that are likely to provide high-quality products and services. This can help to ensure customer satisfaction and loyalty. Third, the framework can help hotels to evaluate the impact of their partnership with Agri-farms on the local community and environment. By considering factors such as sustainability and social responsibility, hotels can ensure that their partnership with Agri-farms is aligned with their values and supports the well-being of the local community.

To apply the Agri-farm tourism framework, farm sites can start by evaluating their current level of competitiveness. This can involve assessing factors such as the quality of their products and services, the efficiency of their operations, and their marketing and branding strategies. Based on this evaluation, farm sites can identify areas where they can improve their competitiveness. Finally, Agri-farms can use the framework to develop a plan for Agri-farm tourism development that is aligned with their goals and values. This can involve identifying opportunities for collaboration with hotels, developing marketing and branding strategies that highlight their unique offerings, and implementing sustainable and socially responsible production practices. By applying the Agri-farm tourism site framework, farm sites can enhance their competitiveness and contribute to the growth of the local tourism industry. Overall, the assessment suggests that there is a positive relationship between the competitiveness of Agri-Farm and Agri-Farm Development, as competitive enterprises are more likely to invest in innovation, contribute to rural development, and adopt sustainable practices.

4. Conclusions

Based on the Proposed Agri-farm Tourism Framework in Central Luzon Region, it can be concluded that this framework has the potential to enhance the economic development of the region.

- The majority of the respondents are female 18 to 25 yrs. old, college, and university graduates, with an annual income of fewer than 50 thousand pesos, with a full-time job. This may imply that by understanding the demographic characteristics of the target audience, Agri-farm tourism operators in Central Luzon Region can tailor their marketing strategies, pricing, and experiences to better meet the needs and expectations of their tourists.

- The study found that the adoption of digital marketing is a powerful tool for promoting Agri-farm tourism and can enhance the tourists' travel experience. Digital marketing for Agri-farm tourism can help to increase their visibility, engagement, and revenue, while also improving the overall customer experience. By leveraging the latest digital marketing tools and strategies, Agri-farm tourism operators can connect with a wider audience, create personalized marketing messages, and build lasting relationships with their customers.

- The impact of digital marketing of Agri-farm tourism in Central Luzon Province can significantly influence customers' purchase intentions by creating high-performance expectations, appealing to hedonic motivation, creating habits, providing interactivity and informativeness, and increasing perceived relevance. By leveraging the latest digital marketing tools and strategies, Agri-farm tourism can connect with a wider audience, build lasting relationships with their customers, and increase their revenue and profitability.

- The Competitiveness of Agri- FarmTourism in Central Luzon is dependent on a variety of factors that can impact the perceived value and attractiveness of the site. By focusing on creating and improving resources, support resources, situational conditions, demand conditions, and destination management, farm-tourism sites can enhance their competitiveness and attract more tourists/visitors. Conditions, and Destination Management as perceived by the tourists/visitors.

- The perceived Agri-Farm Tourism Development in Central Luzon Region they have significant implications for the local community and economy, including learning and educational activity improvements, cultural development, community participation, a thriving local economy, and income generation. By developing Agri-farm tourism, operators can attract more visitors, promote cultural understanding and appreciation, foster community engagement, create jobs and business opportunities, and provide an additional source of income for farmers.

- There is a significant difference in the responses when grouped according to profile. Demographic characteristics of the tourists can play a crucial role in shaping their perceptions and attitudes towards Agri-farm tourism. This implies that Agri-farm tourism operators consider the differences in profiles when developing marketing strategies and designing experiences to better meet the needs and expectations of their target audience. By tailoring their offerings to different demographic profiles, Agri-farm tourism operators can better appeal to a wider range of visitors and enhance their overall experience, leading to increased customer satisfaction and loyalty.

- There is a significant relationship between the 4 variables. The relationship between these variables implies that digital marketing strategies may play an important role in the development and competitiveness of the Agri-farm tourism industry in the Central Luzon Province. By adopting effective digital marketing strategies, Agri-farm tourism could attract more visitors, generate more revenue, and contribute to the overall growth and development of the sector.

- Proposed an Agri-Farm Tourism Framework. The Proposed Agri-Farm Tourism Framework could have significant implications for the Central Luzon Province, particularly for the Agri-farm tourism sector. If successfully implemented, the framework could lead to improved tourism experiences, economic growth, environmental sustainability, community development, and improved regional governance and coordination.

Recommendation - Based on the findings and conclusion, the researcher recommended the following:

- F or the Department of Tourism, Promote Agri-farm tourism in Central Luzon domestically and internationally, by highlighting the region's unique agricultural heritage and creating opportunities for visitors to experience its firsthand while supporting the local economy.

- For Agri-farm Owners and Operators, Develop unique and engaging farm experiences for tourists, such as farm tours, cooking classes, and farm-to-table meals to become competitive. Maintain high standards of safety and hygiene on their farms to ensure that visitors are comfortable and protected. Also, incorporate sustainable farming practices to demonstrate their commitment to the environment and embrace technology in marketing efforts.

- For the Agri-farm Managers, Develop Agri-farm tourism packages artistically with the application of technology to attract both local and foreign tourists. Consider diversifying crops and products to attract more visitors and increase revenue streams. Lastly, offer educational tours and workshops to teach visitors about farming and agriculture.

- For the Local government of Central Luzon, Provide Infrastructure, and facility funding to support Agri-farm tourism development. It is also important to ensure that the roads leading to Agri-farm Tourism are well-maintained and easily accessible. Work with the Department of Tourism to develop policies and guidelines to regulate and monitor Agri-farm tourism activities. Finally, encourage and support farmers to adopt sustainable farming practices.

- For the Tourists, Respect Agri-farm tourism, and their resources by following the rules and regulations set by the fam operators. Engage in the farm activities offered and learn about local agriculture and culture.

- For the Local Community, Promote the local culture and traditions to the tourists, and showcase the unique features of Agri-farm tourism. Provide support to the Agri-farm tourism operators and managers through the provision of local products, services, and labor. Participate in sustainable farming practices that would help preserve the natural resources of the area.

- For Future Researchers, Conduct research on the impact of Agri-farm tourism on the local economy, environment, and social well-being. Identify best practices and strategies for the development and management of sustainable Agri-farm tourism. Recommend policies and programs that would support the growth and sustainability of the Agri-farm tourism industry

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Digital advertising and purchase intention of a mobile phone brand

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Abstract

In recent years, digital advertising has undergone significant changes, especially in the mobile phone industry, which has greatly influenced consumers' purchasing behavior. This study explores the impact of digital advertising on consumers' purchase intention toward Huawei smartphone brands. With the gradual increase in the frequency of digital advertising for mobile phone brands, consumers' purchase intention toward Huawei smartphones has become more easily influenced by digital advertising. Digital advertising delivers information and shapes brand images through various platforms while interacting with consumers. This study aims to evaluate the impact of digital advertising on consumers' purchase intention toward Huawei smartphone brands. Through reviewing and analyzing the relevant literature, a questionnaire was first designed using a four-point Likert scale. The sample was selected using a probability sampling method, which ensures that each collected sample has an equal chance of being selected. A total of 385 valid questionnaires were collected. Second, reliability and validity tests were conducted on the sample data to ensure the reliability and validity of the data. Finally, the influencing factors of digital advertising on consumers' purchase intention toward mobile phone brands were examined. The findings show that factors of digital advertising, such as smart ad placement, messaging, and branding, have statistically significant correlations with product features, brand image, product price, and social influence in the process of forming purchase intention. Based on the results, this study proposes relevant recommendations for mobile phone brands to enhance consumers' purchase intention through digital advertising.

Keywords: digital advertising, purchase intention, Huawei smartphones, brand image, social influence

Digital advertising and purchase intention of a mobile phone brand

1. Introduction

The rapid development of internet technology in the new era, mobile communications (especially 5G), and big data analytics, the global business environment is undergoing profound changes. Traditional marketing methods that rely on TV, newspapers and outdoor advertising are gradually weakening, and consumer attention has shifted to online on a large scale, and social media, search engines, short video platforms and e-commerce platforms have become the main channels for brands to gain user attention (Bauerová & Kopřivová, 2025; Krishen et al., 2021). In this context, digital advertising has gradually evolved into a core component of corporate marketing strategies. However, the degree of "exposure" of advertising is not the same as the degree of "effectiveness", and what companies really care about is whether digital advertising can effectively influence consumer perception and further translate it into actual purchase intent (Ghose & Todri-Adamopoulos, 2016; Stewart et al., 2018).

This problem is particularly typical in the smartphone industry. At present, the competition in the mobile phone market is fierce, and the trend of homogenization of products in function and appearance is obvious, and consumers face more uncertainty in the process of brand selection. Therefore, enterprises need to not only rely on the technical advantages of the product itself, but also strengthen brand awareness and highlight differentiation through digital advertising, thereby influencing consumer decision-making. In other words, digital advertising has become a key bridge connecting "brand information" and "consumer purchase intention", and its mechanism is worthy of in-depth discussion. Therefore, exploring the relationship between digital advertising and consumer purchase intention is highly theoretical and practically relevant.

Among the many mobile phone brands, Huawei has outstanding research value. First, from the perspective of market performance, Huawei has long ranked among the top three smartphone shipments in the world and has maintained a leading position in the Chinese market, with a high brand recognition and user base. Although its global market share has fluctuated in recent years due to changes in the external environment and supply chain constraints, Huawei still maintains strong competitiveness in the domestic market and high-end market through continuous technological innovation (such as imaging technology, chip research and development, and HarmonyOS operating system) and brand strategy adjustment (Tse et al., 2024; Zeng & Yao-zhong, 2023). Secondly, from the perspective of development path, Huawei has experienced a process from rapid growth to limited adjustment to gradual recovery, which makes it typical and representative in brand communication and marketing strategies.

It is even more important to note that in the current environment, digital advertising is not only a tool for Huawei product promotion but also an important means of brand reshaping. Through digital advertising, Huawei not only conveys product function information, but also continuously strengthens its brand image of "leading technology" and "independent innovation", thereby influencing consumers' perception of the value of its products (Li & Galanza, 2024; Wang et al., 2022). This transmission path from "advertising information-consumer cognition-purchase intention" is the core issue of this study. Choosing Huawei as the research object not only helps to deeply understand how enterprises can achieve brand breakthroughs through digital advertising in a complex market environment, but also provides valuable experience for other mobile phone brands (such as Xiaomi, OPPO, VIVO, etc.). At the same time, this study is also of certain significance for enriching the theoretical research in the field of digital marketing and consumer behavior, especially in the context of high-tech products and high-engagement decision-making, and the discussion of the mechanism of digital advertising has practical value.

The study aimed to analyze the characteristics of digital advertising employed by mobile phone brands and its relationship with consumers' purchase intentions. Furthermore, it sought to examine, from the perspective of consumer cognition, the mechanisms through which digital advertising influenced product features, brand image, price perception, and social influence in the formation of purchase intentions. Lastly, the study aimed to provide decision-making references for brands to optimize their digital marketing strategies. Specifically, the study evaluated and analyzed the performance of digital advertising of mobile phone brands across three dimensions: smart ad placement, messaging, and branding. It also assessed consumers' purchase intentions in terms of product features, brand image, price, and social influence. In addition, the study examined the significant relationship between the effectiveness of digital advertising and consumers' purchase intentions. Finally, based on the survey results, a digital advertising plan was proposed.

2. Methods

Research Design - This study employed a quantitative research design to examine digital advertising and its impact on consumers' purchase intentions. The study used a descriptive-correlational research design. The descriptive component aimed to depict the current practices of smartphone brands in the field of digital advertising and the characteristics of consumer responses. Meanwhile, the correlational component measured the strength and direction of the relationships among the different dimensions of digital advertising and purchase intention. Through this research design, the study described the current market environment and analyzed the statistical relationships between digital advertising strategies and consumer behavior.

Participants of the Study - This study selected 385 Huawei smartphone users from various regions across China as participants to ensure sample breadth and representativeness. Participants were primarily recruited through online survey platforms and social media platforms such as WeChat, Weibo, and TikTok. To ensure sample randomness, we employed a combination of random sampling and stratified sampling methods.

Research Instrument - The main research tool of this study was a structured questionnaire, which was designed based on the conceptual framework of the study and the main variables “Digital Advertising” and “Purchase Intention”. The questionnaire content is compiled around the main dimensions of each variable, aiming to systematically measure the effectiveness of digital advertising in mobile phone brand marketing and the influencing factors of consumer purchase intention. The questionnaire is divided into two parts. The first part is “Digital Advertising”, which includes smart ad placement, messaging, and branding. The second part is “Purchase Intention”, which includes product features, brand image, product price and social influence. To ensure the content validity of the research tool, the first draft of the questionnaire will be submitted to three experts with professional backgrounds in business administration and marketing for review and revision. The focus of expert review includes the clarity of question formulation, the relevance of content and the scientific design of the scale. The revised questionnaire was pilot tested with a sample size of 30 people to test the reliability of the questionnaire. Internal consistency is assessed by calculating Cronbach's alpha coefficient, where α values of 0.70 or above are considered acceptable for reliability.

Table 1
Reliability Test Result

Variables	Cronbach Alpha	Number of Items	Interpretation
Digital Advertising			
Smart Add Placement	0.900	5	Excellent
Messaging	0.874	5	Good
Branding	0.848	5	Good
Purchase Intention			
Product Features	0.877	5	Good
Brand Image	0.914	5	Excellent
Product Price	0.876	5	Good
Social Influence	0.906	5	Excellent

Data Gathering Procedure - After identifying the respondents, the official collection of data began. The target audience for data collection and interviews consisted of Chinese consumers of smartphone brands, including individuals who currently used or had previously used mobile phone brands. The purpose of this study was to examine the correlation between digital advertising and consumer purchase intentions. Respondents with a certain degree of consumer experience and knowledge of mobile brand marketing activities were selected to obtain more representative and empirical data. The study used purposive sampling, focusing on consumers who used smartphones and had purchase experience as the sample group. This method ensured that respondents could make accurate judgments and effectively respond to inquiries about digital advertising, brand image, and product functions. The questionnaire was primarily distributed through online surveys. The investigators used online platforms such as WeChat, Questionnaire Star, email, and mainstream social media channels to distribute questionnaire links to potential respondents to increase the response rate and expand sample coverage. This method not only effectively saved time and costs but also ensured anonymity and data confidentiality while improving the enthusiasm and authenticity of respondents' answers. In addition, for some interviewees who could be reached, such as smartphone users in the researchers' workplaces or partner universities, paper questionnaires were distributed offline to ensure the diversity of data sources and the appropriateness of the sample distribution.

Data Analysis - The collected data were statistically analyzed using SPSS. The study employed descriptive statistics, particularly the mean, standard deviation, and frequency distributions, to summarize respondents' responses across the dimensions of digital advertising (intelligent advertising, messaging, and branding) as well as purchase intent (product features, brand image, product price, and social impact). Correlation analysis used the Pearson correlation coefficient to examine the strength and direction of the relationship between each dimension of digital advertising and each dimension of purchase intent.

Ethical Considerations - Ethical considerations were observed in the conduct of the research to ensure that all information gathered was used solely for research purposes and to maintain the quality and integrity of the study. The researchers obtained ethical approval from the LPU Office of Research Ethics. The confidentiality and anonymity of the respondents were also ensured by not collecting their names while they were answering the questionnaires. The researchers ensured that the respondents participated voluntarily and answered the questionnaires according to their own free will. Lastly, the researchers ensured that none of the respondents were hurt or harmed during the study and that their safety and security remained a top priority.

3. Result and discussion

Table 2

Summary Table of the Respondents' Level of Effectiveness of Digital Advertising

Dimensions	Composite Mean	VI	Rank
Smart Ad Placement	2.52	Agree	1
Messaging	2.50	Agree	3
Branding	2.51	Agree	2
Overall Composite Mean	2.51	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 provides a comprehensive overview of the three-dimensional data of digital advertising. The overall comprehensive average is 2.51, which is classified as “agree”. The focus is on the strategic positioning of promotional content. Brand development and information transmission are not very important. These findings show that digital advertising is relatively effective at the technical level, that is, in terms of advertising. The fact that users noticed these advertisements on the platforms they often use proves this. This view is consistent with the findings of Liu et al. (2022), who emphasize the key role of digital marketing communication in attracting consumers' attention and promoting initial connections with the audience. Regarding the dimensions that received moderate scores, branding reached a weighted mean of 2.51, while messaging followed closely with a mean of 2.50; notably, both metrics fall within the “Agree” classification. However, the content and communication aspects remain comparatively weaker. Messaging shows the lowest composite mean, highlighting that while the ads may be visually engaging, they do not sufficiently convey clear product information or deep brand values. This imbalance between delivery efficiency and content quality helps explain why overall effectiveness is moderate rather than strong. As noted by Cheng and Zhang (2022), digital advertising must move beyond traditional information cognition to a deeper logic of content cognition to truly provide value and influence the consumer's decision-making process.

Table 3

Summary Table of the Respondents' Level of Purchase Intentions

Dimensions	Composite Mean	VI	Rank
Product Features	2.50	Agree	2
Brand Image	2.49	Disagree	3
Product Price	2.46	Disagree	4
Social Influence	2.52	Agree	1
Overall Composite Mean	2.49	Disagree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

As shown in Table 3, a comprehensive summary of the dimensions affecting consumers' purchase intention is provided. The total compound average is 2.49, which is interpreted as "disagree". The value obtained by the weighted average calculation result is 2.52 (agree), which shows that social impact is the dimension of obtaining the highest ranking. This finding shows that external factors, such as the influence of age and social recognition, currently have a more significant impact on respondents' purchase decisions than internal factors (including price fairness and brand awareness). As Lin, et al. (2022) observed, the attitude towards advertising on Chinese social media is widely influenced by these external social symbols, which are often proven to be more convincing than traditional product indicators. The weighted average of product characteristics is determined to be 2.50 (agree), while the brand image is found to be 2.49 (disagree). However, product price ranked the lowest with a weighted mean of 2.46, interpreted as "Disagree". The data suggests that overall purchase intention is moderate but leans toward the negative, reflecting a general lack of strong motivation to finalize a purchase. This finding aligns with the research by Liu, et al. (2022), who emphasize that digital marketing communication must effectively capture consumer attention across multiple dimensions to overcome such inertia. The lower rankings for brand image and product price suggest that these areas specifically require strategic improvement. Ultimately, while the brand maintains some technical appeal, it has yet to convert this into a cohesive value proposition that consistently motivates consumers to buy.

Table 4

Relationship Between the Effectiveness of Digital Advertising and the Purchase Intention of Consumers

Smart Ad Placement	rho-value	p-value	Interpretation
Product Features	0.680**	< 0.001	Significant
Brand Image	0.652**	< 0.001	Significant
Product Price	0.630**	< 0.001	Significant
Social Influence	0.532**	< 0.001	Significant
Messaging			
Product Features	0.661**	< 0.001	Significant
Brand Image	0.679**	< 0.001	Significant
Product Price	0.648**	< 0.001	Significant
Social Influence	0.632**	< 0.001	Significant
Branding			
Product Features	0.650**	< 0.001	Significant
Brand Image	0.662**	< 0.001	Significant
Product Price	0.654**	< 0.001	Significant
Social Influence	0.631**	< 0.001	Significant

**Correlation is significant at the 0.01 level

Table 4 clarifies the correlation between the effectiveness of digital advertising and the purchase intention. Given that all the p values calculated in the table are less than 0.001, it can be determined that the relationship between the variables is statistically significant. In all dimensions, the correlation coefficient indicating positive correlation is found to be moderate to intensity, indicating that there is a positive correlation between the increase in digital advertising and the increase in purchase intention. These results are consistent with the assertions put forward by Liu, et al. (2022). They believe that strategic digital marketing communication is crucial to attracting consumers' attention and improving the overall effectiveness of advertising. From a practical standpoint, this means that digital advertising is not merely a tool for visibility but plays a meaningful role in influencing consumer decisions. However, the strength of these relationships varies across dimensions, reinforcing the observation that while advertising is effective overall, its impact is uneven. As noted by Cheng and Zhang (2022), the value and influence of digital advertising depend heavily on moving beyond traditional information delivery to a deeper logic of content cognition. This variability emphasizes that while technical placement is important, the resonance of the brand message and image remains critical for translating exposure into a final purchase decision.

Table 5
Proposed Action Plan for the Digital Advertising Strategy and Purchase Intention of Huawei Mobile Phones

Key Result Area Objectives	Strategies	Persons Involved Expected Outcome
Messaging To improve message clarity and information quality regarding product features.	Information-Rich Content Strategy: Develop “Feature Spotlights” that use high-clarity infographics and short-form videos explaining technical specs (e.g., chip performance). Add content display of “daily usage scenarios”, such as battery life, photography, games and office real usage scenarios, to help consumers understand how product functions meet the needs of real life. Optimize the structure of advertising information, transform complex technical parameters into more intuitive and understandable expressions, and reduce the situation where consumers “see advertisements but cannot truly understand the value of products”.	Marketing Manager, Content Creators, Product Specialists Significant increase in consumer understanding of product features; transition from “Disagree” to “Agree” in future surveys.
Product Price To align price perception with perceived product value and competitive positioning.	Value-Based Communication: Launch a “Value Justification” campaign highlighting premium components (Kirin chips/imaging) to justify high-end pricing. Strategic Promotions: Use targeted promotional offers to mitigate negative price sensitivity. Strengthen the correlation between product core performance and price in advertisements, highlight the advantages of chip performance, imaging system and durability, and enhance consumers' awareness of “value for money”. Combined with student discounts, installment payments and limited-time giveaways, reduce consumer sensitivity to price and enhance product competitive attractiveness.	Store Manager, Pricing Analysts, Digital Marketing Team Shift in perception from “unreasonable price” to “premium/worth it” value proposition; improved competitive standing.

4. Conclusions

Specifically, this study aimed to evaluate and analyze the performance of digital advertising of mobile phone brands across three dimensions: smart ad placement, messaging, and branding. It also aimed to examine consumer purchase intention in terms of product features, brand image, product price, and social influence. In addition, the study sought to determine the significant relationship between digital advertising effectiveness and consumers' purchase intentions. Finally, based on the survey results, a digital advertising plan was proposed.

- Smart ad placement was the most effective dimension of digital advertising, indicating strong visibility and alignment with user behavior.
- Product features, brand image, product price, and social influence were identified as factors influencing purchase intention rather than direct measures of purchase intention.
- Digital advertising effectiveness significantly influenced consumers' purchase intentions.
- An action plan was proposed to improve the digital advertising effectiveness and purchase intentions of Huawei mobile phone customers.

Recommendations - It is recommended that the digital marketing team of mobile phone brands further optimize the frequency and push rhythm of advertisements on the basis of maintaining high advertising exposure and accurate delivery advantages to avoid consumer disgust caused by repeated exposure. At the same time, the advertising can be dynamically adjusted based on users' browsing time, interests and preferences and platform usage habits to improve consumers' acceptance of advertising content and overall advertising effect. It is recommended that mobile brand management and digital marketing teams should not only focus on a single advertising exposure effect, but should comprehensively optimize from multiple influencing factors such as product characteristics, brand image, product price, and social impact. Especially in terms of brand value shaping and price perception, consumers' understanding of the overall value of products should be strengthened through more real, clear and close to consumer needs through digital advertising content. At the same time, it can be combined with social media interaction, user reviews and word-of-mouth communication to further enhance consumers' trust and purchase motivation for the brand, so as to gradually convert existing product interest into actual purchase intention.

It is recommended that the digital marketing team of mobile phone brands further improve the overall quality and communication consistency of digital advertising, especially in terms of advertising content, brand presentation and accurate delivery. Since the research results show that the effect of digital advertising will significantly affect consumer cognition, enterprises should pay more attention to consumers' understanding and feelings of advertising information, and enhance consumers' positive perception of product value, brand image and product advantages through content design that is closer to user needs and more authentic brand expression, so as to increase the possibility of subsequent purchases. The marketing management team of the mobile phone brand may adopt the Proposed Action Plan, this structured approach will help balance technical ad placement with high-quality content, ensuring that digital exposure effectively translates into a stronger, consistent desire to purchase. Future researchers may consider longitudinal shifts in digital advertising as technology evolves, additionally, expanding the scope to compare different smartphone brands or measuring actual sales data instead of just intention would provide a more complete picture of marketing conversion.

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Impact of consumer trust on purchase intention in e-commerce platforms

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Abstract

This study examined the impact of consumer trust on consumer purchase intention in e commerce platforms, focusing on trust dimensions of reliability, security, and credibility, and purchase intention dimensions of attitudinal intention, behavioral intention, and purchase decision confidence. Using a descriptive-correlational research design, data were gathered from online consumers and analyzed through weighted means and Spearman's rho correlation to assess both the levels of and relationships among the variables. The findings revealed that consumers demonstrated an agreeable level of trust and purchase intention, with security and credibility emerging as the strongest trust dimensions and attitudinal intention as the most dominant dimension of purchase intention. Moreover, the results showed strong and highly significant positive relationships among all trust dimensions and all purchase intention dimensions, indicating that higher consumer trust substantially enhances consumers' willingness to purchase and their confidence in purchase decisions. Based on these findings, a targeted action plan was proposed to strengthen trust related features of e commerce platforms. The study underscores the critical role of trust in shaping online consumer behavior and provides practical insights for e commerce platform managers seeking to enhance consumer engagement and purchasing outcomes.

Keywords: consumer trust, purchase intention, e-commerce platforms, reliability, security, credibility, online shopping, consumer behavior

Impact of consumer trust on purchase intention in e-commerce platforms

1. Introduction

In the sprawling marketplace of clicks, carts, and instant confirmations, trust functions like the invisible handshake between strangers. It turns curiosity into consideration, then consideration into commitment. When a shopper cannot touch a product or look a seller in the eye, they lean on signals; design polish, transparent policies, consistent reviews, responsive support that together whisper, “this place will treat you fairly.” In this sense, purchase intention is not simply a calculation of price and features; it is a narrative about reliability that unfolds across the interface. The stronger and more coherent the story, the more willing the consumer becomes to move from browsing to buying. Because platforms orchestrate the entire journey from search to payment to post-purchase resolution, their ability to stage trust at each moment often determines whether desire becomes decision.

The scholarly consensus has grown clear: trust is a primary engine of online purchase intention, and it exerts this influence across both first-time and repeat transactions, regardless of whether the trust object is the website, the retailer, or the seller (Bulsara & Vaghela, 2023; Ghosh, 2024). Meta-analytic syntheses map the determinants of online buying further position trust among core antecedents, alongside perceived usefulness, ease of use, security, and e-WOM, revealing a pattern where confidence in the platform’s competence and integrity accelerates movement from attitude to intention (Ghosh, 2024; Wang et al., 2022). In social commerce settings, trust in sellers and community forums emerges as especially potent, underscoring the role of social proof and peer signaling in resolving uncertainty before purchase (Wang et al., 2022).

Path models and cross-market studies unpack how trust is formed and why it matters. Reputation, perceived security, and website quality reliably build trust, and trust in turn heightens purchase intention while suppressing perceived risk (Quintus et al., 2024). In cross-border contexts, information quality, system reliability, and service responsiveness are critical levers; they shape trust and thereby purchase intention, with trust mediating the effects of platform quality on buying intent (Buntu Laulita, 2024). The story complicates in livestream and mobile environments: ongoing trust sustained by expectation confirmation and real-time social interaction predicts continued purchase intention, and trust can even transfer from the e-store to streaming channels as shoppers carry beliefs about integrity and predictability across formats (Ko & Ho, 2024; Duong et al., 2025/2024).

Perceived risk operates as trust’s counterfactual when data privacy feels fragile, product authenticity uncertain, or redress mechanisms opaque, and intention falters. Empirical work shows trust mediating the influence of service quality, design quality, and reputation on purchase intention, while perceived risk moderates the trust-intention path and can weaken it when left unaddressed (Qalati et al., 2020). Regional evidence corroborates that perceived risk depresses intention and trust, with trust partially offsetting the damage through reassurance effects (Pang & Ismail, 2022). Cross-platform behavior reveals the economic stakes: low platform trust and negative reports push consumers to compare, migrate, and complete purchases elsewhere, fracturing conversions and eroding loyalty (Zhang & Yu, 2020).

The pandemic accelerated digital migration and elevated trust from a “nice-to-have” to a survival strategy. Studies in COVID-19 and post-COVID contexts identify attitudes, satisfaction, and system assurance especially privacy and security as foundational to trust and online buying decisions (El Moussaoui & Benbba, 2023; Dang et al., 2023). New cohorts of e-commerce users formed repurchase habits that are highly sensitive to platform reliability and brand experience (Ding et al., 2022). At the sector level, public guidance emphasizes that continued growth in online retail depends on robust trust architectures; fraud safeguards, transparent policies, and dependable service, because a single security lapse can undo years of brand equity (International Trade Administration, 2024).

Despite the growing body of research on trust and purchase intention, critical blind spots remain. Most existing studies treat trust as a single, uniform concept, overlooking its multi-dimensional nature, such as cognitive trust rooted in competence and predictability, and affective trust grounded in benevolence and care. This simplification fails to capture how trust operates across increasingly complex consumer journeys that span websites, mobile apps, social commerce, and live-streaming platforms. Furthermore, current models rarely explore how trust interacts with perceived risk under different cultural and institutional conditions, leaving unanswered questions about whether trust mechanisms behave consistently across markets and regulatory environments. Equally concerning is the lack of integration of emerging technological trust signals, such as AI-driven authentication, blockchain transparency, and biometric security, into behavioral models of purchase intention. These gaps limit both theoretical advancement and practical guidance for platforms seeking to build trust in a rapidly evolving digital ecosystem.

This study is driven by the urgent need to address these gaps and provide a comprehensive understanding of how trust shapes consumer behavior in e-commerce. By developing an integrative framework that captures the multi-dimensional nature of trust, examines its interaction with perceived risk, and incorporates institutional and technological factors, this research aims to move beyond fragmented insights toward a holistic model of purchase intention. Such a framework will not only clarify the mechanisms through which trust influences consumer decisions but also identify the most effective levers for building and sustaining trust in diverse contexts, from traditional e-commerce to mobile and social commerce environments. Ultimately, this study seeks to empower platform managers with actionable strategies to convert trust into long-term customer loyalty, while offering scholars a robust foundation for future research in an era where trust is both a competitive advantage and a survival imperative.

This study aims to determine the impact of consumer trust on purchase intention in e-commerce platforms. Specifically, it sought to: Assess the level of consumer trust in terms of reliability, security, and credibility; determine the level of consumer purchase intention in terms of attitudinal intention, behavioral intention, and purchase decision confidence; test the significant relationship between consumer trust and consumer purchase intention and propose an action plan to enhance trust-related features of e-commerce platforms.

2. Methods

Research Design - This study employed a quantitative, cross-sectional correlational research design, which will be most appropriate for examining the statistical association between consumer trust and purchase intention as they naturally occur among e-commerce users, without any manipulation of variables. In current methodology literature, correlational research is defined as a non-experimental design used to measure whether two or more variables co-vary and to determine the strength and direction (positive, negative, or none) of their relationship in real-world settings (Sreekumar, 2024; Pubrica Research Academy, 2024).

Participants - The study involved 385 consumers who regularly engage in online shopping on major e-commerce platforms such as Shopee, Lazada, Amazon, Alibaba, JD, and Pinduoduo. These participants were selected through convenience sampling, allowing the researcher to reach active online shoppers who are easily accessible and willing to participate. To ensure that respondents are appropriate for the research objectives, only individuals who are 18 years old and above, have made at least one online purchase within the last three months, and have prior experience using at least one of the identified e-commerce platforms were included. Additionally, participants must be capable of understanding and completing the survey questionnaire in English. Conversely, the study excluded individuals who do not meet the minimum age requirement, those who have not purchased online within the specified timeframe, and those who do not use e-commerce platforms for personal shopping. Any respondents who submitted incomplete or inconsistent responses were excluded to maintain the accuracy and reliability of the dataset. Through these inclusion and exclusion parameters, the study ensured that the final sample accurately reflects active e-commerce users whose experiences are essential for assessing the relationship between consumer trust and purchase intention.

Data Gathering Instrument - This study used a self-administered survey questionnaire adapted from validated scales in recent, peer-reviewed studies on consumer trust and purchase intention in e-commerce contexts. Specifically, items for Consumer Trust were adapted from Singh, et al., (2024) multidimensional treatment of consumers' trusting beliefs toward e-commerce platforms (e.g., integrity, benevolence/care, competence/ability, and predictability); Alzaidi and Agag's (2022) work linking trust and privacy concerns in social media-enabled e-retail environments (to capture structural assurance signals such as privacy, security, and platform safeguards); and Florea et al., (2025) for digital integrity perspective, which informed indicators of honesty, transparency, and policy clarity as integrity-related facets of trust. For Purchase Intention, items were adapted from Asgari, Azimi et al., (2023), who operationalized continuance/intent to keep shopping online after the pandemic; Sung et al., (2023), whose findings on trust in product quality and review credibility informed confidence-laden intention judgments; and (c) Christiarini et al., (2024), who modeled intention in flash-sale settings with the mediating role of satisfaction and trust in e-commerce behavior. All items used a 4-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree) and were worded for clarity and relevance to the current e-commerce setting. The instrument was validated by three (3) content experts in the field (such as digital marketing/consumer behavior scholars), and following expert review undergone reliability test (such internal consistency via Cronbach's alpha and/or McDonald's omega) through a small pilot before the main data collection.

The reliability analysis indicates that the constructs related to consumer trust and purchase intention demonstrate high internal consistency. For consumer trust, the dimensions of reliability ($\alpha = 0.913$) and security ($\alpha = 0.930$) show excellent reliability, while credibility ($\alpha = 0.891$) reflects good reliability. The overall reliability for consumer trust reached 0.972, indicating excellent consistency among the items. Similarly, the constructs under purchase intention also demonstrate strong reliability. Attitudinal intention ($\alpha = 0.930$) and behavioral intention ($\alpha = 0.934$) both achieved excellent reliability, while purchase decision confidence ($\alpha = 0.890$) indicates good reliability. The overall alpha value of 0.974 further confirms excellent internal consistency. These results suggest that the instruments used to measure consumer trust and purchase intention are highly reliable and suitable for further statistical analysis.

Procedure - After the survey instrument had successfully passed the expert validation process and had demonstrated acceptable reliability during the pilot test, the formal data collection began. The final questionnaire was administered online through Google Forms, allowing participants to respond at their convenience using any internet-enabled device. Before proceeding to the survey, each participant was shown an informed consent form explaining the purpose of the study, the voluntary nature of participation, the estimated time required, as well as their right to withdraw at any point without penalty. Only participants who provided their explicit consent were allowed to continue with the questionnaire. Once responses were submitted, they were automatically recorded and stored securely within the Google Forms database. After the data collection period, all responses were screened, and only completed and valid entries were retained for subsequent analysis.

Data Analysis - The collected data was analyzed using SPSS 26.0. The analysis began with descriptive statistics, including the computation of means and standard deviations, to summarize participants' responses and to describe the distribution of scores for each dimension of consumer trust and purchase intention. Following this, a Pearson product-moment correlation was conducted to determine the strength and direction of the relationship between overall consumer trust and purchase intention among e-commerce users. Finally, a multiple regression analysis was performed to examine the predictive power of the dimensions of consumer trust, such as integrity, reliability, benevolence, predictability, and structural assurance, on purchase intention. The use of these statistical techniques allowed the study to determine both the relational and predictive links between the variables

Ethical Consideration - This study upheld the principles of respect for persons, beneficence, and justice by ensuring fully-informed, voluntary participation and by minimizing risk at every stage. Before accessing the questionnaire, potential participants viewed an informed consent page describing the study purpose, eligibility, estimated time, voluntary nature, the right to skip items or withdraw at any time without penalty, and any non-coercive incentive (if applicable). Only those who explicitly agreed can proceed. Eligibility (18+, recent online purchase, use of at least one target platform, ability to complete the survey in English) were applied consistently, and exclusions (under 18, no recent purchase, incomplete or inconsistent responses) were enforced to keep the sample appropriate and to protect data quality. To preserve anonymity and confidentiality, the survey avoided collecting direct identifiers or IP addresses and advised respondents not to include personal data in any open-text fields. Results were reported only in aggregate (e.g., means, percentages, models), ensuring that no individual can be identified.

To protect data, responses were gathered via a secured Google Forms settings, exported to password-protected files, and stored on an encrypted, access-restricted drive controlled by the researcher who has sole access. The dataset will be retained for the minimum period required by institutional policy (e.g., 3–5 years) and then securely deleted. Given the nature of brief attitudinal questions, the study presented minimal risk, limited to potential discomfort from survey items; participants may stop at any time. No deception were used, and no e-commerce platform (e.g., Shopee, Lazada, Amazon, Alibaba, JD, Pinduoduo) influenced design, collection, or analysis, avoiding conflicts of interest. Prior to the pilot and main data collection, the protocol (consent script, survey, recruitment, and data-security plan) were submitted for Research Ethics Committee/IRB approval, and the study commenced only after approval conditions were met. The consent page provided contact details for the researcher and the institution's ethics office, explained how participants may request data withdrawal prior to de-identification/aggregation, and offered a way to receive a summary of results after study completion.

3. Results and discussion

Table 1

Summary Table of Level of Consumer Trust

Indicators	Weighted Mean	Verbal Interpretation	Rank
Reliability	2.85	Agree	3
Security	2.87	Agree	1.5
Credibility	2.87	Agree	1.5
Composite Mean	**2.86**	**Agree**	

Legend: 3.50-4.00=Strongly Agree; 2.50-3.49=Agree; 1.50-2.49=Disagree; 1.00-1.49=Strongly Disagree

Table 1 presents a consolidated summary of the level of consumer trust in e-commerce platforms across three core dimensions: reliability, security, and credibility. It obtained an overall composite mean of 2.86, verbally interpreted as agree, indicating that consumers exhibit a moderate and favorable level of trust toward e-commerce platforms. This suggests that although trust has not reached a strongly affirmative level, platforms have satisfactorily met consumers' expectations in terms of performance consistency, protection mechanisms, and ethical conduct. Among the three dimensions, security and credibility emerged as the highest-ranked factors, both obtaining a weighted mean of 2.87. The prominence of security highlights consumers' heightened concern for the protection of personal and financial information in digital transactions. This aligns with studies demonstrating that perceived security, through data protection, fraud prevention, and secure payment systems is a primary trust antecedent in e-commerce, directly influencing consumers' willingness to engage in online purchase (Singh et al., 2024). When consumers believe that platforms can safeguard sensitive information, their perceived vulnerability decreases, thereby strengthening trust.

Similarly, the high ranking of credibility indicates that consumers place significant value on ethical conduct, truthful communication, and fairness in platform operations. Credibility helps mitigate information asymmetry by assuring consumers that product claims are reliable and that the platform acts in their best interest. Sung et al. (2023) found that credible platforms avoid misleading promotions and ensure transparency to gain consumer confidence and encourage purchase intention. Singh et al. (2024) further emphasized that credibility enhances trusting beliefs by reinforcing perceptions of institutional integrity and fairness. In contrast, reliability (2.85) ranked lowest among the three trust dimensions, although it remains verbally interpreted as agree. This suggests that while consumers believe platforms can fulfill their promises, confidence in consistent service performance is comparatively weaker than confidence in security and credibility. Prior studies note that reliability is often shaped by consumers' accumulated experiences across multiple transactions; occasional delivery delays, order inaccuracies, or service inconsistencies that diminish reliability perceptions over time (Qalati et al., 2020). As reliability is reinforced through repeated successful interactions, its lower rank indicates an area where platforms must focus on sustaining service quality and operational consistency.

Table 2

Summary Table of Level of Consumer Purchase Intention

Indicators	Weighted Mean	Verbal Interpretation	Rank
Attitudinal Intention	2.89	Agree	1
Behavioral Intention	2.84	Agree	2
Purchase Decision Confidence	2.82	Agree	3
Composite Mean	**2.85**	**Agree**	

Table 2 presents a summary of the level of consumer purchase intention across three key dimensions: attitudinal intention, behavioral intention, and purchase decision confidence. It yielded an overall composite mean of 2.85, which is verbally interpreted as agree. This finding indicates that consumers demonstrate a positive inclination toward purchasing on the platform, suggesting that their evaluations, intended behaviors, and confidence levels collectively support engagement in online transactions. Among the three dimensions, attitudinal intention emerged as the highest-ranked factor with a weighted mean of (2.89). This suggests that consumers' positive evaluations, satisfaction, enjoyment, and preference toward the platform form the strongest foundation of purchase intention. Attitudinal intention reflects consumers' internal assessment that purchasing on the platform is desirable and worthwhile. Nguyen et al. (2023) demonstrate that attitude toward online purchasing is one of the strongest predictors of purchase intention. Similarly, Ghosh (2024) emphasized that positive attitudes, shaped by satisfaction and enjoyment, play a central role in driving consumers' readiness to purchase in e-commerce contexts.

The lowest-ranked dimension is purchase decision confidence, which obtained a weighted mean of 2.82 though still verbally interpreted as agree. This suggests that while consumers feel confident, safe, and assured when making purchases, decision confidence is comparatively weaker than attitudinal and behavioral tendencies. Decision confidence reflects consumers' certainty regarding the correctness and value of their purchase choices. Ghosh (2024) similarly argued that in highly competitive e-commerce environments, consumers may exhibit purchase intention while still experiencing residual doubt regarding value optimization. The results indicate that consumer purchase intention is predominantly attitude-driven, supported by behavioral willingness and moderated by decision confidence. The ranking pattern suggests a progression in which positive attitudes form the strongest base, followed by actionable intentions, while confidence in decision-making remains an area with potential for enhancement. Strengthening transparent value propositions, consistent experience delivery, and reassurance mechanisms may help elevate purchase decision confidence, thereby reinforcing the overall strength of consumer purchase intention in e-commerce platforms.

Table 3 presents the relationship between consumer trust and consumer purchase intention, revealing consistently strong and statistically significant relationships across all variables. The results indicate that the sub-variables of consumer trust such as reliability, security, and credibility are all highly correlated with attitudinal intention, behavioral intention, and purchase decision confidence (ρ ranging from .918 to .965, $p < .001$). This suggests that as consumers perceive higher levels of trust in a product or service, their intention to purchase and confidence in their purchasing decisions also increase substantially.

Specifically, reliability demonstrates very strong positive correlations with attitudinal intention ($\rho = .918$), behavioral intention ($\rho = .934$), and purchase decision confidence ($\rho = .936$). This implies that when consumers perceive a product or service as dependable and consistent, they are more likely to develop favorable attitudes, exhibit stronger purchase behaviors, and feel more assured in their decisions. This result is strongly supported by prior studies. Qalati et al. (2020) demonstrated that reliability is a critical antecedent of trust that indirectly influences purchase intention by reinforcing confidence and satisfaction in online shopping environments. More recently, Ghosh (2024) confirmed through a meta-analytic review that perceived reliability is among the most consistent predictors of online purchase intention across different market contexts.

Table 3
Relationship between Consumer Trust and Consumer Purchase Intention

Variables	rho	p-value	Interpretation
Reliability			
Attitudinal Intention	.918**	<.001	Highly Significant
Behavioral Intention	.934**	<.001	Highly Significant
Purchase Decision Confidence	.936**	<.001	Highly Significant
Security			
Attitudinal Intention	.942**	<.001	Highly Significant
Behavioral Intention	.950**	<.001	Highly Significant
Purchase Decision Confidence	.918**	<.001	Highly Significant
Credibility			
Attitudinal Intention	.950**	<.001	Highly Significant
Behavioral Intention	.965**	<.001	Highly Significant
Purchase Decision Confidence	.938**	<.001	Highly Significant

Legend: Significant at p-value<0.01

Similarly, security yields strong and highly significant relationships with all purchase intention indicators, particularly behavioral intention (ρ = .950), indicating that consumers who feel secure especially in terms of transactions and data protection are more inclined to act on their purchase intentions. This highlights the critical role of perceived safety in influencing not only attitudes but also actual purchasing behavior. Recent literature strongly supports this relationship. Singh et al. (2024) found that perceived information security and data protection significantly enhance trusting beliefs, which subsequently drive behavioral intention in e-commerce platforms. Bahari et al. (2024) similarly reported that security perceptions reduce financial and privacy-related risks, thereby increasing consumers' willingness to proceed with online purchases.

Moreover, credibility shows the strongest correlations among all trust dimensions, particularly with behavioral intention (ρ = .965) and attitudinal intention (ρ = .950). This suggests that when consumers view a brand or platform as trustworthy, honest, and credible, it greatly enhances both their willingness to purchase and their confidence in making such decisions. This finding aligns with recent empirical research. Sung et al. (2023) demonstrated that credibility expressed through truthful information and ethical promotional practices, has a powerful effect on consumer trust and behavioral intention. Singh et al. (2024) further showed that perceived platform credibility significantly strengthens attitudinal intention and mediates the relationship between trust and continued platform usage. Additionally, Ghosh (2024) identified credibility as one of the strongest trust-related predictors of online purchase intention, particularly in competitive e-commerce environments where consumers actively compare platforms.

Table 4
Proposed Action Plan to Enhance Trust-Related Features of E-Commerce Platforms

Key Result Area Objective	Strategies	Success Indicators	Responsible Unit
Reliability To ensure that the e-commerce platform consistently delivers products as promised.	1. Strengthen logistics partnerships by implementing service-level agreements (SLAs) with delivery providers to ensure on-time and accurate deliveries. 2. Introduce real-time order tracking and proactive delivery notifications to manage customer expectations and reduce uncertainty.	Increased on- time delivery rate • Reduced delivery-related complaints • Higher customer satisfaction scores on delivery performance	Operations Department Logistics and Supply Chain Unit

Security To enhance consumers' sense of security when making online payments on the platform.	1. Integrate advanced payment security technologies such as multi-factor authentication and encrypted payment gateways. 2. Conduct regular security audits and visibly display security certifications to reassure consumers during checkout.	• Reduced payment-related complaints • Increased completion rate of online transactions • Higher perceived payment security ratings	IT Department Information Security Unit
Credibility To ensure that the platform provides accurate and truthful product information.	1. Establish a product information verification system requiring sellers to submit validated descriptions and images. 2. Introduce penalties and monitoring mechanisms for sellers who provide misleading or inaccurate product information.	• Reduced product-related complaints • Higher accuracy ratings in product listings • Improved consumer trust in platform information	Marketplace Management Unit Quality Assurance Team

4. Conclusion and recommendations

Majority of the respondents trust e-commerce platforms at an agreeable level. Majority of the respondents exhibit a positive level of purchase intention. There is a highly significant and strong relationship between consumer trust and all dimensions of purchase intention. An action plan was proposed focusing on improving delivery reliability, strengthening payment and data security, and ensuring accurate product information to reinforce consumer trust and sustain purchase intention. It is recommended for E-commerce platforms to invest in logistics optimization, real-time tracking systems, and performance monitoring to reduce service lapses that undermine consumer trust. Platform managers may upgrade security infrastructures, particularly in payment processing and personal data protection to reassure consumers and reduce perceived risk during transactions. E-commerce platforms may implement stricter controls to ensure that product information, pricing claims, and promotional messages are accurate and truthful. E-commerce platforms may utilize the proposed action plan to enhance trust-related features of e-commerce platforms. Future studies may explore additional dimensions of trust, such as emotional trust, social influence, or brand community effects, to provide a more comprehensive understanding of consumer behavior in e-commerce.

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Instructional leadership, faculty competence, and curriculum innovation in hospitality management programs of selected higher education institutions in Bulacan: Inputs to quality assurance system

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Abstract

This study examined instructional leadership, faculty competence, and curriculum innovation in selected Higher Education Institutions (HEIs) offering Hospitality Management programs in Bulacan. Using a descriptive-correlational research design, the study gathered data from 369 respondents, consisting of program chairs, faculty members, students, and quality assurance officers from five HEIs. Data were analyzed using frequency and percentage, weighted mean, Analysis of Variance (ANOVA), and Pearson Product-Moment Correlation. The findings revealed that instructional leadership, faculty competence, and curriculum innovation were consistently perceived as evident across the participating institutions. Statistical analysis further showed no significant differences in the assessments of the four respondent groups, indicating a shared perception of the current practices implemented in their respective programs. However, a very strong positive relationship was found between instructional leadership and curriculum innovation, as well as between faculty competence and curriculum innovation, emphasizing the importance of effective leadership and competent faculty in promoting curriculum enhancement. Respondents also acknowledged challenges related to leadership practices, faculty development, and curriculum implementation. Based on these findings, a comprehensive Quality Assurance System was developed to address identified concerns and strengthen continuous program improvement. The proposed framework was evaluated as highly suitable, highly acceptable, and highly feasible by the respondents, demonstrating its potential to support institutional quality enhancement. The study concludes that strengthening instructional leadership, enhancing faculty competence, and sustaining curriculum innovation are essential strategies for improving the quality and competitiveness of Hospitality Management programs in Higher Education Institutions.

Keywords: instructional leadership, faculty competence, curriculum innovation, quality assurance system, hospitality management, higher education institutions, Bulacan

Instructional leadership, faculty competence, and curriculum innovation in hospitality management programs of selected higher education institutions in Bulacan: Inputs to quality assurance system

1. Introduction

Higher Education Institutions (HEIs) play a significant role in developing competent graduates by ensuring that academic programs remain relevant, responsive, and aligned with industry demands. In Hospitality Management education, program quality is essential because graduates are expected to possess the knowledge, skills, and competencies required in a dynamic and competitive industry. Instructional leadership, faculty competence, and curriculum innovation are widely recognized as fundamental elements in achieving and sustaining the quality of academic programs in higher education. Effective instructional leadership provides strategic direction, promotes collaboration, supports faculty development, and ensures that teaching and learning practices are aligned with the institution's mission, vision, and quality standards. Through strong leadership, academic institutions are better positioned to foster a culture of continuous improvement, accountability, and instructional excellence.

Equally important is faculty competence, as the quality of instruction largely depends on educators' knowledge, skills, professional experience, research capability, and technological proficiency. Competent faculty members are better equipped to implement learner-centered teaching strategies, integrate emerging technologies into instruction, and create meaningful learning experiences that promote student engagement and academic success. Continuous professional development further enables educators to respond effectively to evolving educational practices and the changing demands of the hospitality industry. Curriculum innovation also plays a vital role in ensuring that Hospitality Management programs remain relevant, responsive, and aligned with current industry expectations. Regular curriculum review, the integration of outcomes-based education, digital learning approaches, sustainability concepts, and experiential learning opportunities help prepare graduates with the competencies required in today's dynamic hospitality and tourism sector. A responsive curriculum not only enhances the quality of instruction but also strengthens graduates' employability and readiness for professional practice.

While numerous studies have examined instructional leadership, faculty competence, and curriculum innovation, these variables have often been investigated separately, focusing on their individual effects on educational outcomes. Relatively few studies have explored how these three factors work together to influence the overall quality of academic programs and institutional quality assurance. This gap is particularly evident in Hospitality Management education, where program quality depends not only on effective leadership or competent faculty but also on the continuous alignment of the curriculum with industry standards and stakeholder expectations. By examining these variables collectively, the present study seeks to provide a more holistic understanding of the factors that contribute to quality assurance and the continuous improvement of Hospitality Management programs in selected higher education institutions.

Anchored in the principles of outcomes-based education and quality assurance, this study views program quality as the result of effective instructional leadership, competent faculty, and innovative curriculum implementation. Understanding how these variables relate to one another may provide valuable insights for strengthening academic programs and improving institutional performance. Therefore, this study aims to assess instructional leadership, faculty competence, and curriculum innovation; determine their relationships with program quality; identify existing challenges; and develop inputs for a Quality Assurance System for selected Higher Education Institutions offering Hospitality Management programs in Bulacan.

Objectives of the Study - The main objective of this study is to assess the instructional leadership, faculty competence, and curriculum innovation in the Hospitality Management programs of selected higher education institutions (HEIs) in Bulacan. Specifically, it aims to evaluate instructional leadership practices, faculty competence, and curriculum innovation as perceived by program chairs, faculty members, students, and evaluators; determine whether significant differences exist in the assessments of the four groups of respondents; examine the relationship among instructional leadership, faculty competence, and curriculum innovation; identify the challenges encountered in these areas; and propose quality assurance system inputs, as well as assess their suitability, acceptability, and feasibility.

2. Methods

Research Design - This study employed a descriptive quantitative research design to examine instructional leadership, faculty competence, and curriculum innovation in Hospitality Management programs at selected Higher Education Institutions (HEIs) in Bulacan. Descriptive research is widely used to systematically describe existing conditions, characteristics, perceptions, attitudes, and practices of a specific population without manipulating the variables under investigation. According to Creswell et al. (2023), descriptive research provides an accurate and objective description of phenomena as they naturally occur, allowing researchers to obtain factual information that can serve as the basis for analysis, interpretation, policy formulation, and program improvement.

Since the present study sought to determine the current status of instructional leadership, faculty competence, and curriculum innovation; identify the challenges encountered; and evaluate the proposed Quality Assurance System, the descriptive research design provided an appropriate framework for gathering quantitative data from multiple stakeholder groups. The design enabled the researcher to examine the perceptions of program chairs, faculty members, students, and quality assurance officers without introducing any intervention or experimental manipulation. Moreover, the findings from this approach provided empirical evidence that served as the foundation for developing a Quality Assurance System to strengthen Hospitality Management programs at the participating higher education institutions.

The descriptive quantitative research design was appropriate because the study focused on describing and assessing the existing conditions of instructional leadership, faculty competence, and curriculum innovation rather than establishing causal relationships or testing interventions. It enabled the researcher to collect standardized data from different stakeholder groups using a structured questionnaire, allowing comparisons across respondents. Furthermore, because the study aimed to generate evidence-based inputs for a proposed Quality Assurance System, a descriptive design was the most suitable approach for obtaining reliable baseline information that accurately reflects current institutional practices and serves as a sound basis for educational planning and continuous quality improvement.

Population and Sampling - The study involved 369 respondents from selected Higher Education Institutions (HEIs) in Bulacan offering the Bachelor of Science in Hospitality Management (BSHM) program. The respondents comprised 5 Program Chairs/Coordinators, 5 Academic Evaluators or Quality Assurance (QA) Officers, 57 Faculty Members, and 302 Students. These stakeholder groups were selected because of their direct involvement in the planning, implementation, supervision, evaluation, and continuous improvement of Hospitality Management programs, providing comprehensive perspectives on instructional leadership, faculty competence, curriculum innovation, and quality assurance.

The study employed purposive sampling, a non-probability sampling technique that selects participants based on characteristics relevant to the research objectives. According to Campbell et al. (2020), purposive sampling enables researchers to identify information-rich participants who possess the knowledge and experience necessary to provide meaningful insights. Program Chairs and QA Officers were included through complete enumeration because of their limited number and critical roles in academic leadership, curriculum implementation, accreditation, and quality assurance. Faculty Members were purposively selected due to their responsibilities in instruction, research, and curriculum delivery, while Students were included as the primary beneficiaries of instructional and curricular practices.

The final sample provided adequate representation of the major stakeholders in Hospitality Management education across the participating HEIs. By incorporating the perspectives of academic leaders, quality assurance personnel, faculty members, and students, the study generated comprehensive, credible, and relevant data. This sampling procedure strengthened the validity of the findings and provided a sound basis for developing the proposed Quality Assurance System for Hospitality Management programs.

Research Instrument - The primary data-gathering instrument used in this study was a researcher-made structured questionnaire developed based on the study's objectives, conceptual framework, and an extensive review of related literature and studies. The questionnaire was designed to assess instructional leadership, faculty competence, curriculum innovation, challenges encountered, and the proposed Quality Assurance System for Hospitality Management programs in selected Higher Education Institutions (HEIs) in Bulacan. The questionnaire was anchored on established theories, standards, policies, and quality assurance frameworks. It was reviewed by the research adviser, validated by experts, and revised based on the validators' recommendations to ensure its content validity and relevance.

The questionnaire consisted of eight parts. Part I gathered the respondents' demographic profile, including age, sex, civil status, educational attainment, and years of service. Part II assessed instructional leadership in terms of vision and mission alignment, academic planning and supervision, faculty motivation and mentoring, evaluation and performance monitoring, resource allocation and management, and collaboration and shared governance. Part III measured faculty competence in the areas of pedagogical skills and instructional design, research capability and publication, industry experience and certification, technological integration in teaching, professional development and training, and student engagement and mentorship. Part IV evaluated curriculum innovation in terms of outcomes-based education alignment, integration of sustainability and hospitality concepts, digital and hybrid learning models, assessment and feedback systems, entrepreneurial course components, and continuous curriculum review and benchmarking. Part V identified the challenges encountered in instructional leadership, faculty competence, and curriculum innovation. Parts VI, VII, and VIII assessed the suitability, acceptability, and feasibility, respectively, of the proposed Quality Assurance System. All items in Parts II to VIII were measured using a five-point Likert scale to determine the respondents' perceptions and assessments of the study variables. The responses served as the basis for evaluating instructional leadership, faculty competence, curriculum innovation, challenges encountered, and the proposed Quality Assurance System.

Data Gathering Procedures - The data collection process followed a systematic procedure to ensure ethical compliance and the integrity of the research. First, the researcher secured permission to conduct the study by submitting a request letter to the Presidents, Academic Heads, or authorized officials of the selected Higher Education Institutions (HEIs) in Bulacan offering Hospitality Management programs. Upon approval, the researcher coordinated with the concerned offices to identify the qualified respondents based on the established inclusion criteria. Survey questionnaire was then administered to the Program Chairs, QA Officers, Faculty Members, and Students through Google Forms. Before answering the questionnaire, the respondents were informed of the study's purpose and provided with the necessary instructions. After the data collection period, the accomplished questionnaires were retrieved and checked for completeness. The collected data were subsequently organized, coded, tabulated, and subjected to appropriate statistical analysis. Finally, the results were presented in both tabular and textual forms to facilitate interpretation and discussion of the findings.

Statistical Treatment of Data - The study employed both descriptive and inferential statistical techniques to analyze the data and address the research objectives. Percentage was used to describe the respondents' demographic profile, while the weighted mean determined the respondents' assessments of instructional leadership, faculty competence, curriculum innovation, challenges encountered, and the proposed Quality Assurance System. Analysis of Variance (ANOVA) was used to determine significant differences among the assessments of the four groups of respondents. Pearson Product-Moment Correlation (Pearson **r**) measured the strength and direction of the relationships among instructional leadership, faculty competence, and curriculum innovation, while the **t**-test was used to determine the significance of the computed correlation coefficients. These statistical tools provided a comprehensive basis for interpreting the findings and developing the proposed Quality Assurance System.

Percentage was used to present the distribution of respondents according to their demographic profile and participating institution. As noted by Lohr (2022), percentage is widely used in survey research to describe respondent characteristics. Weighted Mean was used to determine the level of instructional leadership, faculty competence, curriculum innovation, challenges encountered, and the evaluation of the proposed Quality Assurance System. Boone et al. (2012) stated that the weighted mean is an appropriate measure for summarizing responses obtained through a Likert scale. The weighted mean was used to answer the statements of the problem concerning the assessment of instructional leadership, faculty competence, curriculum innovation, challenges encountered, and the suitability, acceptability, and feasibility of the proposed Quality Assurance System. All assessment items were measured using a five-point Likert scale with corresponding verbal interpretations. Analysis of Variance (ANOVA) was employed to determine whether significant differences existed in the assessments of the four groups of respondents. Pearson Product-Moment Correlation (Pearson **r**) was used to determine the strength and direction of the relationships among instructional leadership, faculty competence, and curriculum innovation. Schober et al. (2018) explained that Pearson **r** measures the degree of linear relationship between continuous variables. The t-test for the significance of the coefficient of correlation was used to determine whether the computed correlation coefficients were statistically significant. The interpretation of the correlation coefficients followed the guide proposed by Schober et al. (2018): 0.00–0.10 (negligible), 0.11–0.39 (weak), 0.40–0.69 (moderate), 0.70–0.89 (strong), and 0.90–1.00 (very strong). The same interpretation was applied to both positive and negative correlation coefficients.

3. Result and discussion

Table 1
Summary of Instructional Leadership in Hospitality Management Program

Criteria	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Vision and Mission Alignment	3.94	E	4.32	HE	3.59	E	4.50	HE	4.09	E	1
Academic Planning and Supervision	3.76	E	4.31	HE	3.54	E	4.34	HE	3.99	E	4
Faculty Motivation and Mentoring	3.64	E	4.30	HE	3.54	E	4.30	HE	3.94	E	6
Evaluation and Performance Monitoring	3.76	E	4.32	HE	3.57	E	4.38	HE	4.01	E	3
Resource Allocation and Management	3.52	E	4.33	HE	3.59	E	4.44	HE	3.97	E	5
Collaboration and Shared Governance	3.86	E	4.34	HE	3.57	E	4.42	HE	4.05	E	2
Grand Mean	3.75	E	4.32	HE	3.57	E	4.40	HE	4.01	E	

Table 1 presents the assessment of instructional leadership in the Hospitality Management program, which obtained a grand mean of 4.01, verbally interpreted as Evident. Among the dimensions, vision and mission alignment ranked first with a composite weighted mean of 4.09, followed by collaboration and shared governance (4.05), evaluation and performance monitoring (4.01), academic planning and supervision (3.99), resource allocation and management (3.97), and faculty motivation and mentoring (3.94). All dimensions were rated Evident. Among the respondent groups, Academic Evaluators/QA Officers gave the highest assessment, rating instructional leadership as Highly Evident (4.40), followed by Faculty Members (4.32). Meanwhile, Program Chairs/Coordinators (3.75) and Students (3.57) assessed instructional leadership as Evident.

This shows that the Hospitality Management program has generally effective instructional leadership that supports improvements in teaching, academic management, and program operations. It highlights that leadership practices are helping maintain the quality of instruction and alignment with institutional goals. At the same time, it shows that there is still room for improvement, as most areas were rated only as evident, indicating the need for continuous development and stronger leadership practices to achieve greater effectiveness. This implies that instructional leadership is effectively evident in the Hospitality Management program and contributes to improvements in teaching, academic management, and program quality. This perspective is consistent with Bush (2021), who emphasized that instructional leadership is a comprehensive process that promotes teaching effectiveness, organizational performance, and continuous school improvement through strategic direction, instructional support, and effective management practices. The author further noted that instructional leaders play a vital role in fostering a culture of excellence by guiding instructional programs, supporting faculty development, and ensuring that institutional goals are achieved. Consequently, the findings suggest that while instructional leadership is generally evident in the Hospitality Management program, continuous enhancement of leadership practices remains necessary to strengthen instructional quality, improve program effectiveness, and sustain quality assurance initiatives.

Table 2
Summary of Faculty Competence in Hospitality Management Program

Criteria	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Pedagogical Skills and Instructional Design	3.94	E	4.54	HE	3.56	E	4.38	HE	4.10	E	2.5
Research Capability and Publication	3.98	E	4.54	HE	3.58	E	4.22	HE	4.08	E	4
Industry Experience and Certification	3.78	E	4.52	HE	3.55	E	4.28	HE	4.03	E	6
Technological Integration in Teaching	3.98	E	4.52	HE	3.56	E	4.56	HE	4.15	E	1
Professional Development and Training	3.86	E	4.50	HE	3.54	E	4.36	HE	4.07	E	5
Student Engagement and Mentorship	3.88	E	4.54	HE	3.60	E	4.38	HE	4.10	E	2.5
Grand Mean	3.90	E	4.53	HE	3.57	E	4.36	HE	4.09	E	

Table 2 presents the assessment of faculty competence in the Hospitality Management program, which obtained a grand mean of 4.09, verbally interpreted as Evident. Among the dimensions, technological integration in teaching ranked first with a composite weighted mean of 4.15, followed by pedagogical skills and instructional design (4.10), student engagement and mentorship (4.10), research capability and publication (4.08), professional development and training (4.07), and industry experience and certification (4.03). All dimensions were rated Evident. Among the respondent groups, Faculty Members gave the highest assessment, rating faculty competence as Highly Evident (4.53), followed by Academic Evaluators/QA Officers (4.36). Meanwhile, Program Chairs/Coordinators (3.90) and Students (3.57) assessed faculty competence as Evident.

This implies that faculty competence in the Hospitality Management program is evident across areas, indicating that faculty members possess the knowledge, skills, and teaching practices needed to support quality instruction. This further implies that the program values effective teaching, technological integration, research, professional growth, and industry relevance in developing competent educators.

This interpretation is reinforced by Villaluna (2024), who found that Hospitality and Tourism faculty members demonstrated high levels of competency across various professional and industry-related domains. The study emphasized that competent educators possess the knowledge, skills, and professional expertise necessary to deliver relevant and effective instruction and to prepare students for industry demands. Findings highlighted the importance of continuous professional engagement and competency enhancement to maintain instructional quality and responsiveness to evolving educational and industry standards. These findings suggest that while faculty competence is generally evident, continuous improvement remains essential to ensure that quality teaching practices and professional competencies are consistently demonstrated in the learning environment.

Table 3 presents the assessment of curriculum innovation in the Hospitality Management program, which obtained a grand mean of 4.01, verbally interpreted as Evident. Among the dimensions, digital and hybrid learning models ranked first with a composite weighted mean of 4.03, followed by integration of sustainability and hospitality concepts (4.02). Assessment and feedback systems, entrepreneurial course components, and continuous curriculum review and benchmarking each obtained a composite weighted mean of 4.00, while outcomes-based education alignment ranked last with a composite weighted mean of 3.99. All dimensions were rated Evident. Among the respondent groups, Faculty Members gave the highest assessment, rating curriculum innovation as Highly Evident (4.36), followed by Academic Evaluators/QA Officers (4.32). Meanwhile, Program Chairs/Coordinators (3.88) and Students (3.47) assessed curriculum innovation as Evident. This implies that curriculum innovation in the Hospitality Management program is generally evident, showing that the program continuously adapts its curriculum to support quality, relevant, and industry-responsive education. This further implies that the program promotes modern teaching approaches, sustainability, entrepreneurship, and continuous curriculum improvement to enhance student learning. This perspective is echoed by Stensaker et al. (2022), who emphasized that curriculum innovation and quality enhancement are continuous processes that enable higher education institutions to respond effectively to changing educational demands, industry expectations, and stakeholder needs. The study highlighted that innovative curricular practices contribute to improved program relevance, enhanced student learning experiences, and stronger institutional quality.

Table 3

Summary of Curriculum Innovation in Hospitality Management Program

Criteria	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Outcomes-Based Education Alignment	3.94	E	4.35	HE	3.44	E	4.24	HE	3.99	E	6
Integration of Sustainability and Hospitality Concepts	4.04	E	4.37	HE	3.47	E	4.20	HE	4.02	E	2
Digital and Hybrid Learning Models	3.92	E	4.36	HE	3.47	E	4.38	HE	4.03	E	1
Assessment and Feedback Systems	3.72	E	4.34	HE	3.47	E	4.46	HE	4.00	E	3.33
Entrepreneurial Course Components	3.74	E	4.38	HE	3.48	E	4.40	HE	4.00	E	3.33
Continuous Curriculum Review and Benchmarking	3.94	E	4.34	HE	3.46	E	4.24	HE	4.00	E	3.33
Grand Mean	3.88	E	4.36	HE	3.47	E	4.32	HE	4.01	E	

Table 4

Correlation Between Instructional Leadership and Curriculum Innovation in Hospitality Management Program

Indicators	r-value	VI	df	t-value	Critical value	Int.	Decision
Vision and Mission Alignment	0.99	VSC	41	4.24027	1.734	Significant	Reject H_o
Academic Planning and Supervision	0.99	VSC	41	4.23826	1.734	Significant	Reject H_o
Faculty Motivation and Mentoring	0.99	VSC	41	4.23981	1.734	Significant	Reject H_o
Evaluation and Performance Monitoring	0.99	VSC	41	4.23142	1.734	Significant	Reject H_o
Resource Allocation and Management	0.99	VSC	41	4.24135	1.734	Significant	Reject H_o
Collaboration and Shared Governance	0.99	VSC	41	4.24022	1.734	Significant	Reject H_o

Legend: 1.00 – Perfect Correlation (PC); 0.71–0.99 – Very Strong Correlation (VSC); 0.51–0.70 – Strong Correlation (SC); 0.31–0.50 – Moderate Correlation (MC); 0.11–0.30 – Weak Correlation (WC); and 0.00–0.10 – Negligible Correlation (NC).

Table 4 presents the relationship between instructional leadership and curriculum innovation in the Hospitality Management program. Using a t-test at the 0.05 level of significance with 41 degrees of freedom and a critical value of 1.734, all indicators yielded an r-value of 0.99, indicating a Very Strong Correlation (VSC). The computed t-values ranged from 4.23142 to 4.24135, all of which exceeded the critical value. Consequently, the null hypothesis was rejected for all indicators, indicating a significant relationship between instructional leadership and curriculum innovation. The findings imply that instructional leadership and curriculum innovation are significantly related in the Hospitality Management Program. The very strong positive correlations indicate that effective leadership practices contribute substantially to the development, implementation, and continuous improvement of innovative curricular initiatives. This observation is reinforced by Tanveer et al. (2025), who emphasized that effective educational leadership fosters innovation, organizational improvement, and responsiveness to changing academic and industry demands. The study highlighted that leadership practices that support collaboration, professional growth, and strategic decision-making create favorable conditions for the successful implementation of educational innovations. Consequently, the significant relationship between instructional leadership and curriculum innovation suggests that strengthening leadership practices can further enhance the quality, relevance, and continuous improvement of the curriculum within the Hospitality Management Program.

Table 5
Correlation Between Faculty Competence and Curriculum Innovation of the Hospitality Management Program

Indicators	r-value	VI	df	t-value	Critical value	Int.	Decision
Pedagogical Skills and Instructional Design	0.99	VSC	41	4.24124	1.734	Significant	Reject H_o
Research Capability and Publication	0.99	VSC	41	4.23853	1.734	Significant	Reject H_o
Industry Experience and Certification	0.99	VSC	41	4.24039	1.734	Significant	Reject H_o
Technological Integration in Teaching	0.99	VSC	41	4.24076	1.734	Significant	Reject H_o
Professional Development and Training	0.99	VSC	41	4.24121	1.734	Significant	Reject H_o
Student Engagement and Mentorship	0.99	VSC	41	4.24085	1.734	Significant	Reject H_o

Table 5 depicts the correlation between faculty competence and curriculum innovation in the Hospitality Management Program. The relationship was tested using a t-test with 41 degrees of freedom at the 0.05 level of significance, with a critical value of 1.734. The results revealed that all indicators obtained an r-value of 0.99, interpreted as Very Strong Correlation (VSC). The computed t-values were 4.24124 for Pedagogical Skills and Instructional Design; 4.23853 for Research Capability and Publication; 4.24039 for Industry Experience and Certification; 4.24076 for Technological Integration in Teaching; 4.24121 for Professional Development and Training; and 4.24085 for Student Engagement and Mentorship. Since all computed t-values were greater than the critical value of 1.734, the null hypothesis was rejected in all indicators. The findings imply that faculty competence and curriculum innovation are significantly related in the Hospitality Management Program. The very strong positive correlations indicate that competent faculty members contribute substantially to the development, implementation, and continuous improvement of innovative curricular practices. This finding is consistent with the study of Allen et al. (2024), who emphasized that faculty competence plays a crucial role in promoting instructional innovation and improving educational outcomes. The authors highlighted that educators who continuously develop their pedagogical, technological, and professional competencies are better positioned to implement innovative teaching practices and contribute to curriculum enhancement.

Table 6 presents the assessment of the challenges encountered relative to instructional leadership, which obtained an overall weighted mean of 3.85, verbally interpreted as Encountered. The most frequently encountered challenge was difficulty in coordinating with external stakeholders (3.94), followed by insufficient leadership training for program administrators (3.93), limited clarity in the alignment of vision and mission with program implementation (3.91), lack of transparency in leadership processes (3.89), constraints in decision-making authority (3.87), challenges in academic planning and monitoring (3.86), limited faculty participation in shared governance (3.85), insufficient mentoring support for faculty members (3.80), delayed feedback on faculty performance evaluation (3.79), and inadequate supervision of instructional delivery (3.65). All indicators were rated Encountered. Among the respondent groups, Students and Academic Evaluators/QA Officers reported the highest level of challenges, both with an overall weighted mean of 3.88, followed by Program Chairs/Coordinators (3.84) and Faculty Members (3.79). All groups assessed the challenges as Encountered.

Table 6
Challenges Encountered Relative to Instructional Leadership

Indicators	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Identifies limited clarity in the alignment of vision and mission with program implementation.	4.00	E	3.86	E	3.79	E	4.00	E	3.91	E	3
Experiences inadequate supervision of instructional delivery.	3.40	E	3.75	E	3.86	E	3.60	E	3.65	E	10
Encounters insufficient mentoring support for faculty members.	3.80	E	3.74	E	3.84	E	3.80	E	3.80	E	8
Reports delayed feedback on	3.80	E	3.74	E	3.81	E	3.80	E	3.79	E	9

faculty performance evaluation.											
Observes limited participation of faculty in shared governance.	3.80	E	3.68	E	3.90	E	4.00	E	3.85	E	7
Notes challenges in effective academic planning and monitoring.	3.80	E	3.91	E	3.91	E	3.80	E	3.86	E	6
Experiences constraints in decision-making authority.	3.80	E	3.72	E	3.94	E	4.00	E	3.87	E	5
Identifies lack of transparency in leadership processes.	4.00	E	3.79	E	3.95	E	3.80	E	3.89	E	4
Encounters difficulties in coordinating with external stakeholders.	4.00	E	3.86	E	3.91	E	4.00	E	3.94	E	1
Reports on insufficient leadership training for program administrators.	4.00	E	3.81	E	3.90	E	4.00	E	3.93	E	2
Overall Weighted Mean	3.84	E	3.79	E	3.88	E	3.88	E	3.85	E	

Legend: 4.20–5.00 (5) – Highly Encountered (HE); 3.40–4.19 (4) – Encountered (E); 2.60–3.39 (3) – Moderately Encountered (ME); 1.80–2.59 (2) – Least Encountered (LE); and 1.00–1.79 (1) – Not Encountered (NE).

This implies that Instructional Leadership Challenges are encountered in the Hospitality Management program through difficulties in stakeholder coordination, limited leadership training, a lack of transparency in leadership processes, constraints in decision-making authority, and challenges in academic planning, monitoring, and faculty participation. This study is supported by Prestoza et al. (2025), who identified several challenges related to instructional leadership, faculty development, and instructional improvement. Their study highlighted difficulties in sustaining professional development, balancing responsibilities, and strengthening collaboration and leadership support to improve teaching quality and student outcomes. Similarly, the present study found that faculty members in the Hospitality Management program face challenges with industry integration, research involvement, access to technology, and professional development. The findings also indicate that stronger institutional support and more opportunities for training and skills enhancement are necessary to further improve faculty competence and instructional performance.

Table 7 presents the assessment of the challenges encountered relative to faculty competence, which obtained an overall weighted mean of 3.91, verbally interpreted as Encountered. The most frequently encountered challenge was difficulty in integrating industry practices into instruction (4.09), followed by insufficient research engagement and publication support (4.07), limited access to updated instructional technologies (4.07), challenges in student engagement and mentoring (4.07), gaps in pedagogical skills enhancement (4.03), limited opportunities for professional development and training (3.89), limited support for advanced studies (3.88), inadequate industry exposure and certification opportunities (3.77), insufficient institutional support for skills upgrading (3.77), and difficulty in balancing teaching, research, and extension roles (3.44). All indicators were rated Encountered. Among the respondent groups, Academic Evaluators/QA Officers reported the highest level of challenges with an overall weighted mean of 4.06, followed by Program Chairs/Coordinators (4.02), Students (3.86), and Faculty Members (3.69). All groups assessed the challenges as Encountered.

This implies that faculty members in the Hospitality Management program encounter several challenges that may affect the continuous improvement of their competence and instructional performance. This further implies that difficulties with industry integration, research involvement, access to technology, and professional development are evident within the program.

This study is supported by Cruz et al. (2026), who identified several challenges affecting faculty competence and instructional delivery in hospitality education. Their study highlighted difficulties in pedagogy, student engagement, access to technology, and online instructional practices, as well as the need for stronger institutional support and additional training. Present study found that faculty members in the Hospitality Management program face challenges with industry integration, research involvement, access to technology, and professional development. The findings also indicate that continuous support, training opportunities, and skills enhancement programs are necessary to further improve faculty effectiveness and professional growth.

Table 7
Challenges Encountered Relative to Faculty Competence

Indicators	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Identifies limited opportunities for professional development and training.	4.00	E	3.81	E	3.96	E	3.80	E	3.89	E	6
Experiences difficulty in integrating industry practices into instruction.	4.20	HE	3.86	E	3.88	E	4.40	HE	4.09	E	1
Reports insufficient research engagement and publication support.	4.20	HE	3.82	E	3.85	E	4.40	HE	4.07	E	2.33
Encounters gaps in pedagogical skills enhancement.	4.00	E	3.82	E	3.88	E	4.40	HE	4.03	E	5
Notes limited access to updated instructional technologies.	4.20	HE	3.82	E	3.84	E	4.40	HE	4.07	E	2.33
Experiences challenges in student engagement and mentoring.	4.40	HE	3.63	E	3.86	E	4.40	HE	4.07	E	2.33
Identifies inadequate industry exposure and certification opportunities.	3.80	E	3.63	E	3.84	E	3.80	E	3.77	E	8.5
Reports limited support for advanced studies.	3.80	E	3.77	E	4.15	E	3.80	E	3.88	E	7
Encounters difficulty in balancing teaching, research, and extension roles.	3.40	E	3.26	ME	3.68	E	3.40	E	3.44	E	10
Observes insufficient institutional support for skills upgrading.	4.20	HE	3.46	E	3.63	E	3.80	E	3.77	E	8.5
Overall Weighted Mean	4.02	E	3.69	E	3.86	E	4.06	E	3.91	E	

Table 8 presents the assessment of the challenges encountered relative to curriculum innovation, which obtained an overall weighted mean of 3.40, verbally interpreted as Encountered. Six indicators were rated Encountered, with delays in curriculum review and revision processes ranking first (3.53), followed by limited stakeholder involvement in curriculum development (3.50), insufficient incorporation of sustainability concepts (3.47), limited integration of digital and hybrid learning models (3.45), inadequate resources for curriculum innovation (3.41), and difficulty aligning the curriculum with current industry standards (3.40). Four indicators were rated Moderately Encountered, namely difficulty in updating assessment and feedback systems (3.39), limited benchmarking with leading hospitality programs (3.34), resistance to curricular changes among stakeholders (3.26), and challenges in implementing outcomes-based education (3.24). Among the respondent groups, Faculty Members (3.59) and Students (3.53) assessed the challenges as Encountered, while Program Chairs/Coordinators (3.32) and Academic Evaluators/QA Officers (3.16) rated them as Moderately Encountered.

Table 8
Challenges Encountered Relative to Curriculum Innovation

Indicators	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Identifies delays in curriculum review and revision processes.	3.60	E	3.21	ME	3.50	E	3.80	E	3.53	E	1
Experiences difficulty aligning curriculum with current industry standards.	3.40	E	3.53	E	3.48	E	3.20	ME	3.40	E	6
Reports limited integration of digital and hybrid learning models.	3.60	E	3.49	E	3.52	E	3.20	ME	3.45	E	4
Encounters challenges in implementing outcomes-based education.	3.00	ME	3.58	E	3.57	E	2.80	ME	3.24	ME	10
Notes insufficient incorporation of sustainability concepts.	3.80	E	3.56	E	3.52	E	3.00	ME	3.47	E	3

Experiences limited benchmarking with leading hospitality programs.	3.80	E	3.84	E	3.52	E	2.20	LE	3.34	ME	8
Identifies inadequate resources for curriculum innovation.	3.80	E	3.74	E	3.49	E	2.60	ME	3.41	E	5
Reports resistance to curricular changes among stakeholders.	3.00	ME	3.35	ME	3.50	E	3.20	ME	3.26	ME	9
Encounters difficulty in updating assessment and feedback systems.	2.80	ME	3.75	E	3.59	E	3.40	E	3.39	ME	7
Observes limited stakeholder involvement in curriculum development.	2.40	LE	3.84	E	3.57	E	4.20	HE	3.50	E	2
Overall Weighted Mean	3.32	ME	3.59	E	3.53	E	3.16	ME	3.40	E	

This implies that the Hospitality Management program encounters several challenges related to curriculum innovation that may affect the timely improvement and relevance of the curriculum. This further implies that issues involving curriculum review, stakeholder participation, sustainability integration, and digital learning implementation are evident within the program. This study is supported by Miranda et al. (2023), who identified several challenges related to curriculum innovation in Tourism and Hospitality Management programs. Their study highlighted issues such as increased faculty workload, technical difficulties, reduced student participation, and challenges in implementing practical hospitality subjects through flexible learning modalities. The study also emphasized the need for continuous curriculum enhancement, technological readiness, and stronger institutional support to maintain instructional quality and industry relevance.

Table 9 presents the assessment of the suitability of the proposed inputs to the Quality Assurance System, which obtained an overall weighted mean of 4.21, verbally interpreted as Highly Suitable. Three indicators were rated Highly Suitable, with addressing the identified gaps in instructional leadership and faculty competence ranking first (4.42), followed by supporting innovation in hospitality curriculum delivery and instructional practices (4.33) and enhancing the overall quality, relevance, and effectiveness of the program (4.24). Two indicators were rated Suitable, namely meeting the requirements of CHED and recognized accrediting bodies (4.05) and aligning the proposed inputs with the institutional goals, vision, and standards of Hospitality Management programs (4.01). Among the respondent groups, Faculty Members gave the highest assessment, rating the proposed inputs as Highly Suitable (4.36), followed by Program Chairs/Coordinators (4.28). Meanwhile, Academic Evaluators/QA Officers (4.16) and Students (4.04) rated the proposed inputs as Suitable. This implies that the proposed inputs to the quality assurance system are generally considered highly suitable for addressing the needs and challenges of the Hospitality Management program. This further implies that the proposed measures can help strengthen instructional leadership, faculty competence, curriculum innovation, and overall program quality. The findings also suggest that the proposed inputs align with institutional goals and quality standards, thereby supporting continuous improvement and program effectiveness.

Table 9
Suitability of the Proposed Inputs to Quality Assurance System

Indicators	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Aligns the proposed inputs with the institutional goals, vision, and standards of Hospitality Management programs.	3.80	S	4.12	S	3.92	S	4.20	HS	4.01	S	5
Addresses the identified gaps in instructional leadership and faculty competence.	4.60	HS	4.53	HS	4.14	S	4.40	HS	4.42	HS	1
Supports innovation in hospitality curriculum delivery and instructional practices.	4.40	HS	4.37	HS	4.15	S	4.40	HS	4.33	HS	2
Enhances the overall quality, relevance, and effectiveness of the program.	4.40	HS	4.35	HS	4.01	S	4.20	HS	4.24	HS	3

Meets the requirements of CHED and recognized accrediting bodies.	4.20	HS	4.44	HS	3.96	S	3.60	S	4.05	S	4
Overall Weighted Mean	4.28	HS	4.36	HS	4.04	S	4.16	S	4.21	HS	

Legend: 4.20–5.00 (5) – Highly Suitable (HS); 3.40–4.19 (4) – Suitable (S); 2.60–3.39 (3) – Moderately Suitable (MS); 1.80–2.59 (2) – Least Suitable (LS); and 1.00–1.79 (1) – Not Suitable (NS).

This perspective is consistent with the ASEAN University Network-Quality Assurance (AUN-QA) Internal Quality Assurance Framework (2024), which emphasizes that an effective quality assurance system should be supported by integrated processes involving leadership and governance, human resource development, curriculum management, teaching and learning, assessment, stakeholder engagement, monitoring, and continuous quality improvement. The framework further highlights that quality assurance inputs must be relevant, evidence-based, and aligned with institutional objectives to ensure meaningful educational outcomes and sustainable quality enhancement. Through systematic monitoring, evaluation, and feedback mechanisms, institutions are better able to identify strengths, address areas for improvement, and foster a culture of continuous quality improvement. Consequently, the high suitability ratings of the proposed inputs indicate that the developed Quality Assurance System has the potential to serve as a responsive and effective framework for enhancing program quality, institutional effectiveness, and continuous improvement in Hospitality Management education.

Table 10
Acceptability of the Proposed Inputs to Quality Assurance System

Indicators	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Gains approval from administrators, program chairs, and academic leaders.	4.20	HA	4.44	HA	3.97	A	4.40	HA	4.25	HA	4
Receives positive acceptance from faculty members involved in implementation.	4.00	A	4.68	HA	3.96	A	4.80	HA	4.36	HA	3
Achieves support from students and external evaluators.	4.00	A	4.56	HA	3.93	A	4.40	HA	4.22	HA	5
Encourages active participation of stakeholders in the quality assurance process.	4.40	HA	4.65	HA	3.96	A	5.00	HA	4.50	HA	2
Reflects shared institutional values, priorities, and commitment to improvement.	5.00	HA	4.72	HA	4.01	A	5.00	HA	4.68	HA	1
Overall Weighted Mean	4.32	HA	4.61	HA	3.97	A	4.72	HA	4.40	HA	

Legend: 4.20–5.00 (5) – Highly Acceptable (HA); 3.40–4.19 (4) – Acceptable (A); 2.60–3.39 (3) – Moderately Acceptable (MA); 1.80–2.59 (2) – Least Acceptable (LA); and 1.00–1.79 (1) – Not Acceptable (NA).

As explained in Table 10, the assessment of the acceptability of the proposed inputs to quality assurance system rated as Highly Acceptable with an overall weighted mean of 4.40. All items rated as Highly Acceptable, these are: reflects shared institutional values, priorities, and commitment to improvement with a composite weighted mean of 4.68 as rank 1; encourages active participation of stakeholders in the quality assurance process with a composite weighted mean of 4.50 as rank 2; receives positive acceptance from faculty members involved in implementation with a composite weighted mean of 4.36 as rank 3; gains approval from administrators, program chairs, and academic leaders with a composite weighted mean of 4.25 as rank 4; and achieves support from students and external evaluators with a composite weighted mean of 4.22 as rank 5.

As to assessments of the groups of respondents on the acceptability of the proposed inputs to quality assurance system are as follows: academic evaluators / QA officers rated as Highly Acceptable with an overall weighted mean of 4.72, faculty members rated as Highly Acceptable with an overall weighted mean of 4.61, program chairs/coordinators rated as Highly Acceptable with an overall weighted mean of 4.32, and students rated as Acceptable with an overall weighted mean of 3.97. This implies that the Proposed Inputs to the Quality Assurance System are highly acceptable among program chairs/coordinators, faculty members, students, and academic evaluators/QA officers, reflecting stakeholder support, active participation, shared institutional values, and commitment to continuous quality improvement. This perspective is reinforced by Kayyali (2023), who emphasized that quality assurance in higher education involves systematic processes and mechanisms that promote accountability, institutional effectiveness, and continuous improvement. The author further highlighted that effective quality assurance systems integrate curriculum development, faculty enhancement, assessment practices, and stakeholder engagement to ensure that academic programs remain relevant and aligned with quality standards. Moreover, quality assurance frameworks encourage evidence-based decision-making and collaborative participation among stakeholders, which are essential in fostering institutional commitment and support for quality initiatives. Consequently, the high acceptability ratings indicate that the proposed inputs are well aligned with stakeholder expectations and have the potential to contribute significantly to educational quality, program effectiveness, and continuous quality improvement in Hospitality Management education.

Table 11

Feasibility of the Proposed Inputs to Quality Assurance System

Indicators	Program Chairs / Coordinators		Faculty Members		Students		Academic Evaluators / QA Officers		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	WM	VI	
Considers the availability of institutional resources and support systems.	4.60	HF	4.58	HF	4.00	F	4.80	HF	4.50	HF	2
Matches the proposed inputs with the competencies of faculty and staff.	3.60	F	4.60	HF	4.06	F	5.00	HF	4.32	HF	4
Aligns implementation plans with existing academic policies and timelines.	4.00	F	4.74	HF	3.89	F	4.60	HF	4.31	HF	5
Utilizes existing quality assurance mechanisms and organizational structures.	4.20	HF	4.70	HF	4.05	F	4.80	HF	4.44	HF	3
Demonstrates practicality and sustainability within institutional constraints.	4.80	HF	4.68	HF	3.99	F	4.60	HF	4.52	HF	1
Overall Weighted Mean	4.24	HF	4.66	HF	4.00	F	4.76	HF	4.41	HF	

Legend: 4.20–5.00 (5) – Highly Feasible (HF); 3.40–4.19 (4) – Feasible (F); 2.60–3.39 (3) – Moderately Feasible (MF); 1.80–2.59 (2) – Least Feasible (LF); and 1.00–1.79 (1) – Not Feasible (NF).

As identified in Table 11, the assessment of the feasibility of the proposed inputs to the quality assurance system was rated as Highly Feasible with an overall weighted mean of 4.41. All items rated as Highly Feasible, namely: demonstrates practicality and sustainability within institutional constraints with a composite weighted mean of 4.52 as rank 1; considers the availability of institutional resources and support systems with a composite weighted mean of 4.50 as rank 2; utilizes existing quality assurance mechanisms and organizational structures with a composite weighted mean of 4.44 as rank 3; matches the proposed inputs with the competencies of faculty and staff with a composite weighted mean of 4.32 as rank 4; and aligns implementation plans with existing academic policies and timelines with a composite weighted mean of 4.31 as rank 5.

As to assessments of the groups of respondents on the feasibility of the proposed inputs to quality assurance system are as follows: academic evaluators / QA officers rated as Highly Feasible with an overall weighted mean of 4.76, faculty members rated as Highly Feasible with an overall weighted mean of 4.66, program chairs/coordinators rated as Highly Feasible with an overall weighted mean of 4.24, and students rated as Feasible with an overall weighted mean of 4.00. This implies that the Proposed Inputs to the Quality Assurance System are highly feasible in terms of resource availability, faculty and staff competencies, alignment with academic policies, utilization of existing quality assurance mechanisms, and sustainability within institutional constraints.

This view is affirmed by Yeboah (2024), who emphasized that quality assurance serves as a mechanism for continuous improvement, adaptation, and innovation in higher education institutions. The author explained that effective quality assurance initiatives require aligning institutional policies, resources, curriculum, faculty competence, and operational processes to ensure successful implementation and long-term sustainability. Furthermore, quality assurance measures are considered feasible when they support evidence-based decision-making, address stakeholder needs, and contribute to continuous quality enhancement. Consequently, the high feasibility ratings suggest that the proposed inputs possess the practical, institutional, and operational requirements necessary to support the successful implementation and sustainability of the Quality Assurance System in Hospitality Management education.

PROPOSED INPUTS TO QUALITY ASSURANCE SYSTEM

A proposed Input to the Quality Assurance System was designed and developed to establish a sustainable and comprehensive Quality Assurance System that promotes continuous improvement, academic excellence, effective program implementation, and stakeholder satisfaction in the Hospitality Management Program.

I. Introduction

The proposed Inputs to Quality Assurance System was developed to support the continuous improvement of the Hospitality Management program by addressing the challenges identified in instructional leadership, faculty competence, and curriculum innovation. It serves as a guide in strengthening institutional practices, enhancing instructional effectiveness, and ensuring that academic programs remain responsive to industry standards and educational demands. This proposed system emphasizes the importance of collaboration, professional growth, effective resource management, and continuous monitoring in achieving quality education. Through strategic action plans and targeted interventions, the institution aims to promote a culture of excellence, accountability, and innovation that will contribute to the overall development of both faculty members and students in the Hospitality Management program.

II. Rationale

In the rapidly changing landscape of higher education, maintaining quality in academic programs has become more important than ever. For the Hospitality Management Program, providing quality education goes beyond classroom instruction—it also requires effective leadership, competent faculty, a relevant curriculum, efficient student support services, and strong industry partnerships. As the hospitality industry continues to evolve, institutions must ensure that their programs remain responsive to the needs of students, stakeholders, and the industry itself. The implementation of a proposed Quality Assurance System is essential in promoting continuous improvement and sustaining academic excellence within the program. While the institution consistently strives to deliver quality instruction and services, there are still areas that require enhancement, particularly in instructional supervision, faculty development, assessment practices, technological integration, research engagement, and curriculum innovation. Addressing these concerns through a structured, organized quality assurance system will help ensure consistency, accountability, and effectiveness across all academic and administrative processes.

The Quality Assurance System serves as a guiding framework in monitoring program performance and ensuring compliance with institutional standards, CHED policies, and accreditation requirements. It encourages collaboration among administrators, faculty members, students, industry partners, and other stakeholders in achieving shared educational goals. Through regular evaluation, monitoring, feedback, and evidence-based planning, the institution can identify strengths, address gaps, and implement necessary improvements that will contribute to better learning outcomes and institutional development. This proposed Quality Assurance System aims to cultivate a culture of excellence, innovation, professionalism, and continuous improvement in the Hospitality Management Program. It seeks to strengthen the institution’s commitment to producing competent, globally competitive, and industry-ready graduates while ensuring that academic practices remain relevant, effective, and aligned with the institution's vision and mission.

III. General Objectives

To establish a sustainable and comprehensive Quality Assurance System that promotes continuous improvement, academic excellence, effective program implementation, and stakeholder satisfaction in the Hospitality Management Program.

IV. Specific Objectives

- To improve the quality of instruction, academic supervision, and curriculum implementation within the Hospitality Management Program.
- To strengthen the implementation of Outcomes-Based Education (OBE) through aligned learning outcomes, instructional strategies, and assessment practices.
- To enhance faculty competence through professional development programs, industry exposure, research engagement, and mentoring initiatives.
- To improve assessment, monitoring, evaluation, and feedback mechanisms for effective decision-making and program improvement.
- To promote research, innovation, and extension activities that contribute to academic and professional growth.
- To integrate technology and innovative teaching approaches that support effective and flexible learning experiences.
- To ensure the efficient management, utilization, and maintenance of instructional resources, facilities, and learning materials.
- To encourage collaboration, shared governance, and active stakeholder participation in academic planning and program development.
- To ensure alignment of academic practices and institutional initiatives with the vision, mission, core values, CHED policies, and accreditation standards.
- To strengthen student support services, experiential learning opportunities, and career development programs that will help produce competent and industry-ready graduates.

4. Conclusions and recommendations

Based on the findings of the study, the following conclusions are drawn:. Instructional leadership and faculty competence are manifested in the Hospitality Management Program in selected Higher Education Institutions in Bulacan. The program chairs/coordinators, faculty members, students, and academic evaluators/QA officers have similar assessments regarding instructional leadership and faculty competence in the Hospitality Management Program. Curriculum innovation is observed in the Hospitality Management Program through the integration of outcomes-based education, industry relevance, digital and hybrid learning models, sustainability concepts, research-based curriculum enhancement, and continuous improvement practices. There is a very strong association between instructional leadership and curriculum innovation, as well as between faculty competence and curriculum innovation in the Hospitality Management Program in selected Higher Education Institutions in Bulacan. The challenges relative to instructional leadership, faculty competence, and curriculum innovation are generally experienced by the respondents. The Quality Assurance System was systematically developed based on the identified findings and needs of the institution. The inclusion of key result areas, objectives, strategies, activities, responsible individuals, funding sources, time frames, and performance indicators ensures a comprehensive, structured framework for implementing quality assurance. Thus, the proposed Quality Assurance System provides a practical and responsive guide for continuous improvement, effective monitoring, and the achievement of institutional goals and standards. The proposed inputs to the quality assurance system are viewed by the respondents as appropriate, responsive, and applicable within the Hospitality Management Program.

Based on the findings and conclusions presented, the following recommendations are strongly suggested: Higher Education Institutions offering Hospitality Management programs may continuously strengthen instructional leadership practices through effective communication systems, collaborative governance, and strategic academic planning. Institutions are encouraged to provide continuous faculty development programs focusing on pedagogical enhancement, research capability, technological integration, industry immersion, and professional certification. Hospitality Management programs are highly recommended to continuously review and improve curriculum innovation practices by strengthening Outcomes-Based Education alignment, sustainability integration, digital and hybrid learning models, entrepreneurial competencies, and curriculum benchmarking activities. Administrators and academic leaders are strongly encouraged to invest in leadership capability-building programs, faculty empowerment initiatives, and collaborative academic practices to further strengthen curriculum development and instructional effectiveness within Hospitality Management programs. Institutions are highly recommended to establish sustainable support systems to address the challenges encountered in instructional leadership, faculty competence, and curriculum innovation. The institution may consider adopting and implementing the proposed Quality Assurance System to strengthen quality management practices and support continuous improvement initiatives. The proposed quality assurance inputs may be adopted and pilot-tested by Higher Education Institutions offering Hospitality Management programs. Continuous evaluation, monitoring, and improvement of the proposed quality assurance measures are highly recommended to further support the sustainability, acceptability, feasibility, and effectiveness of efforts to improve program outcomes and institutional performance. Future researchers are encouraged to conduct similar studies in other academic disciplines, institutions, or geographical locations to further validate the findings of the study. Additional variables such as student employability, industry satisfaction, institutional culture, digital transformation, and learning outcomes may also be explored since these factors are closely associated with educational quality, curriculum effectiveness, institutional performance, and the overall responsiveness of Hospitality Management programs to industry and academic demands.

In addition to the general recommendations of the study, the following stakeholder-specific recommendations are proposed: For Program Chairs/Coordinators. Program chairs and coordinators may strengthen instructional leadership practices by enhancing academic planning, faculty supervision, performance monitoring, and collaborative governance mechanisms. They are also encouraged to sustain quality-assurance initiatives and to continuously align program objectives with institutional goals and industry standards. For Faculty Members**.** Faculty members are encouraged to continuously improve their pedagogical competencies, research productivity, technological integration skills, industry engagement, and mentorship practices through active participation in professional development activities, research programs, and industry immersion opportunities For Students. Students may actively participate in curriculum evaluation, feedback mechanisms, and experiential learning activities to support continuous curriculum improvement. Their involvement in quality assurance initiatives may provide valuable insights for enhancing teaching effectiveness and learning experiences. For Academic Evaluators and Quality Assurance Officers. Academic evaluators and quality assurance officers are encouraged to continue providing objective assessment, monitoring, and evaluation of program implementation and quality assurance practices. They may also recommend evidence-based improvements to strengthen instructional leadership, faculty competence, and curriculum innovation. These recommendations are intended to promote collaborative participation among key stakeholders in sustaining educational quality, program effectiveness, and continuous improvement within Hospitality Management programs.

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Influence of location accessibility, investment potential, and financial support on demand for commercial buildings

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Abstract

This study examined the influence of location accessibility, investment potential, and financial support on the demand for commercial buildings. Specifically, it assessed location accessibility in terms of proximity to transportation, accessibility to business centers, and availability of supporting infrastructure. It also evaluated investment potential in terms of expected return on investment, property value appreciation, and income-generating capability. In addition, the study determined the level of financial support available to buyers in terms of access to commercial or business loans, affordability of financing options, and availability of financial assistance programs. The level of demand for commercial buildings was measured in terms of purchase intention, leasing intention, and investment interest. The study further examined the significant influence of location accessibility, investment potential, and financial support on demand for commercial buildings. A descriptive-correlational research design was employed, and data were gathered using a structured questionnaire administered to 384 relevant respondents. Statistical tools were used to analyze the level of variables, test relationships, and determine the extent of influence of the predictors on demand. Findings of the study are expected to provide empirical evidence on the key factors that drive demand for commercial buildings. Based on the results, an action plan is proposed to enhance demand by improving location accessibility, strengthening investment attractiveness, and expanding financial support mechanisms for potential buyers and investors.

Keywords: location accessibility, investment potential, financial support on demand for commercial buildings

Influence of location accessibility, investment potential, and financial support on demand for commercial buildings

1. Introduction

Recent consumer-driven real estate research identifies five principal factors that shape property price decisions: physical condition, design concept, marketing, location accessibility, and location uniqueness (Rahadi et al., 2023). Among these factors, location accessibility is the most significant, accounting for approximately 34.32% of the influence on property prices (Rahadi et al., 2023). Within this framework, design concepts such as architectural style and amenities reflect user preferences and influence willingness to pay, while ease of access to transportation and facilities shapes perceived location uniqueness (Rahadi et al.,2023). Location-related features—including direct access to toll roads and proximity to activity centers, shopping malls, and education centers—further reinforce the locational attribute of property purchase decisions (Rahadi et al., 2023). Infrastructure-related features, including façades, electricity reliability, water supply, and product specifications, also influence consumer perception of property prices (Rahadi et al., 2023).

From the investor perspective, real estate is an asset class that requires intensive management across the entire life cycle of the investment, encompassing technical management, leasing activities, transactions, and the strategic management of the property portfolio (Autio et al.,2023). Recent work on Investor Real Estate Management has identified eight strategic themes on which real estate investors base their strategies: innovation, ESG, marketing and sales, financial management, leasing management and tenant satisfaction, competitive environment and portfolio management, outsourcing and strategic partnerships, and cost and operation optimization. The IREM framework links these themes to three strategic goals—profitability growth, revenue growth, and future growth—providing a systemic basis for investors to develop or evaluate their strategies (Autio et al., 2023). The integration of the consumer-driven factors framework and the IREM strategic themes justifies treating commercial buildings as a unified investment thesis rather than as fragmented sub-markets.

Demand for commercial buildings in this study is shaped by three interrelated factors: Location accessibility is the most decisive determinant of property purchase decisions in the consumer-driven framework, with locational features such as transportation proximity, access to activity centers, and unique location attributes collectively shaping the perceived value of a commercial building. Infrastructure-related features—electricity, water, parking, and product specifications—further supplement this locational premium (Rahadi et al., 2023). Investment Potential is operationalized through the IREM strategic themes, with real estate investors pursuing profitability growth, revenue growth, and future growth by coordinating financial management, leasing management, and portfolio strategies (Autio et al.,2023). Real estate investment is structured to create competitive advantages that respond to investor expectations, with strategic emphasis on long-horizon holding rather than speculative short-term transactions. Financial Support lowers entry barriers for prospective commercial property investors. The IREM framework specifies financial management as one of the eight strategic themes, underscoring the foundational role of financial structures in commercial real estate transactions (Autio et al.,2023). Financial support mechanisms—including access to credit, deposit services, and government assistance programs—provide the conditions under which investor strategy translates into commercial property acquisition.

At the Thai national level, Bangkok remained the most popular province for property purchases in 2022, followed by its surrounding provinces of Nonthaburi, Samut Prakan, Pathum Thani, and Chonburi. Thai consumers prioritize residences near public transportation, and overall project location is weighted nearly as highly, reflecting the structural importance of access in property decisions. The Bank of Thailand's relaxation of mortgage loan controls (Loan-to-Value: LTV), ending in 2022, and the expansion of the electric train network have spread housing demand outward from the capital, elevating surrounding provinces such as Pathum Thani.

Against this backdrop, this study examines the influence of Location Accessibility, Investment Potential, and Financial Support on the demand for purchasing commercial buildings for residential and business use in Pathum Thani Province. The findings are expected to inform the entrepreneurial marketing of commercial buildings, contribute to the literature on real estate entrepreneurship and demand, and offer practical public relations strategies for presenting residential and commercial properties to consumers in this province.

Objectives of the Study - This study aims to determine the influence of location accessibility, investment potential, and financial support on the demand for commercial buildings. Specifically, to assess the level of location accessibility in terms of: proximity to transportation, accessibility to business centers, availability of supporting infrastructure; evaluate the level of investment potential of commercial buildings in terms of: expected return on investment, property value appreciation, income-generating capability; determine the level of financial support available to buyers in terms of: access to commercial or business loans, affordability of financing options, availability of financial assistance programs; assess the level of demand for commercial buildings in terms of purchase intention; leasing intention; and investment interest; Examine the significant influence of location accessibility, investment potential, and financial support on demand for commercial buildings; determine the predictors on demand for commercial buildings; and propose a framework to improve demand for commercial buildings.

2. Methods

Research Design - This study employs descriptive-correlational design. The quantitative approach is selected because the research problem requires the measurement of relationships among a defined set of variables and the prediction of an outcome variable from a set of explanatory variables, which is operationalized through standardized survey instruments and statistical testing (Rahadi et al., 2023). The design is descriptive-correlational with a predictive (multiple regression) component, enabling the study to describe respondent perceptions across each construct, test the strength and direction of pairwise relationships among constructs, and identify which predictors best explain demand for commercial buildings. A descriptive-correlational design is appropriate for this study because it allows the researcher to measure, describe, and quantify the extent to which variations in Location Accessibility, Investment Potential, and Financial Support are associated with variations in Demand for Commercial Buildings, without manipulating any variable (Rahadi et al., 2023). The predictive component extends the descriptive analysis by isolating the unique contribution of each predictor to demand, supporting the research objective of identifying the most influential drivers.

Participants of the Study - The population of the study comprises current and prospective consumers of commercial buildings in Pathum Thani Province who are actively engaged in or evaluating property decisions. A stratified purposive sampling approach is applied to ensure that respondents include individuals across the three demand sub-dimensions, capturing each pathway through which commercial building demand is expressed. The sample size follows the convention that multiple regression analyses require a minimum of 10 to 15 respondents per predictor. Given that the regression model incorporates nine sub-dimension predictors, a minimum of 135 respondents is technically sufficient. To strengthen statistical power and accommodate incomplete responses, the study adopts a target of 384 respondents, which yields a residual degrees-of-freedom figure appropriate for high-power regression testing using Cochran formula.

Data Gathering Instruments - A structured questionnaire serves as the primary data-collection instrument, using a four-point Likert scale to measure respondent agreement with each indicator. The scale anchors are interpreted as: 3.50–4.00; 2.50–3.49; 1.50–2.29; and 1.00–1.49. The use of a four-point scale forces directional responses and avoids the central-tendency bias associated with five- or seven-point scales, improving the discriminating power of the item set. The questionnaire is organized into four parts. Part I captures respondent profile information including gender, age, occupation, and current property involvement. Part II contains 15 indicators measuring Location Accessibility across its three sub-dimensions. Part III contains 15 indicators measuring Investment Potential across its three sub-dimensions. Part IV contains 15 indicators measuring

Financial Support across its three sub-dimensions. Part V contains 15 indicators measuring Demand for Commercial Buildings across its three sub-dimensions. The instrument was validated through content review by subject-matter experts, and reliability is established using Cronbach's alpha, with the accepted threshold of $\alpha \geq 0.70$ applied across all constructs.

Data Gathering Procedure - Data collection proceeds in three phases. The preparation phase includes questionnaire reproduction, enumerator briefing, and coordination with local contact points in Pathum Thani Province. The distribution phase administers the questionnaire to respondents, with responses captured through printed surveys and, where appropriate, digital equivalents. The retrieval phase involves the collection of completed questionnaires, encoding of responses, and quality screening for incomplete or inconsistent submissions

Data Analysis - The data are processed using statistical software that supports descriptive statistics, correlation analysis, and multiple regression. Weighted mean and verbal interpretation are computed for each indicator and each sub-dimension to describe respondent perceptions across constructs. The four-point Likert-scale legend provides the verbal-interpretation band used throughout the descriptive tables. Spearman rank-order correlation is used to test the strength and direction of relationships between construct pairs and sub-dimension pairs. Spearman's rho is selected because the data are ordinally scaled and because the study focuses on rank-order relationships rather than on parametric linear assumptions. Multiple regression analysis is used to identify which combination of sub-dimension predictors best explains variance in Demand for Commercial Buildings. The model reports R, R^2, adjusted R^2, and the F-test of overall significance, with standardized coefficients (β) used to compare the relative influence of each predictor. The significance level is set at $p < 0.05$ for all inferential tests. Correlations with $p < 0.05$ are interpreted as statistically significant.

Ethical Considerations - This study adhered to established research ethics principles to protect the rights and welfare of all participants. Informed consent was obtained after participants were informed of the study's purpose, procedures, and potential risks and benefits. Participation was voluntary, and respondents could withdraw at any time without penalty. All collected data were kept confidential, anonymized, and securely stored, with access limited to the researcher and authorized personnel. The study also complied with applicable data protection regulations and the ethical guidelines of relevant institutional review boards or ethics committees to ensure the privacy, confidentiality, and welfare of all participants throughout the research process.

3. Result and discussion

Table 1

Summary table of location accessibility

Indicators	Weighted Mean	Verbal Interpretation	Rank
Proximity to Transportation	3.3	Agree	2
Accessibility to Business Centers	3.18	Agree	3
Availability of Supporting Infrastructure	3.31	Agree	1
OVERALL MEAN	3.26	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

Table 1 consolidates the three sub-dimensions into their composite means, ranks, and overall Location Accessibility score. Availability of Supporting Infrastructure ranked first at 3.31. The narrow 0.01-point margin over Proximity to Transportation (3.30) signals that respondents view infrastructure and transportation as nearly co-equal drivers of locational value. Chen et al. (2017) confirmed that infrastructure and transportation variables co-dominate spatial real estate models, frequently registering the highest standardized coefficients among location dimensions. Accessibility to Business Centers ranked third at 3.18. This implies that respondents view proximity to concentration points as a softer preference, while functional accessibility (infrastructure + transport) carries stronger weight. Aliyu et al. (2018) noted that transportation-infrastructure bundles yield higher explanatory power than destination proximity in hedonic models.

The Location Accessibility score of 3.26 confirms that respondents positively affirm the importance of accessible commercial locations. The narrow spread (3.18–3.31) among sub-dimensions indicates a balanced preference structure: respondents value location across multiple dimensions without strongly discriminating between them. Owen et al. (2015) characterized such balanced preference structures as typical of commercial respondents who integrate spatial and infrastructural variables into a unified accessibility framework.

Table 2

Summary table of investment potential

Indicators	Weighted Mean	Verbal Interpretation	Rank
Expected Return on Investment	3.29	Agree	1
Property Value Appreciation	3.23	Agree	2.5
Income-Generating Capability	3.23	Agree	2.5
OVERALL MEAN	3.25	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

Table 2 consolidates the three Investment Potential sub-dimensions. Property Value Appreciation and Income-Generating Capability tie at 3.23. This tied reading indicates respondents view these sub-dimensions as complementary — appreciation converts into income potential, and income cash flows underwrite appreciation. Autio et al. (2023) confirmed in their strategy framework that income and appreciation dimensions are operationally inseparable for commercial real estate investors. Expected Return on Investment ranked first at 3.29, marginally ahead of the other two sub-dimensions. Rahadi et al. (2023) noted that consumer behavior and macroeconomic factor assessments elevate ROI expectations as the dominant framing of investment potential composite Investment Potential score of 3.25 indicates respondents consistently recognize commercial property as an investment vehicle. The narrow 0.06-point spread across sub-dimensions confirms that all three pillars (return, appreciation, income) are perceived as essential and balanced planks of the investment thesis.

Table 3

Summary table of financial support

Indicators	Weighted Mean	Verbal Interpretation	Rank
Access to Commercial or Business Loans	3.23	Agree	2
Affordability of Financing Options	3.11	Agree	3
Availability of Financial Assistance Programs	3.25	Agree	1
OVERALL MEAN	3.2	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

Table 3 consolidates the three Financial Support sub-dimensions into composite means, ranks, and an overall Financial Support score. The 3.20 composite score for Financial Support overall lies between Location Accessibility (3.26) and Investment Potential (3.25) in the construct-level ranking. This means respondents recognize financial support as an important dimension of commercial real estate demand, but it is not the dominant driver. Plazzi et al. (2010) confirmed that financial-support variables in commercial property models register moderate to high coefficients, but their composite role is supportively auxiliary rather than primary. The highest dimension is Availability of Financial Assistance Programs ranked first at 3.25. The 0.02–0.14-point spread across the three sub-dimensions signals a relatively balanced Financial Support construct: respondents value assistance programs slightly more than direct loan access, and both are valued more than affordability-anchored considerations. Zekarias (2025) confirmed that assistance-program mechanisms outperform direct loan and affordability mechanisms in emerging-market rental studies, especially when assistance is provisioned through both fiscal and quasi-fiscal instruments. The lowest dimension is Affordability of Financing Options ranked third at 3.11. The 0.14-point gap below the rank 1 sub-dimension confirms respondents' cautious framing of affordability, a pattern consistent with the lowest composite. The user's correlation matrix also reveals that affordability has the lowest correlation with Leasing Intention ($\rho = 0.680$) relative to loan access and assistance programs, validating the construct-level under-performance of affordability as a driver of commercial real estate demand.

Table 4 summarizes the three sub-dimensions of demand for commercial buildings — Purchase Intention, Leasing Intention, and Investment Interest — along with their weighted means, verbal interpretations, and ranks. The overall weighted mean of 3.25, interpreted as *Agree*, confirms that respondents exhibit a strongly positive demand for commercial buildings across all three engagement modes. With all three sub-dimensions registering above 3.10, demand is consistently distributed across ownership, leasing, and general investment interest. Autio et al. (2023), noted that real estate demand operates through multiple entry pathways (ownership, leasing, and indirect investment), and the composite demand score reflects the integration of these channels, it further emphasized that consumer behavior and macroeconomic factors jointly amplify demand for commercial real estate, with the composite demand index reflecting a confluence of behavioral and structural drivers.

Table 4

Summary table of demand for commercial buildings

Indicators	Weighted Mean	Verbal Interpretation	Rank
Purchase Intention	3.34	Agree	1
Leasing Intention	3.25	Agree	2
Investment Interest	3.16	Agree	3
OVERALL MEAN	3.25	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

The highest indicator is Purchase Intention emerged as the top-ranked sub-dimension with a weighted mean of 3.34 implying that respondents are most decisively aligned with ownership of commercial buildings as the preferred mode of engagement. This reflects the long-horizon investment psychology underlying commercial real estate, where capital appreciation and direct control over the asset take precedence over lease flexibility. Autio et al. (2023), established that investor strategy frameworks consistently prioritize ownership in core and value-add strategies because ownership enables direct control, equity capture, and long-horizon value and demonstrated that expected returns, cap rates, and rent growth predictability are operationally meaningful primarily through ownership structures, reinforcing why purchase intention drives the aggregate demand score.

Leasing Intention (3.25) ranked second, while Investment Interest (3.16) ranked third. The relatively narrow 0.18-point spread between the highest and lowest sub-dimensions suggests that respondents maintain parallel interest across all three channels. Investment Interest produced a mean of 3.16, the weakest of the three sub-dimensions. This implies that respondents' general exploration interest is weaker than their *concrete* intention to purchase or lease. The gap between rank 1 and rank 3 reflects a typical attitude-behavior hierarchy: specific behavioral intentions overweight generalized exploratory interest. Respondents are committed to action when conditions are right but do not constantly scan the market. Alaka et al. (2016), observed that construction business decision-making integrates intention more tightly than exploration behavior, with investors narrowing cognitive effort once a decision framework is established.

Table 5 presents the Relationship Between Location Accessibility and Investment Potential. Spearman rank-order correlations between the three sub-dimensions of Location Accessibility and the three sub-dimensions of Investment Potential were all statistically significant at p=0.000. The Strongest Overall Correlation (Location Accessibility vs. Investment Potential overall, ρ=0.894). The strongest relationship is between Location Accessibility and Investment Potential overall, with Spearman-rho = 0.894. This implies that respondents who perceive locations as highly accessible also perceive commercial properties as having strong investment potential. The very strong positive correlation indicates that location and investment value are not separable in respondents' minds — accessible locations are investment-ready properties. Chen et al. (2017) demonstrated that proximity to transportation infrastructure produces consistent and strong property value uplifts in spatial hedonic models, confirming the locational premium attached to transit-adjacent properties. Plazzi et al. (2010), established that expected returns and rent growth predictors align systematically with locational quality.

Table 5

Relationship between location accessibility and investment potential

Proximity to Transportation	Spearman-rho	p-value	Interpretation
Expected Return on Investment	.776**	0	Significant
Property Value Appreciation	.757**	0	Significant
Income-Generating Capability	.764**	0	Significant
Investment Potential OVERALL	.810**	0	Significant

Accessibility to Business Centers			
Expected Return on Investment	.722**	0	Significant
Property Value Appreciation	.535**	0	Significant
Income-Generating Capability	.700**	0	Significant
Investment Potential OVERALL	.738**	0	Significant
Availability of Supporting Infrastructure			
Expected Return on Investment	.631**	0	Significant
Property Value Appreciation	.861**	0	Significant
Income-Generating Capability	.882**	0	Significant
Investment Potential OVERALL	.828**	0	Significant
Location Accessibility			
Expected Return on Investment	.768**	0	Significant
Property Value Appreciation	.825**	0	Significant
Income-Generating Capability	.889**	0	Significant
Investment Potential OVERALL	.894**	0	Significant

Among all sub-dimension pairs, the strongest correlation is between Availability of Supporting Infrastructure and Income-Generating Capability (ρ=0.882). This implies that investors strongly associate infrastructure availability (electricity, water, parking, internet) with a property's ability to generate stable income. Infrastructure thus directly underwrites the income thesis of commercial real estate. Zekarias (2025) demonstrated that infrastructure investment affects rental appreciation and business performance, driving income-generating capability. Makata et al. (2015) empirically confirmed that infrastructure improvements explain a major share of rental value variation and occupancy.

Weakest Significant Correlation (Accessibility to Business Centers vs. Property Value Appreciation, ρ = 0.535). The weakest significant correlation in Table 5 is between Accessibility to Business Centers and Property Value Appreciation (ρ = 0.535). Although still significant, this moderate correlation implies that investors do not as strongly associate business district adjacency with future property value increases. Kivilahti et al. (2007) noted that location preferences for central business districts are heterogeneous, with appreciation tied more to development momentum than to CBD adjacency.

Table 6
Relationship between location accessibility and financial support

Proximity to Transportation	Spearman-rho	p-value	Interpretation
Access to Commercial or Business Loans	.519**	0	Significant
Affordability of Financing Options	.516**	0	Significant
Availability of Financial Assistance Programs	.826**	0	Significant
Financial Support OVERALL	.680**	0	Significant
Accessibility to Business Centers			
Access to Commercial or Business Loans	.665**	0	Significant
Affordability of Financing Options	.485**	0	Significant
Availability of Financial Assistance Programs	.610**	0	Significant
Financial Support OVERALL	.627**	0	Significant
Availability of Supporting Infrastructure			
Access to Commercial or Business Loans	.722**	0	Significant
Affordability of Financing Options	.820**	0	Significant
Availability of Financial Assistance Programs	.807**	0	Significant
Financial Support OVERALL	.878**	0	Significant
Location Accessibility			
Access to Commercial or Business Loans	.711**	0	Significant
Affordability of Financing Options	.726**	0	Significant
Availability of Financial Assistance Programs	.837**	0	Significant
Financial Support OVERALL	.834**	0	Significant

The model yielded R = 0.977, R^2 = 0.955, and Adjusted R^2 = 0.954, with F = 885.899, p = 0.000. This implies that 95.5% of the variance in Demand for Commercial Buildings is explained by the combined set of nine predictor variables. Chen et al. (2017) demonstrated that spatial and financial predictors integrated into a single regression framework yield Adjusted R^2 values surpassing 0.95. Alaka et al. (2016) confirmed that domain-specific.

Table 7

Relationship between location accessibility and demand for commercial buildings

Proximity to Transportation	Spearman-rho	p-value	Interpretation
Purchase Intention	.741**	0	Significant
Leasing Intention	.446**	0	Significant
Investment Interest	.559**	0	Significant
Demand for Commercial Buildings OVERALL	.683**	0	Significant
Accessibility to Business Centers			
Purchase Intention	.860**	0	Significant
Leasing Intention	.560**	0	Significant
Investment Interest	.607**	0	Significant
Demand for Commercial Buildings OVERALL	.802**	0	Significant
Availability of Supporting Infrastructure			
Purchase Intention	.672**	0	Significant
Leasing Intention	.742**	0	Significant
Investment Interest	.862**	0	Significant
Demand for Commercial Buildings OVERALL	.854**	0	Significant
Location Accessibility			
Purchase Intention	.855**	0	Significant
Leasing Intention	.679**	0	Significant
Investment Interest	.796**	0	Significant
Demand for Commercial Buildings OVERALL	.897**	0	Significant

Table 8 presents the Relationship Between Investment Potential and Financial Support. All correlations between Investment Potential and Financial Support sub-dimensions were statistically significant at $p = 0.000$. Strongest Overall Correlation (Investment Potential vs. Financial Support overall, $\rho = 0.858$). Plazzi et al. (2010), confirmed that expected return dynamics, rent growth, and cap rates operate in tandem with credit and assistance instruments. Zekarias (2025) demonstrated empirically that public infrastructure combined with financial assistance programs produces significant mediation effects on rental values. The Strongest Sub-Dimension Pair (Income-Generating Capability vs. Financial Assistance Programs, $\rho = 0.929$). The strongest sub-dimension pair is Income-Generating Capability and Availability of Financial Assistance Programs ($\rho = 0.929$). This exceptionally strong correlation implies that the income-generating profile of a commercial property is the most decisive factor in determining program availability. Alaka et al. (2016) noted that financial support instruments are deployed on the basis of project viability scoring. Zekarias (2025), confirmed that assistance programs require clear income or revenue theses to qualify.

The weakest correlation is between Expected Return on Investment and Affordability of Financing Options ($\rho = 0.403$). This moderate correlation implies that respondents do not strongly tie ROI expectations to financing affordability. Investors typically evaluate ROI before financing — the projected return drives the financing decision rather than the reverse. Autio et al. (2023) indicated that investment strategies first identify yield targets before considering financing options. Plazzi et al. (2010), confirmed that expected return dynamics operate largely independently of financing cost mechanisms.

Table 8

Relationship Between Investment Potential and Financial Support

Expected Return on Investment	Spearman-rho	p-value	Interpretation
Access to Commercial or Business Loans	.631**	0	Significant
Affordability of Financing Options	.403**	0	Significant
Availability of Financial Assistance Programs	.790**	0	Significant
Financial Support OVERALL	.673**	0	Significant
Property Value Appreciation			
Access to Commercial or Business Loans	.723**	0	Significant
Affordability of Financing Options	.823**	0	Significant
Availability of Financial Assistance Programs	.805**	0	Significant
Financial Support OVERALL	.889**	0	Significant
Income-Generating Capability			
Access to Commercial or Business Loans	.675**	0	Significant
Affordability of Financing Options	.732**	0	Significant
Availability of Financial Assistance Programs	.929**	0	Significant
Financial Support OVERALL	.849**	0	Significant

Investment Potential			
Access to Commercial or Business Loans	.706**	0	Significant
Affordability of Financing Options	.712**	0	Significant
Availability of Financial Assistance Programs	.912**	0	Significant
Financial Support OVERALL	.858**	0	Significant

Table 9 presents Relationship Between Investment Potential and Demand for Commercial Buildings. The strongest relationship is between Investment Potential and Demand for Commercial Buildings overall (ρ = 0.836). This very strong positive correlation implies that respondents who perceive commercial properties as having high investment potential also report substantially higher demand. Autio et al. (2023), established that investment potential dimensions converge into a unified investor decision framework, translating directly into demand formation. Plazzi et al. (2010), demonstrated that expected return dynamics, rent growth, and cap rates jointly determine commercial real estate pricing and demand.

Table 9
Relationship between investment potential and demand for commercial buildings

Expected Return on Investment	Spearman-rho	p-value	Interpretation
Purchase Intention	.856**	0	Significant
Leasing Intention	.465**	0	Significant
Investment Interest	.491**	0	Significant
Demand for Commercial Buildings OVERALL	.725**	0	Significant
Property Value Appreciation			
Purchase Intention	.572**	0	Significant
Leasing Intention	.665**	0	Significant
Investment Interest	.808**	0	Significant
Demand for Commercial Buildings OVERALL	.782**	0	Significant
Income-Generating Capability			
Purchase Intention	.730**	0	Significant
Leasing Intention	.621**	0	Significant
Investment Interest	.723**	0	Significant
Demand for Commercial Buildings OVERALL	.816**	0	Significant
Investment Potential			
Purchase Intention	.805**	0	Significant
Leasing Intention	.615**	0	Significant
Investment Interest	.718**	0	Significant
Demand for Commercial Buildings OVERALL	.836**	0	Significant

The strongest sub-dimension pair is Expected Return on Investment and Purchase Intention (ρ = 0.856). This exceptionally strong correlation implies that respondents who anticipate strong returns are overwhelmingly inclined to act on that expectation by purchasing property. Expected return functions as a trigger mechanism that converts information into purchase commitment. Autio et al. (2023), observed that projected returns translate most directly into acquisition decisions. Rahadi et al. (2023), noted that consumer behavior and macroeconomic expectations jointly shape purchase decisions, making ROI expectations the leading activator for high-commitment decisions in commercial property. The weakest correlation is between Expected Return on Investment and Leasing Intention (ρ = 0.465). Leasing is fundamentally a non-ownership engagement form, so return-on-investment metrics are less relevant when respondents evaluate leasing decisions. Büchler et al. (2020), found that redevelopment-driven value premiums apply to owned properties rather than leased ones.

Table 10
Relationship between financial support and demand for commercial buildings

Access to Commercial or Business Loans	Spearman-rho	p-value	Interpretation
Purchase Intention	.645**	0	Significant
Leasing Intention	.905**	0	Significant
Investment Interest	.772**	0	Significant
Demand for Commercial Buildings OVERALL	.901**	0	Significant
Affordability of Financing Options			
Purchase Intention	.506**	0	Significant
Leasing Intention	.680**	0	Significant
Investment Interest	.890**	0	Significant
Demand for Commercial Buildings OVERALL	.752**	0	Significant

Availability of Financial Assistance Programs			
Purchase Intention	.653**	0	Significant
Leasing Intention	.499**	0	Significant
Investment Interest	.626**	0	Significant
Demand for Commercial Buildings OVERALL	.706**	0	Significant
Financial Support			
Purchase Intention	.666**	0	Significant
Leasing Intention	.822**	0	Significant
Investment Interest	.879**	0	Significant
Demand for Commercial Buildings OVERALL	.902**	0	Significant

Table 10 presents the relationship between financial support and demand for commercial buildings. The strongest relationship is between Financial Support and Demand for Commercial Buildings overall (ρ = 0.902). This very strong positive correlation implies that respondents who recognize the presence of robust financial support mechanisms report substantially higher demand. This 0.902 coefficient is the strongest single-domain correlate in the entire correlation matrix. Alaka et al. (2016) maintained that financial support infrastructure is foundational for commercial property demand. Zekarias (2025) demonstrated empirically that public infrastructure and financial assistance programs produce significant mediation effects on rental values.

The strongest sub-dimension pair is Access to Commercial or Business Loans and Leasing Intention (ρ = 0.905). Leasing requires operating capital, and without loan access, prospective tenants cannot finance their leasing operations. Alaka et al. (2016) confirmed that access to commercial loans is essential for business survival and expansion, with loan-constrained businesses unable to enter into lease commitments. Makata et al. (2015) observed that financial infrastructure and accessibility jointly affect rental values. Affordability of Financing Options and Investment Interest yielded ρ=0.890. When financing is affordable, investors are more willing to explore commercial properties, even without immediate commitment. Alaka et al. (2016) noted that affordable financing options enable exploratory investment behavior.

The weakest correlation is between Availability of Financial Assistance Programs and Leasing Intention (ρ = 0.499). The 0.499 strength is far below the 0.905 reading for loan access versus leasing, signaling that assistance programs are not the primary funding instrument for leasing, which is funded through conventional loans and operating revenues (Alaka et al., 2016; Zekarias, 2025).

Research Output

The proposed framework positions Location Accessibility, Investment Potential, and Financial Support as three interrelated independent variables that collectively drive Demand for Commercial Buildings in Pathum Thani Province. The diagram encodes two distinct types of relationships. The bidirectional arrows between the three independent variables indicate that the predictors are conceptually correlated with one another rather than statistically independent. The directional arrows from each independent variable to the dependent variable indicate the proposed causal influence of each predictor on demand. The framework is anchored on the consumer-driven real estate pricing literature, which identifies Location Accessibility as the single most decisive attribute shaping property-buying behavior, and on the Investor Real Estate Management strategic-management framework, which identifies the strategic themes through which Financial Support and Investment Potential translate into investor decisions.

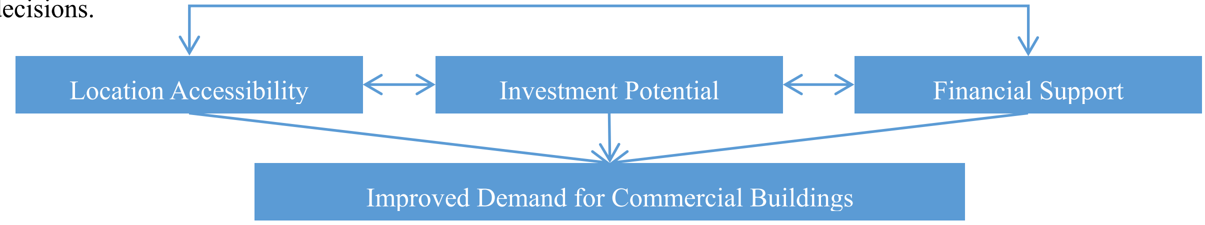

Figure 1. Proposed Framework to Improve Demand for Commercial Buildings

4. Conclusions and recommendations

The respondents moderately agreed on location accessibility particularly due to the availability of supporting infrastructure and convenient transportation access. The respondents generally agree regarding the investment potential of the property particularly in terms of expected return on investment, property value appreciation, and income-generating capability. The respondents generally agree on the financial support given in terms of access to commercial or business loans, affordability of financing options, availability of financial assistance programs. There is moderate demand for commercial buildings in terms of purchase intention; leasing intention; and investment interest. There is significant relationship among location accessibility, investment potential, and financial support on demand for commercial buildings. Location accessibility, investment potential, and financial support at significant predictors on demand for commercial buildings. A framework is proposed to improve demand for commercial buildings in Thailand

Property developers and local government units may prioritize the improvement of transportation networks, accessibility to business centers, and supporting infrastructure, as these factors were found to be strongly associated with investment potential, financial support, and demand for commercial buildings. Financial institutions and government agencies may enhance access to commercial loans, improve the affordability of financing options, and increase the availability of financial assistance programs to encourage greater participation in the commercial property market. Collaboration among property developers, financial institutions, investors, and government agencies should be strengthened to create an enabling environment that supports commercial building development and stimulates market demand. The proposed framework may be presented to the property developers to improve demand for commercial buildings. Future researchers may examine additional factors influencing the demand for commercial buildings, such as economic conditions, market competitiveness, government regulations, urbanization trends, and consumer preferences.

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Economic benefits, environmental awareness, and charging infrastructure as determinants of electric vehicle adoption in Bangkok

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Abstract

This study examined how perceived economic benefits, environmental awareness, and charging infrastructure influence consumer adoption of electric vehicles (EVs) in Bangkok, Thailand. It also described respondents' demographic profiles, assessed the levels of these factors and EV adoption, tested differences in adoption across demographic groups, explored relationships among variables, and generated recommendations for EV entrepreneurs, policymakers, and prospective business operators. Data were collected through a survey of 400 EV consumers in Bangkok and analyzed using the Statistical Package for the Social Sciences (SPSS), including t-tests, ANOVA, and Pearson correlation analysis. Most respondents were male (62%), aged 30–35 years (44%), held a bachelor's degree (58%), and were employees. Findings showed that consumer adoption of EVs differed significantly by gender, educational attainment, occupation, and monthly income at the 0.05 significance level. Pearson correlation results revealed positive, moderate, and statistically significant relationships between EV adoption and perceived economic benefits ($r = .345$, $p < .01$), environmental awareness ($r = .264$, $p < .01$), and charging infrastructure ($r = .384$, $p < .01$). Overall, better economic advantages, stronger environmental awareness, and more accessible charging infrastructure were associated with higher consumer adoption of electric vehicles in Bangkok. These results suggest that improving charging networks, emphasizing long-term cost savings, and increasing public awareness of environmental benefits may encourage broader EV adoption, while businesses can use the findings to refine marketing strategies and policymakers can design programs that support sustainable transportation and future investment decisions across diverse demographic groups and strengthen consumer confidence in emerging electric mobility initiatives.

Keywords: consumer adoption, electric vehicles, environment awareness, charging infrastructure

Economic benefits, environmental awareness, and charging infrastructure as determinants of electric vehicle adoption in Bangkok

1. Introduction

Rising fuel prices and growing environmental concerns have encouraged the Thai government to promote the adoption of Electric Vehicles (EVs) as a cleaner and more sustainable mode of transportation. EVs produce fewer greenhouse gas emissions than conventional gasoline or diesel vehicles and are expected to improve urban air quality (Pornthip, 2022). Thailand's EV market has expanded rapidly due to government incentives, advances in battery technology, increasing consumer demand, and the entry of new manufacturers such as Tesla and Chinese automotive brands (Federation of Thai Industries, 2022, cited in Supreecha, 2022). EV registrations increased substantially from 9,729 units in 2022 to 76,314 in 2023 before slightly declining to 70,173 units in 2024 (Autolifethailand, 2025). These trends indicate continued growth despite market fluctuations.

Previous studies suggest that perceived economic benefits, environmental awareness, and charging infrastructure are among the key factors influencing EV adoption. Consumers recognize the long-term cost savings of EVs despite their higher purchase price (Manisorn, 2022). Environmental awareness also motivates consumers, as EVs help reduce emissions and support sustainable transportation. Meanwhile, government incentives and the expansion of charging infrastructure further encourage EV adoption, although infrastructure availability remains a challenge in some areas (Supreecha, 2022). Guided by the Technology Acceptance Model (Davis), this study examines how perceived economic benefits, environmental awareness, and charging infrastructure influence consumer adoption of EVs in Bangkok, Thailand. The findings are expected to provide valuable insights for policymakers and EV entrepreneurs in developing effective strategies to promote EV adoption and support the sustainable growth of Thailand's electric vehicle industry.

Objectives of the Study - This study examined the influence of perceived economic benefits, environmental awareness, and charging infrastructure on consumer adoption of electric vehicles (EVs) in Bangkok, Thailand. Specifically, it aims to assess the level of perceived economic benefits of electronic vehicles in terms of: Cost Efficiency, Performance & Functionality, and Social & Psychological Value; determine the level of environmental awareness among consumers in terms of :Pollution Reduction & Environmental Friendliness; Clean Energy Advocacy; Social & Community Environmental Support; determine the consumer perception on charging infrastructure in terms of: availability and accessibility, convenience and ease of use, economic feasibility, and government and private sector support; assess the perceived economic benefits, environmental awareness and charging infrastructure on consumer adoption of Electric Vehicles in terms of adoption intention, perceived value and reasonableness, and innovativeness and curiosity; test the significant relationships among perceived economic benefits, environmental awareness, and charging infrastructure, and consumer adoption of electric vehicles; identify which determinant significantly predicts electric vehicle adoption; and propose Strategic Action Plan for Improving Consumer Adoption of Electric Vehicles in Bangkok, Thailand.

2. Methods

Research Design - The researcher used a research design using quantitative research to assess, analyze, and evaluate the answers of the questionnaire in a way that would provide evidence and reasonable conclusions to the researcher about the conditions and some phenomena of consumer adoption Personal characteristics, Exploring the impact of perceived economic benefit, Environmental awareness, and charging infrastructure factors, and factors effecting on consumer adoption of Electric Vehicles in Bangkok, Thailand.

Participants of the Study - The target population for this study comprises of 384 consumers of Electric Vehicles in Bangkok, Thailand. A purposive sampling technique will be employed to select the sample, which means that participants will be chosen based on their relevance to the research objectives and their ability to provide valuable insights (Hair Jr. et al., 2017).

Data Gathering Instruments - The survey questionnaire was pre-tested with a small group of consumers' adoption of Electric Vehicles to ensure clarity and validity of the questions. Necessary adjustments will be made based on the feedback received. The final questionnaire will then be distributed to the target sample of consumer adoption of Electric Vehicles in Bangkok. Various methods, such as approaching selling center firms directly, leveraging professional networks and associations, and utilizing online platforms, can be used to reach the sample. To enhance the response rate, an incentive scheme or reward system may be implemented, and confidentiality and anonymity will be ensured to promote honest and unbiased responses. Once the data collection is complete, statistical analysis techniques will be utilized to analyze the relationships between personal characteristics, consumer adoption of Electric Vehicles-related factors. The analysis will provide insights into the factors influencing entrepreneurial success in the Electric Vehicles industry in Bangkok, Thailand.

Data Gathering Procedure - The data collection method used in this study is a survey questionnaire The survey questionnaire will consist of closed-ended questions, which will be used to collect data on the personal characteristics of consumers of Electric Vehicles, and related factors, the impact of perceived economic benefits factors, environment awareness, and consumer of Electric Vehicles in Bangkok, Thailand (Siriwan et al.,2020; Supreecha, 2022). The questionnaire will be designed based on relevant literature and theoretical frameworks, incorporating constructs and dimensions identified in previous studies (Nguyen et al.,2021). It will draw inspiration from studies that have examined personal characteristics, related factors, and consumers of Electric Vehicles in Bangkok, Thailand, in various contexts (Nguyen et al.,2021).

The questionnaire will comprise 4 sections addressing various aspects of the study, Economic Benefits, Environmental Awareness, and Charging Infrastructure and Vehicle Adoption. Furthermore, the findings from the data analysis can be used to generate practical recommendations and implications for entrepreneurs, consumer adoption of Electric Vehicles, policymakers, and other stakeholders in the Electric Vehicles industry. The insights gained from the study can contribute to the development of strategies and interventions aimed at promoting entrepreneurship and enhancing the success of the Electric Vehicles industry.in Bangkok. It is important to acknowledge the potential limitations of the study. The use of a survey questionnaire limits the depth of information that can be collected compared to other methods such as interviews or case studies. The self-report nature of the questionnaire may also introduce response bias. However, steps will be taken to ensure the validity and reliability of the questionnaire through pre-testing and adjustments based on feedback.

In conclusion, the chosen data collection method of a survey questionnaire, combined with appropriate sampling techniques and statistical analysis, offers a systematic approach to investigate the relationship between personal characteristics, consumer adoption-related factors, and the consumer adoption of Electric Vehicles in Bangkok, Thailand. The study aims to provide valuable insights and contribute to the existing knowledge in the field of entrepreneurship and the Electric Vehicles industries.

Data Analysis - The data analysis for this study will employ a combination of descriptive and inferential statistical techniques (Smith et al., 2022). Inferential statistical techniques will be applied to examine the relationships and effects of personal characteristics, consumer adoption-related factors, and consumer adoption of Electric Vehicles in Bangkok, Thailand (Siriwan et al., 2020; Supreecha, 2022; Smith et al., 2022). These techniques will help determine the significance and strength of these relationships**.** Pearson Correlation Coefficients Analysis allows for the simultaneous examination of multiple independent variables (consumer adoption-related factors, and these factors affect a dependent variable (Consumer Adoption of Electric Vehicles in Bangkok, Thailand), facilitating the identification of the consumer adoption among the participants.

Ethical Considerations - In conducting this study, ethical principles were observed to protect the rights and well-being of all participants. Informed consent was obtained after participants were provided with information about the study's purpose, procedures, and any potential risks or benefits. Participation was voluntary, and respondents were free to withdraw at any time without penalty. All information collected was treated with strict confidentiality and accessed only by the researcher and authorized personnel. Personal data were anonymized to protect participants' identities and securely stored in accordance with applicable data protection regulations. Furthermore, the study complied with the ethical standards and guidelines of relevant institutional review boards and research ethics committees to ensure respect for participants' rights, privacy, and welfare throughout the research process.

3. Results and discussions

Table 1

Summary Table on Perceived Economic Benefits Of Electric Vehicles

Indicators	Weighted Mean	Verbal Interpretation	Rank
Cost Efficiency	3.22	Agree	2
Performance and Functionality	3.20	Agree	3
Social and Psychological Value	3.31	Agree	1
Composite Mean	3.24	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 1 presents a summary of the respondents' perceived economic benefits of electric vehicles (EVs) across three major dimensions: cost efficiency, performance and functionality, and social and psychological value. The results reveal a composite mean of 3.24, verbally interpreted as Agree, indicating that respondents generally perceive EVs as beneficial across all evaluated aspects. This implies that EVs are widely recognized not only for their financial advantages but also for their functional capabilities and contribution to users' social and psychological well-being. This overall positive perception is consistent with existing literature, which highlights that EV adoption is driven by a combination of economic savings, technological improvements, and social influence (Environmental Defense Fund, 2023; MIT News, 2026). Among the indicators, social and psychological value ranked first (WM=3.31), suggesting that respondents place the highest importance on the intangible benefits of EVs, such as personal satisfaction, environmental responsibility, and enhanced social image. This indicates that emotional and social motivations play a crucial role in shaping favorable attitudes toward EV adoption. Supporting this, recent studies emphasize that individuals are more likely to adopt EVs when they perceive them as symbols of environmental responsibility and modern lifestyle (Sovacool et al., 2023). In addition, cost efficiency ranked second (WM = 3.22), reflecting respondents' recognition of economic benefits such as reduced fuel and maintenance costs. Research confirms that EVs can generate significant long-term savings due to lower operating and maintenance expenses (Consumer Reports, 2023; Environmental Defense Fund, 2023).

On the other hand, performance and functionality ranked third (WM = 3.20), although it remains within the *Agree* range. This suggests that while respondents acknowledge the functional capabilities of EVs, such as driving performance, range, and technological features, these aspects are slightly less influential compared to economic and psychological benefits. Nevertheless, literature indicates that improvements in EV performance, including driving range and reliability, continue to enhance user confidence and satisfaction over time (International Energy Agency, 2024). These advancements reinforce the practicality of EVs for everyday use and support their growing acceptance in the transportation sector. Overall, the findings imply that while all three dimensions contribute positively to the perceived economic benefits of EVs, social and psychological factors emerge as the strongest influence, followed by financial considerations and functional performance. This highlights the multidimensional appeal of EVs and suggests that successful promotion strategies should emphasize not only cost savings but also environmental responsibility and personal value to encourage wider adoption.

Table 2

Summary Table on Stress Environmental Awareness

Indicators	Weighted Mean	Verbal Interpretation	Rank
Pollution Reduction and Environmental Friendliness	3.34	Agree	1
Clean Energy Advocacy	3.18	Agree	3
Social and Community Environmental Support	3.32	Agree	2
Composite Mean	3.28	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 presents the summary of respondents' environmental awareness in terms of pollution reduction and environmental friendliness, clean energy advocacy, and social and community environmental support. The results show a composite mean of 3.28, verbally interpreted as Agree, indicating that respondents generally demonstrate a positive level of environmental awareness across all dimensions. This implies that respondents are knowledgeable about environmental issues and supportive of sustainability efforts, particularly in the context of transportation and energy use. This finding is consistent with the International Energy Agency (2024), which emphasized that increasing public awareness is a key factor in promoting sustainable transport systems and reducing environmental impact. Similarly, Sovacool et al. (2023) noted that environmental awareness strongly influences individuals' attitudes and behaviors toward eco-friendly technologies and practices.

Among the indicators, pollution reduction and environmental friendliness ranked first (WM = 3.34), suggesting that respondents place the highest importance on understanding and addressing environmental problems caused by pollution. This indicates that respondents are highly aware of the harmful effects of emissions and recognize the need for cleaner alternatives. International Energy Agency (2024) reported that transport-related emissions are a major contributor to global environmental issues, reinforcing the importance of pollution awareness. World Health Organization (2022) highlighted that reducing air pollution is essential in improving environmental and public health, which aligns with respondents' strong agreement in this area. Social and community environmental support (WM=3.32) ranked second, followed by clean energy advocacy (WM=3.18) as third. These findings indicate that respondents acknowledge the role of collective efforts and renewable energy promotion in achieving sustainability. This suggests that both community participation and advocacy for clean energy are recognized as important, though slightly less prioritized compared to pollution awareness.

The lowest-ranked indicator is clean energy advocacy. This suggests that while respondents support clean energy initiatives, their level of advocacy may not be as strong as their awareness of pollution or community involvement. Literature emphasizes that clean energy advocacy is essential for achieving long-term sustainability goals. According to International Renewable Energy Agency (2025), increasing support for renewable energy in transportation is crucial for reducing reliance on fossil fuels and mitigating climate change. REN21(2025) noted that expanding renewable energy use in transport significantly contributes to lowering greenhouse gas emissions and advancing sustainable development. Findings imply that although clean energy advocacy ranked lowest among the indicators, it remains a vital component of overall environmental awareness and plays key role in supporting the transition to greener transportation systems.

Table 3
Summary Table on Charging Infrastructure

Indicators	Weighted Mean	Verbal Interpretation	Rank
Availability and Accessibility	3.08	Agree	4
Convenience and Ease of Use	3.23	Agree	2
Economic Feasibility	3.36	Agree	1
Government and Private Sector Support	3.20	Agree	3
Composite Mean	3.22	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 3 presents the summary of respondents' perceptions of charging infrastructure in terms of availability and accessibility, convenience and ease of use, economic feasibility, and government and private sector support. Findings reveal a composite mean of 3.22, verbally interpreted as *Agree*, indicating that respondents generally perceive charging infrastructure as adequate and supportive of electric vehicle (EV) adoption. This suggests that while infrastructure is sufficiently developed to meet current expectations, further improvements may still enhance overall accessibility and efficiency. This is consistent with the International Energy Agency (2024), which emphasized that expanding and improving charging infrastructure is essential for sustaining EV growth. Likewise, Zaino et al. (2024) highlighted that infrastructure readiness—including accessibility, usability, and affordability—is a key determinant of EV adoption.

Among the indicators, economic feasibility ranked first (WM = 3.36), suggesting that respondents consider the cost-related aspects of charging infrastructure as the most favorable. This indicates that EV charging is perceived as affordable, offering good economic value compared to traditional fuel expenses. Supporting this, Consumer Reports (2023) found that EV users benefit from lower energy and maintenance costs, contributing to long-term savings. Similarly, Environmental Defense Fund (2023) reported that reduced operating costs significantly enhance the financial attractiveness of EV ownership. These findings confirm that economic feasibility plays a central role in shaping positive perceptions of EV infrastructure.

Convenience and ease of use ranked second, followed by government and private sector support as third, and availability and accessibility as fourth. Results indicate that respondents generally perceive EV charging as user-friendly and supported by institutions, although accessibility across all areas still requires improvement. Meanwhile, the lowest-ranked indicator is availability and accessibility (WM = 3.08, Rank 4), although still interpreted as *Agree*. This suggests that respondents perceive some limitations in the widespread distribution of charging infrastructure, particularly in less accessible locations. However, literature emphasizes that addressing these gaps is already a major focus globally. The International Energy Agency (2024) reported that while charging networks are expanding rapidly, uneven distribution remains a challenge, especially outside urban centers. Furthermore, IRENA (2025) highlighted that increasing the number and strategic placement of charging stations is crucial for ensuring equitable access and supporting broader EV adoption. These findings imply that although availability and accessibility ranked lowest, it remains a critical factor that requires continued development to fully support the transition to electric mobility.

Table 4
Summary Table on Consumer Adoption Of Electric Vehicles

Indicators	Weighted Mean	Verbal Interpretation	Rank
Adoption Intention	3.19	Agree	2
Perceived Value and Reasonableness	3.17	Agree	3
Innovativeness and Curiosity	3.21	Agree	1
Composite Mean	3.19	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 4 presents the summary of respondents' perceptions of consumer adoption of electric vehicles (EVs) in terms of adoption intention, perceived value and reasonableness, and innovativeness and curiosity. The findings reveal a composite mean of 3.19, verbally interpreted as *Agree*, indicating that respondents generally demonstrate a positive disposition toward adopting EVs. This implies that consumers are open to considering EVs as a future transportation option, supported by their perceptions of value, technological interest, and behavioral intention. This result is consistent with Zaino et al. (2024), who found that consumer adoption of EVs is influenced by a combination of behavioral intention, perceived benefits, and openness to innovation. Similarly, the International Energy Agency (2024) emphasized that increasing consumer acceptance is driven by improvements in EV affordability, performance, and awareness. Among the indicators, innovativeness and curiosity ranked first, suggesting that respondents' interest in new technologies is the strongest factor influencing EV adoption. This indicates that consumers who are curious and open to innovation are more inclined to explore and adopt electric vehicles. Supporting this, research highlights that early adopters of EVs are often characterized by high levels of technological interest and willingness to try new innovations (Zaino et al., 2024). In addition, Abas et al. (2024) emphasized that exposure to technological advancements and increased knowledge significantly enhance consumers' readiness to adopt EVs, reinforcing the importance of curiosity and openness.

Adoption intention ranked second, followed by perceived value and reasonableness as third. These findings indicate that while respondents are willing to consider EVs and recognize their value, their interest in innovation slightly outweighs purely economic or decision-based considerations. This suggests that both rational evaluation and personal motivation contribute to EV adoption. Meanwhile, the lowest-ranked indicator is perceived value and reasonableness, although still interpreted as *Agree*. This suggests that while respondents generally recognize the benefits of EVs, some uncertainties about cost and overall value may still exist. However, literature strongly suggests that these concerns are diminishing over time. According to the International Energy Agency (2024), declining battery costs, government incentives, and improved efficiency are making EVs more economically attractive. Furthermore, Consumer Reports (2023) found that EV ownership leads to significant long-term savings, which strengthens perceived value and justifies initial costs. These findings imply that although ranked lowest, perceived value continues to improve and remains an important factor that supports increasing consumer adoption of electric vehicles.

Table 5
Relationship Between Perceived Economic Benefits Of Electric Vehicles and Environmental Awareness

Cost Efficiency	r-value	p-value	Interpretation
Pollution Reduction and Environmental Friendliness	0.767 ***	<.001	Highly Significant
Clean Energy Advocacy	0.614 ***	<.001	Highly Significant
Social and Community Environmental Support	0.709 ***	<.001	Highly Significant
Performance and Functionality			
Pollution Reduction and Environmental Friendliness	0.409 ***	<.001	Highly Significant
Clean Energy Advocacy	0.790 ***	<.001	Highly Significant
Social and Community Environmental Support	0.628 ***	<.001	Highly Significant
Social and Psychological Value			
Pollution Reduction and Environmental Friendliness	0.546 ***	<.001	Highly Significant
Clean Energy Advocacy	0.533 ***	<.001	Highly Significant
Social and Community Environmental Support	0.549 ***	<.001	Highly Significant

Legend: Significant at p-value < 0.05

Table 5 presents the relationship between perceived economic benefits of electric vehicles (EVs) and environmental awareness using correlation analysis. The results show that all variables have positive correlation coefficients (r-values) with p-values less than .001, indicating highly significant relationships. This implies that as respondents perceive greater economic benefits from EVs, their level of environmental awareness also increases. The strong statistical significance suggests a meaningful association between economic perceptions and environmental consciousness. This finding is consistent with existing literature, which highlights that economic incentives and perceived cost benefits often reinforce pro-environmental attitudes and behaviors toward sustainable technologies (Zaino et al., 2024; International Energy Agency, 2024).

In terms of cost efficiency, results show strong positive relationships with all dimensions of environmental awareness. Highest correlation is observed with pollution reduction and environmental friendliness, followed by social and community environmental support and clean energy advocacy. Findings indicate that respondents who perceive EVs as cost-efficient are more likely to recognize and support efforts to reduce pollution and promote environmental sustainability. This suggests that financial benefits, such as lower operating costs, can enhance environmental awareness and motivate eco-friendly behavior. Supporting this, Consumer Reports (2023) found that cost savings associated with EVs contribute to increased consumer acceptance and environmentally responsible choices. Similarly, Environmental Defense Fund (2023) emphasized that economic advantages of EVs often reinforce sustainability awareness and encourage greener transportation decisions.

Regarding performance and functionality, the correlation results also demonstrate significant relationships with environmental awareness variables. The strongest correlation is with clean energy advocacy, followed by social and community environmental support and pollution reduction and environmental friendliness. This indicates that respondents who perceive EVs as reliable and efficient are more likely to support clean energy initiatives and community-based environmental efforts. This implies that confidence in EV performance enhances trust in sustainable technologies, thereby promoting environmental awareness. Supporting this, the International Energy Agency (2024) noted that improvements in EV performance and reliability increase public confidence and strengthen support for clean energy adoption. Furthermore, Zaino et al. (2024) emphasized that technological advancements in EVs play a critical role in shaping positive environmental attitudes.

For social and psychological value, the results show moderate but still highly significant correlations with all environmental awareness dimensions. The highest correlation is with social and community environmental support, followed closely by pollution reduction and environmental friendliness and clean energy advocacy. Findings suggest that respondents who associate EVs with positive social identity and personal satisfaction are more likely to demonstrate higher environmental awareness. This implies that social influence and personal values are important factors in promoting environmentally responsible behavior. Supporting this, Sovacool et al. (2023) highlighted that social identity and environmental values significantly influence individuals' adoption of sustainable technologies. Additionally, Nguyen et al. (2023) found that consumers who derive personal satisfaction from environmentally friendly actions are more likely to support sustainability initiatives.

Overall, the results indicate that all dimensions of perceived economic benefits—cost efficiency, performance and functionality, and social and psychological value—are significantly associated with environmental awareness. Among these, cost efficiency and performance show stronger correlations, suggesting that practical and functional benefits may have a greater influence on environmental awareness compared to social and psychological factors. These findings underscore the importance of integrating economic, technological, and social perspectives in promoting EV adoption and environmental sustainability. They also suggest that enhancing awareness of both economic benefits and environmental impacts can further strengthen consumer support for electric vehicles.

Table 6

Relationship Between Perceived Economic Benefits Of Electric Vehicles and Charging Infrastructure

Cost Efficiency	r-value	p-value	Interpretation
Availability and Accessibility	0.340 ***	< .001	Highly Significant
Convenience and Ease of Use	0.837 ***	< .001	Highly Significant
Economic Feasibility	0.857 ***	< .001	Highly Significant
Government and Private Sector Support	0.743 ***	< .001	Highly Significant
Performance and Functionality			
Availability and Accessibility	0.694 ***	< .001	Highly Significant
Convenience and Ease of Use	0.660 ***	< .001	Highly Significant
Economic Feasibility	0.321 ***	< .001	Highly Significant
Government and Private Sector Support	0.818 ***	< .001	Highly Significant
Social and Psychological Value			
Availability and Accessibility	0.182 ***	< .001	Highly Significant
Convenience and Ease of Use	0.723 ***	< .001	Highly Significant
Economic Feasibility	0.840 ***	< .001	Highly Significant
Government and Private Sector Support	0.378 ***	< .001	Highly Significant

Legend: Significant at p-value < 0.05

Table 6 presents the relationship between perceived economic benefits of electric vehicles (EVs) and charging infrastructure using correlation analysis. The results indicate that all variables have positive correlation coefficients (r-values) with p-values less than .001, signifying highly significant relationships. This implies that stronger perceptions of economic benefits are associated with more favorable perceptions of charging infrastructure. In other words, as respondents recognize greater economic advantages of EVs, they also tend to perceive charging infrastructure as more available, accessible, convenient, and supportive. This finding is supported by Zaino et al. (2024), who emphasized that economic and infrastructural factors are interconnected in shaping EV adoption. Similarly, the International Energy Agency (2024) highlighted that infrastructure development and economic benefits jointly influence consumer acceptance of EV technology.

In terms of cost efficiency, the results show strong positive relationships with all aspects of charging infrastructure. The highest correlations are observed with economic feasibility and convenience and ease of use, followed by government and private sector support, while availability and accessibility shows a moderate but still significant relationship. These findings indicate that respondents who perceive EVs as cost-efficient are more likely to view charging infrastructure as economically beneficial and user-friendly. This suggests that financial advantages reinforce positive perceptions of infrastructure convenience and affordability. Supporting this, Consumer Reports (2023) found that lower operating costs of EVs strengthen positive attitudes toward charging systems. Additionally, Environmental Defense Fund (2023) reported that economic savings from EV use are closely linked with satisfaction regarding infrastructure efficiency and affordability.

For performance and functionality, the findings also reveal significant correlations with charging infrastructure variables. The strongest relationship is with government and private sector support, followed by availability and accessibility and convenience and ease of use, while economic feasibility shows a weaker but still significant association. These results suggest that respondents who perceive EVs as reliable and functional are more likely to recognize the importance of institutional support and infrastructure availability. This implies that confidence in EV performance enhances trust in the supporting infrastructure and policy environment. Supporting this, the International Energy Agency (2024) noted that improvements in EV performance and infrastructure development are mutually reinforcing factors that increase consumer confidence. Furthermore, Abas et al. (2024) emphasized that effective policies and infrastructure investment are crucial in enhancing both EV performance perception and adoption.

Considering the social and psychological value, all relationships remain positive and highly significant. The strongest correlations are with economic feasibility and convenience and ease of use, followed by government and private sector support, while availability and accessibility has the weakest association. These findings suggest that respondents who perceive EVs as socially and psychologically rewarding are more likely to appreciate the financial and practical aspects of charging infrastructure. This implies that positive emotional and social perceptions of EVs can reinforce satisfaction with infrastructure, particularly when it is convenient and economically viable. Meanwhile, the lowest relationship observed is between social and psychological value and availability and accessibility, although still statistically significant. This suggests that while social and emotional factors influence perceptions of infrastructure, they may not strongly affect views on physical availability. However, literature indicates that infrastructural improvements still play an essential role in shaping overall consumer perception. According to the International Energy Agency (2024), expanding charging networks and improving accessibility are critical for strengthening confidence in EV adoption. Additionally, Rotimi-Ojo (2025) emphasized that infrastructure expansion through coordinated investments is essential in supporting both economic and social dimensions of EV adoption.

Results indicate that all dimensions of perceived economic benefits—cost efficiency, performance and functionality, and social and psychological value—are significantly associated with perceptions of charging infrastructure. Among these, cost efficiency shows the strongest relationships, particularly with economic feasibility and convenience, suggesting that financial considerations are the most influential factor linking economic benefits and infrastructure perception. These findings highlight the importance of integrating cost advantages with infrastructure development to promote electric vehicle adoption effectively.

Table 7 presents the relationship between perceived economic benefits of electric vehicles (EVs) and consumer adoption using correlation analysis. The results indicate that all variables have positive correlation coefficients (r-values) with p-values less than .001, signifying highly significant relationships. This implies that as respondents perceive stronger economic benefits from EVs, their likelihood of adopting these vehicles also increases. The findings suggest that economic considerations play a crucial role in shaping consumer behavior toward EV adoption. This is supported by Zaino et al. (2024), who emphasized that economic perceptions significantly influence consumer adoption decisions. Similarly, the International Energy Agency (2024) reported that affordability and long-term savings are major drivers of EV adoption globally.

Table 7
Relationship between perceived economic benefits of electric vehicles and consumer adoption of electric vehicles

Cost Efficiency	r-value	p-value	Interpretation
Adoption Intention	0.533 ***	<.001	Highly Significant
Perceived Value and Reasonableness	0.539 ***	<.001	Highly Significant
Innovativeness and Curiosity	0.668 ***	<.001	Highly Significant
Performance and Functionality			
Adoption Intention	0.574 ***	<.001	Highly Significant
Perceived Value and Reasonableness	0.758 ***	<.001	Highly Significant
Innovativeness and Curiosity	0.681 ***	<.001	Highly Significant

Social and Psychological Value			
Adoption Intention	0.369 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.345 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.559 ***	< .001	Highly Significant

Legend: Significant at p-value < 0.05

In terms of cost efficiency, results show moderate to strong positive relationships with all aspects of consumer adoption. Highest correlation is observed with innovativeness and curiosity, followed by perceived value and reasonableness and adoption intention. Findings indicate that respondents who perceive EVs as cost-efficient are more likely to develop interest in EV technologies and view them as valuable investments suggesting that financial benefits not only influence rational decision-making but also stimulate curiosity and openness to innovation. Consumer Reports (2023) found that cost savings associated with EVs enhance consumer willingness to consider and adopt them. Environmental Defense Fund (2023) reported that long-term financial benefits significantly improve consumers' perceived value of EVs, thereby encouraging adoption. For performance and functionality, results demonstrate strong and highly significant relationships with consumer adoption variables. Highest correlation is with perceived value and reasonableness, followed by innovativeness and curiosity and adoption intention. Results suggest that respondents who perceive EVs as reliable, efficient, and technologically advanced are more likely to value them positively and consider adopting them implying that confidence in EV performance enhances perceived value and willingness to adopt. IEA (2024) highlighted that improvements in EV performance, such as driving range and reliability, significantly increase consumer acceptance. Abas et al. (2024) emphasized that technological performance and functional benefits are key determinants of consumers' perceived value and adoption intentions.

Considering the social and psychological value, the correlations remain positive and significant but relatively weaker compared to other dimensions. The strongest relationship is with innovativeness and curiosity, followed by adoption intention and perceived value and reasonableness. These findings suggest that respondents who associate EVs with positive social identity and personal satisfaction are more likely to show interest and curiosity toward EV technologies. This implies that social and emotional factors can influence consumer behavior, particularly in fostering interest and engagement with EV innovation. Meanwhile, the lowest relationship observed is between social and psychological value and perceived value and reasonableness, although it remains statistically significant. This suggests that while social and psychological factors contribute to adoption, they may have less influence on consumers' rational evaluation of EV value compared to economic and functional factors. However, literature confirms that these factors still play an important role. Sovacool et al. (2023) emphasized that social influence and environmental identity contribute to the adoption of sustainable technologies. Additionally, Nguyen et al. (2023) noted that personal satisfaction and values can enhance pro-environmental purchasing behavior. These findings imply that although weaker, social and psychological value remains a meaningful contributor to EV adoption.

Overall, the results indicate that all dimensions of perceived economic benefits—cost efficiency, performance and functionality, and social and psychological value—are significantly associated with consumer adoption of electric vehicles. Among these, performance and functionality shows the strongest relationships, particularly in influencing perceived value and adoption decisions. This highlights that while economic benefits are important, practical performance and technological capabilities play a more dominant role in encouraging consumers to adopt EVs. These findings underscore the importance of improving both economic and functional aspects to strengthen consumer adoption of electric vehicles.

Table 8

Relationship Between Environmental Awareness and Charging Infrastructure

Pollution Reduction and Environmental Friendliness	r-value	p-value	Interpretation
Availability and Accessibility	0.280 ***	< .001	Highly Significant
Convenience and Ease of Use	0.675 ***	< .001	Highly Significant
Economic Feasibility	0.782 ***	< .001	Highly Significant
Government and Private Sector Support	0.511 ***	< .001	Highly Significant

Clean Energy Advocacy			
Availability and Accessibility	0.782 ***	<.001	Highly Significant
Convenience and Ease of Use	0.815 ***	<.001	Highly Significant
Economic Feasibility	0.555 ***	<.001	Highly Significant
Government and Private Sector Support	0.753 ***	<.001	Highly Significant
Social and Community Environmental Support			
Availability and Accessibility	0.383 ***	<.001	Highly Significant
Convenience and Ease of Use	0.729 ***	<.001	Highly Significant
Economic Feasibility	0.559 ***	<.001	Highly Significant
Government and Private Sector Support	0.663 ***	<.001	Highly Significant

Legend: Significant at p-value < 0.05

Table 8 presents the relationship between environmental awareness and charging infrastructure using correlation analysis. The results indicate that all variables show positive correlation coefficients (r-values) with p-values less than .001, signifying highly significant relationships. This implies that higher levels of environmental awareness are associated with more favorable perceptions of charging infrastructure. In other words, individuals who are more aware of environmental issues tend to recognize the importance, availability, and usability of EV charging systems. This finding aligns with existing studies, which show that environmental awareness plays a crucial role in shaping attitudes toward infrastructure development and the adoption of sustainable technologies such as electric vehicles (Zaino et al., 2024; International Energy Agency, 2024).

In terms of pollution reduction and environmental friendliness, significant relationships are observed across all aspects of charging infrastructure. The highest correlation is with economic feasibility, followed by convenience and ease of use and government and private sector support, while availability and accessibility shows a weaker but still significant relationship. These findings indicate that respondents who are highly aware of pollution issues are more likely to perceive charging infrastructure as economically beneficial and convenient. This suggests that environmental concern enhances appreciation for cost-effective and user-friendly infrastructure solutions. Supporting this, the International Energy Agency (2024) emphasized that awareness of environmental impacts often increases acceptance of EV-related infrastructure. Similarly, studies show that individuals concerned about pollution are more inclined to support sustainable transportation systems, including charging networks (Sovacool et al., 2023).

For clean energy advocacy, the results show strong positive relationships with all charging infrastructure variables. The highest correlation is observed with convenience and ease of use, followed by availability and accessibility and government and private sector support, while economic feasibility shows a moderate relationship. These results suggest that respondents who advocate for clean energy are more likely to perceive charging infrastructure as accessible, convenient, and well-supported by institutions. This implies that support for renewable energy aligns closely with positive perceptions of infrastructure development. Supporting this, the International Renewable Energy Agency (2025) highlighted that promoting clean energy initiatives strengthens public support for EV infrastructure expansion. Furthermore, Zaino et al. (2024) emphasized that clean energy awareness significantly enhances acceptance of supporting infrastructure systems.

As to social and community environmental support, all relationships remain positive and statistically significant. The strongest correlation is with convenience and ease of use, followed by government and private sector support and economic feasibility, while availability and accessibility shows a weaker association. These findings indicate that respondents who value collective environmental responsibility are more likely to perceive charging infrastructure as user-friendly and supported by institutions. This suggests that community-driven environmental awareness contributes to positive perceptions of infrastructure effectiveness and usability. Meanwhile, the lowest relationship observed is between pollution reduction and environmental friendliness and availability and accessibility, although it remains highly significant. This suggests that while environmental awareness influences general perceptions of infrastructure, it may have less impact on perceptions of physical infrastructure distribution. However, literature emphasizes that improving accessibility remains essential for strengthening both awareness and adoption. According to the International Energy Agency (2024), expanding charging infrastructure networks is necessary to address accessibility concerns and promote widespread EV adoption. Additionally, Rotimi-Ojo (2025) highlighted that investments in infrastructure development are crucial for meeting growing demand and improving public confidence in EV systems.

Overall, the findings indicate that all dimensions of environmental awareness—pollution reduction, clean energy advocacy, and social/community support—are significantly associated with perceptions of charging infrastructure. Among these, clean energy advocacy demonstrates the strongest relationships, particularly with convenience and accessibility, suggesting that individuals who actively support clean energy are more likely to view charging infrastructure positively. These results highlight the importance of strengthening environmental awareness to enhance perceptions of infrastructure and support the broader adoption of electric vehicles.

Table 9

Relationship Between Environmental Awareness and Consumer Adoption Of Electric Vehicles

Pollution Reduction and Environmental Friendliness	r-value	p-value	Interpretation
Adoption Intention	0.356 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.535 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.653 ***	< .001	Highly Significant
Clean Energy Advocacy			
Adoption Intention	0.591 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.652 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.810 ***	< .001	Highly Significant
Social and Community Environmental Support			
Adoption Intention	0.762 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.911 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.666 ***	< .001	Highly Significant

Legend: Significant at p-value < 0.05

Table 9 presents the relationship between environmental awareness and consumer adoption of electric vehicles (EVs) using correlation analysis. Results indicate that all variables exhibit positive correlation coefficients with p-values less than .001, signifying highly significant relationships. This implies that higher levels of environmental awareness are associated with stronger consumer adoption of EVs. Individuals who are more conscious of environmental issues tend to display greater intention, perceived value, and openness toward adopting EV technology. Finding is consistent with prior studies, which show that environmental awareness significantly influences consumer adoption of sustainable innovations, including electric vehicles (Zaino et al.,2024). International Energy Agency (2024) emphasized that increased environmental concern drives the transition toward cleaner mobility and strengthens consumer willingness to adopt EVs.

In terms of pollution reduction and environmental friendliness, the results show significant relationships with all dimensions of consumer adoption. The strongest correlation is observed with innovativeness and curiosity, followed by perceived value and reasonableness and adoption intention. These findings indicate that respondents who are more aware of pollution issues are more likely to show interest in EV technology and perceive it as valuable. This suggests that environmental concern not only influences attitudes but also enhances curiosity and engagement with innovative transport solutions. Sovacool et al. (2023) highlighted that individuals concerned about environmental sustainability are more likely to adopt new clean technologies. Additionally, Nguyen et al. (2023) found that environmental awareness positively affects consumers' perception of product value and their willingness to engage in eco-friendly behavior. For clean energy advocacy, the correlation results demonstrate strong positive relationships with all consumer adoption variables. The highest correlation is observed with innovativeness and curiosity, followed by perceived value and reasonableness and adoption intention. These findings suggest that respondents who actively support clean energy initiatives are more likely to be curious about EV technologies and perceive them as valuable and worth adopting. This implies that advocacy for renewable energy strongly influences both behavioral intention and perception. Supporting this, the International Renewable Energy Agency (2025) emphasized that promoting clean energy awareness significantly enhances public acceptance of electric mobility. Furthermore, research indicates that individuals who endorse clean energy policies are more inclined to adopt technologies aligned with sustainability goals (Zaino et al., 2024).

In terms of social and community environmental support, the results show the strongest correlations among all variables. The highest relationship is with perceived value and reasonableness, followed by adoption intention and innovativeness and curiosity. These findings indicate that respondents who believe in collective environmental responsibility are more likely to view EVs as valuable and demonstrate strong intentions to adopt them. This suggests that community influence and social responsibility significantly shape consumer perceptions and decisions. Social norms and community-based values may enhance trust in EVs and encourage adoption through shared beliefs and collective actions. Meanwhile, the lowest relationship observed is between pollution reduction and environmental friendliness and adoption intention, although it remains highly significant. This suggests that environmental concern alone may not be sufficient to directly drive purchase intention without the support of other factors such as perceived value or social influence. However, literature confirms that environmental awareness still plays an essential role. According to the International Energy Agency (2024), combining environmental awareness with economic incentives and infrastructure improvements significantly strengthens adoption intention. Additionally, Sovacool et al. (2023) emphasized that environmental concern must be complemented by practical considerations to effectively influence consumer decisions. Overall, the findings indicate that all dimensions of environmental awareness—pollution reduction, clean energy advocacy, and social/community environmental support—are significantly associated with consumer adoption of electric vehicles. Among these, social and community environmental support demonstrates the strongest overall relationships, particularly in influencing perceived value and adoption intention. This highlights the importance of social influence and shared responsibility in promoting EV adoption. These results suggest that increasing environmental awareness, particularly through community engagement and clean energy advocacy, can significantly enhance consumer acceptance and adoption of electric vehicles.

Table 10 presents the relationship between charging infrastructure and consumer adoption of electric vehicles (EVs) using correlation analysis. The results indicate that all variables exhibit positive correlation coefficients (r-values) with p-values less than .001, signifying highly significant relationships. This implies that better perceptions of charging infrastructure are associated with higher levels of consumer adoption of EVs. In other words, as charging infrastructure becomes more available, convenient, affordable, and supported, consumers are more likely to develop stronger intentions, perceive greater value, and show increased interest in EV technologies. This finding is supported by Zaino et al. (2024), which emphasized that infrastructure readiness is a crucial determinant of EV adoption. Similarly, the International Energy Agency (2024) highlighted that the expansion and improvement of charging infrastructure significantly enhance consumer confidence and adoption rates.

Table 10

Relationship Between Charging Infrastructure and Consumer Adoption Of Electric Vehicles

Availability and Accessibility	r-value	p-value	Interpretation
Adoption Intention	0.622 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.547 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.586 ***	< .001	Highly Significant
Convenience and Ease of Use			
Adoption Intention	0.519 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.594 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.792 ***	< .001	Highly Significant
Economic Feasibility			
Adoption Intention	0.384 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.370 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.609 ***	< .001	Highly Significant
Government and Private Sector Support			
Adoption Intention	0.681 ***	< .001	Highly Significant
Perceived Value and Reasonableness	0.697 ***	< .001	Highly Significant
Innovativeness and Curiosity	0.667 ***	< .001	Highly Significant

Legend: Significant at p-value < 0.05

In terms of availability and accessibility, the results show strong positive relationships with all adoption variables. The highest correlation is observed with adoption intention, followed by innovativeness and curiosity and perceived value and reasonableness. These findings indicate that respondents who perceive charging stations as widely available and accessible are more likely to intend to adopt EVs and view them positively. This suggests that ease of access to infrastructure reduces uncertainty and increases consumer willingness to adopt EVs. Supporting this, the International Energy Agency (2024) reported that widespread availability of charging stations is essential in reducing range anxiety and encouraging EV adoption. Studies show that accessibility of charging facilities directly influences consumer confidence and decision-making (Zaino et al., 2024). For convenience and ease of use, the results reveal significant relationships with all consumer adoption variables. The strongest correlation is with innovativeness and curiosity, followed by perceived value and reasonableness and adoption intention. These findings suggest that when charging systems are easy to use and integrate into daily routines, consumers are more likely to explore and adopt EV technologies. This implies that user-friendly infrastructure enhances both the practical value and appeal of EVs. Supporting this, the International Energy Agency (2024) emphasized that improvements in charging convenience, such as faster and simpler charging processes, increase user satisfaction and adoption. Additionally, research shows that ease of use is a critical factor influencing acceptance of new technologies (Zaino et al., 2024).

The highest correlation is with innovativeness and curiosity, followed by adoption intention and perceived value and reasonableness. These findings indicate that respondents who perceive EV charging as affordable are more likely to show interest and curiosity toward EV technologies. This suggests that financial feasibility not only influences practical decisions but also encourages engagement with innovation. Consumer Reports (2023) noted that lower operating costs increase consumer willingness to adopt EVs. Similarly, Environmental Defense Fund (2023) emphasized that economic affordability enhances perceived value and supports adoption behaviors. The lowest relationships are observed within economic feasibility, particularly with perceived value and reasonableness, although still statistically significant. This suggests that while cost considerations are important, they may not be as influential as infrastructure convenience or accessibility in shaping perceived value. However, literature confirms that cost remains a key factor. According to the International Energy Agency (2024), affordability and cost transparency are critical in improving adoption rates. Studies highlight that economic incentives and cost reductions contribute significantly to long-term EV acceptance (Zaino et al., 2024).

Lastly, for government and private sector support, the results demonstrate strong positive relationships with all adoption variables. The highest correlation is with perceived value and reasonableness, followed by adoption intention and innovativeness and curiosity. These findings suggest that respondents who perceive strong institutional support are more likely to view EVs positively and intend to adopt them. This implies that policies, incentives, and investments from both sectors enhance consumer trust and confidence in EV systems. Supporting this, Abas et al. (2024) emphasized that government incentives and policy support significantly increase EV adoption rates. Additionally, the U.S. Department of Energy (2024) highlighted that coordinated public and private investments are essential in building consumer confidence and accelerating EV adoption. Overall, the findings indicate that all dimensions of charging infrastructure—availability and accessibility, convenience and ease of use, economic feasibility, and government and private sector support—are significantly associated with consumer adoption of electric vehicles. Among these, convenience and ease of use and institutional support demonstrate the strongest relationships, highlighting the importance of user-friendly systems and policy backing. These results underscore that improving infrastructure quality and support mechanisms is essential in promoting widespread adoption of electric vehicles.

Table 11 presents the results of the multiple linear regression analysis conducted to determine which factors significantly influence electric vehicle adoption. The findings reveal that the regression model identified several significant predictors of electric vehicle adoption, as indicated by their corresponding p-values being less than the 0.05 level of significance. Among the predictors, Social and Community Environmental Support emerged as the strongest positive predictor of electric vehicle adoption indicating that greater community encouragement, societal responsibility, and support for environmental sustainability substantially increase the likelihood of consumers adopting electric vehicles. Clean Energy Advocacy significantly and positively influenced electric vehicle adoption, suggesting that individuals who strongly support renewable energy initiatives are more inclined to adopt electric vehicles.

Table 11

Predictors Influencing Electric Vehicle Adoption

Indicators	B	t-value	p-value	Interpretation
(Intercept)		9.049	< .001	Highly Significant
Cost Efficiency	-0.15845	-3.783	< .001	Highly Significant
Performance and Functionality	-0.01649	-0.648	0.518	Not Significant
Social and Psychological Value	-0.07214	2.560	0.011	Significant
Pollution Reduction and Environmental Friendliness	0.15529	5.332	< .001	Highly Significant
Clean Energy Advocacy	0.55578	13.875	< .001	Highly Significant
Social and Community Environmental Support	0.92181	49.765	< .001	Highly Significant
Availability and Accessibility	0.08910	4.150	< .001	Highly Significant
Convenience and Ease of Use	-0.67696	-18.925	< .001	Highly Significant
Economic Feasibility	-0.00473	-0.130	0.897	Not Significant
Government and Private Sector Support	0.22730	7.684	< .001	Highly Significant

Legend: Significant at p-value < 0.05

Government and Private Sector Support was found to be a highly significant positive predictor, indicating that incentives, policies, and investments from both government and private organizations contribute to increased consumer adoption. Likewise, Pollution Reduction and Environmental Friendliness and Availability and Accessibility of charging infrastructure positively influenced electric vehicle adoption, highlighting the importance of environmental concerns and adequate charging infrastructure in shaping consumer decisions. Cost Efficiency showed a statistically significant but negative relationship with electric vehicle adoption. This suggests that when the effects of all other variables are controlled, respondents' perceptions regarding cost efficiency may not necessarily translate into higher adoption levels, possibly due to concerns about the initial purchase cost of electric vehicles. Convenience and Ease of Use demonstrated a highly significant negative effect, indicating an inverse relationship with adoption when considered alongside the other predictors in the model. Result may suggest the presence of overlapping effects with other infrastructure-related variables.

In contrast, Performance and Functionality and Economic Feasibility were found to be non-significant predictors of electric vehicle adoption. This implies that perceptions regarding vehicle performance and the affordability of charging-related expenses do not significantly influence adoption decisions once other determinants are taken into account. Overall, the results indicate that environmental awareness factors and institutional support mechanisms are the most influential determinants of electric vehicle adoption, with Social and Community Environmental Support, Clean Energy Advocacy, and Government and Private Sector Support serving as the strongest predictors. These findings suggest that enhancing environmental education, strengthening community engagement, and expanding government and private sector initiatives may be effective strategies for promoting the adoption of electric vehicles.

Table 12

Strategic Action Plan for Improving Consumer Adoption of Electric Vehicles in Bangkok, Thailand

KRA (Key Result Area)	Strategies	Objective of the Strategies	Persons Involved	Expected Outcomes
Perceived Value and Reasonableness Electric vehicles offer benefits that justify their cost.	1. Launch total cost of ownership (TCO) awareness campaigns comparing EV operating and maintenance costs with conventional vehicles.	To help consumers understand the long-term financial benefits of EV ownership.	Government agencies, EV manufacturers, dealerships, consumer advocacy groups	Increased consumer awareness of the economic benefits of EVs.
	2. Develop interactive cost-savings calculators and online platforms for prospective buyers.	To provide consumers with personalized estimates of potential savings from EV adoption.	Government agencies, technology providers, EV dealers	Improved consumer perception that EV benefits justify their cost.

	3. Promote real-life testimonials and case studies of EV owners.	To demonstrate actual financial and practical benefits experienced by EV users.	EV owner associations, media organizations, EV manufacturers	Greater consumer confidence in the value proposition of EVs.
Electric vehicles are worth considering despite their initial purchase price.	1. Expand financial assistance programs such as subsidies, tax incentives, and low-interest financing schemes.	To reduce the perceived burden of the initial purchase price of EVs.	Government agencies, financial institutions, policymakers	Improved affordability and increased willingness to consider EV purchases.
	2. Conduct public information campaigns highlighting long-term savings and return on investment.	To emphasize that higher upfront costs can be offset by lower operating and maintenance expenses.	Government agencies, EV manufacturers, educational institutions	Enhanced perception of EVs as a worthwhile long-term investment.
	3. Introduce promotional programs and flexible payment options through dealerships.	To make EV ownership more financially accessible to a broader consumer market.	EV dealerships, automotive companies, financial institutions	Increased consumer interest and higher EV adoption rates.

4. Conclusions and recommendations

The respondents generally agreed on the the economic benefits of EVs such as cost efficiency, performance functionality, and social and psychological value. The respondents generally recognized the environmental benefits of EVs, particularly their role in reducing pollution and promoting environmental sustainability. The respondents have a moderately positive perception of charging infrastructure, particularly in terms of its economic benefits and user convenience. The respondents have favorable attitude toward EV adoption, driven primarily by consumers' interest in innovation and emerging technologies There is significant relationship among Economic Benefits, Environmental Awareness, and Charging Infrastructure and Electric Vehicle Adoption in Bangkok. The environmental awareness and institutional support are the most influential factors driving electric vehicle adoption. Proposed Strategic Action Plan for Improving Consumer Adoption of Electric Vehicles in Bangkok, Thailand was prepared.

Government agencies and environmental organizations may strengthen environmental awareness campaigns emphasizing pollution reduction, clean energy advocacy, and community environmental responsibility, as these factors were found to be among the strongest predictors of electric vehicle (EV) adoption. Government and private sector stakeholders may continue expanding and improving EV charging infrastructure, particularly in terms of accessibility, availability, and institutional support, to enhance consumer confidence and encourage wider EV adoption. EV manufacturers and dealers may highlight the environmental and innovative aspects of EVs in their marketing strategies, as consumers showed favorable perceptions toward innovativeness, curiosity, and environmental benefits associated with EV ownership. Policymakers may develop supportive programs and incentives that encourage EV adoption, including public-private partnerships, charging station development, and policies that promote sustainable transportation practices. Educational institutions and community organizations may conduct information drives and awareness programs to improve public understanding of the economic and environmental benefits of EVs, thereby strengthening positive consumer perceptions and adoption intentions. The Proposed Strategic Action Plan for Improving Consumer Adoption of Electric Vehicles in Bangkok, Thailand may be considered for implementation. Future researchers may further investigate the unexpected negative effects of certain predictors, such as cost efficiency and convenience and ease of use, to better understand their influence on EV adoption and to validate the findings of the study.

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Influence of work hours, job security, and workplace support on job satisfaction of foreign laborers in Eastern Thailand's industrial sector

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Abstract

This study examined the influence of work hours, job security, and workplace support on the job satisfaction of foreign laborers in industrial factories in Eastern Thailand. Specifically, the study assessed work hours in terms of compliance with labor standards, standard working hours, overtime management, and flexibility of work schedules; job security in terms of promotion and career advancement, income stability and appropriateness, and skill development and recognition; and workplace support in terms of work flexibility and leave benefits, organizational clarity and stability, and supervisory and career support. Job satisfaction was evaluated in terms of satisfaction with work conditions, compensation and benefits, and job fulfillment. The study employed a quantitative descriptive-correlational research design. Data were gathered from 284 foreign laborers employed in industrial factories in Eastern Thailand using a structured survey questionnaire. Descriptive statistics were utilized to determine the levels of work hours, job security, workplace support, and job satisfaction. Pearson Product-Moment Correlation was used to examine the relationships among the variables, while Multiple Regression Analysis was employed to identify the factors that significantly influence job satisfaction. The findings revealed that respondents generally perceived favorable conditions regarding work hours, job security, and workplace support. Likewise, the level of job satisfaction among foreign laborers was found to be favorable. Correlation analysis showed significant relationships among work hours, job security, workplace support, and job satisfaction. Furthermore, regression analysis indicated that the identified workplace factors significantly influenced job satisfaction, with one or more variables emerging as significant predictors. The study concludes that work-related conditions, employment security, and organizational support play critical roles in enhancing the job satisfaction of foreign laborers in Eastern Thailand's industrial sector. The findings emphasize the importance of ensuring compliance with labor standards, providing stable employment opportunities, supporting employee development, and fostering a supportive work environment to improve worker satisfaction and retention. Based on the findings, a framework was proposed to serve as a guide for industrial organizations in strengthening employee welfare, improving workplace conditions, and promoting higher levels of job satisfaction among foreign laborers.

Keywords: work hours, job security, workplace support, job satisfaction, foreign laborers, industrial sector, Thailand

Influence of work hours, job security, and workplace support on job satisfaction of foreign laborers in Eastern Thailand's industrial sector

1. Introduction

Organizations rely on several fundamental factors to achieve success, including personnel, capital, raw materials, and machinery. While all these elements are essential, human resources are widely regarded as the most valuable asset of any organization. This is because employees possess the knowledge, skills, creativity, and problem-solving abilities needed to effectively utilize other resources and drive organizational performance. The success of any organization largely depends on the quality and efficiency of its workforce. Organizations with knowledgeable, capable, and skilled personnel are more likely to grow and adapt to rapidly changing economic conditions. However, possessing skills alone does not guarantee success. Employees must also be motivated and willing to perform to their full potential. Such motivation is closely linked to how satisfied and happy employees are within their workplace. When employees feel dissatisfied, their performance declines, and organizational goals may not be achieved effectively (Nithipong, 2021). Therefore, job satisfaction is considered a key factor that influences employee behavior, performance, and overall organizational success.

Human resource management plays an essential role in developing a high-quality workforce and maintaining employee satisfaction. Leaders and executives must focus not only on productivity but also on improving the quality of work life for employees. This includes providing fair compensation, ensuring job security, creating a safe working environment, and offering opportunities for personal and professional development. When employees experience a high quality of work life, they are more likely to feel valued, motivated, and committed to the organization. As a result, organizations benefit from increased productivity, reduced turnover, and improved performance (Nachachon, 2025).

The concept of quality of work life emphasizes the importance of creating a supportive and positive work environment. According to Walton's framework, quality of work life includes several key components such as fair and adequate compensation, safe and healthy working conditions, opportunities for growth and job security, social integration, respect for employee rights, work-life balance, and contributions to society (Suthaporn, 2022). These components highlight the need for organizations to consider both the professional and personal well-being of their employees. By addressing these aspects, organizations can enhance employee satisfaction, increase morale, and foster a positive organizational culture. One crucial aspect of quality of work life is work-life balance. Work-life balance refers to the ability of employees to effectively manage their work responsibilities alongside their personal lives, including family, rest, and leisure activities. Employees who achieve a healthy work-life balance are generally more productive, less stressed, and more committed to their jobs. On the other hand, excessive workloads, long working hours, and lack of flexibility may negatively affect employees' well-being and job performance (Anyamanee, 2021). In today's fast-paced work environment, organizations are increasingly recognizing the importance of flexible working arrangements, such as shift systems, hybrid work, and reasonable working hours, to support employees' needs and improve job satisfaction.

Job satisfaction itself is defined as an individual's overall attitude or emotional response toward their job, which can be either positive or negative (Nithipong, 2021). It reflects how well an employee's expectations and needs are met by their work environment. Job satisfaction is influenced by various factors that can be grouped into four main categories. First, personal factors include characteristics such as age, gender, education, work experience, and individual motivation. Second, job-related factors involve the nature of the work, job roles, and career development opportunities. Third, management factors include policies related to job security, supervision, communication, compensation, and organizational support. Finally, environmental factors focus on the physical and social work environment, such as workplace conditions, relationships with colleagues, and overall organizational atmosphere (Faculty of Psychology, 2024).

Among these influencing factors, work hours, job security, and workplace support play particularly important roles in shaping employee satisfaction. Work hours affect how employees manage their time and energy, directly influencing their work-life balance. Employees who are required to work excessive or irregular hours may experience fatigue, stress, and reduced motivation. Conversely, reasonable and flexible working hours allow employees to maintain a balance between work and personal life, leading to higher satisfaction and improved performance. Job security is another critical factor that affects employees' feelings toward their work. Employees who feel secure in their jobs are more likely to be committed, motivated, and loyal to the organization. On the other hand, uncertainty about employment can create anxiety, reduce morale, and negatively impact performance. In industrial sectors, where economic fluctuations and labor demands may change rapidly, job security becomes even more important for maintaining a stable and productive workforce. Workplace support is also essential in promoting job satisfaction. A supportive work environment includes positive relationships between employees and supervisors, effective communication, and organizational policies that prioritize employee well-being. Workplace support can take various forms, such as flexible leave policies, fair treatment, teamwork, and opportunities for employee participation in decision-making.

In addition to these factors, social relationships within the workplace significantly influence employee happiness. Positive interactions with coworkers and supervisors create a sense of community and cooperation, which helps reduce stress and improve job satisfaction. Studies have shown that good relationships in the workplace often have a greater impact on employee happiness than financial compensation alone (Anyamanee, 2021). Therefore, organizations must foster a collaborative and inclusive work environment to enhance employee well-being.

In the context of Eastern Thailand, the industrial sector plays a significant role in economic development, particularly in provinces such as Chonburi, Rayong, and Chachoengsao. This region is home to numerous factories and industrial estates that rely heavily on foreign laborers from neighboring countries such as Myanmar, Cambodia, Laos, and Vietnam. These workers contribute significantly to the productivity and growth of the industrial sector. However, they often face unique challenges related to working conditions, job security, cultural differences, and access to workplace support. Foreign laborers in industrial factories may experience difficulties in adapting to new environments, language barriers, and limited access to social support systems. These challenges can affect their job satisfaction and overall well-being. Additionally, factors such as long working hours, job insecurity, and lack of organizational support may further impact their motivation and performance. Therefore, it is important to understand the specific factors that influence job satisfaction among foreign workers in this region.

This study focuses on examining the influence of work hours, job security, and workplace support on the job satisfaction of foreign laborers in Eastern Thailand's industrial sector. By analyzing these variables, the study aims to provide insights into how organizations can improve working conditions and enhance employee satisfaction. Understanding these relationships is essential for developing effective human resource policies and practices that support both employee well-being and organizational success. Furthermore, the findings of this research are expected to contribute to the existing body of knowledge on work-life balance and job satisfaction, particularly in the context of foreign labor in industrial settings. The study may also provide practical recommendations for employers and policymakers to improve workplace conditions, promote work-life balance, and create a more supportive environment for foreign workers. Ultimately, enhancing job satisfaction among foreign laborers can lead to increased productivity, reduced turnover, and sustainable growth in the industrial sector of Eastern Thailand.

Objectives of the Study - This study aims to examine the influence of work hours, job security, and workplace support on job satisfaction of foreign laborers in industrial factories in Eastern Thailand. Specifically, it aims to examine the work hours of foreign laborers in industrial factories in terms of compliance with labor standards, standard working hours, overtime management, and flexibility of work schedules; assess the level of job security in terms of promotion and career advancement, income stability and appropriateness, and skill development and recognition; examine the level of workplace support in terms of work flexibility and leave benefits, organizational clarity and stability, and supervisory and career support. Work-life balance, and job satisfaction among foreign laborers; determine the level of job satisfaction of foreign laborers in terms of: satisfaction with work conditions, compensation and benefits, and job fulfillment'; Test the significant relationship among work hours, job security and workplace support; determine the influence of work hours, job security, and workplace support on job satisfaction; Proposed Framework for Enhanced Job Satisfaction of Foreign Laborers in Eastern Thailand's Industrial Sector.

2. Methods

Research Design - This study employed a quantitative descriptive–correlational research design to examine the influence of work hours, job security, and workplace support on the job satisfaction of foreign laborers in Eastern Thailand's industrial sector. The descriptive method was used to summarize the respondents' perceptions of each variable, while the correlational approach was utilized to analyze the relationships and influence among the variables. Statistical tools such as correlation and regression analysis were applied to determine the strength and direction of the relationships.

Participants of the Study - The target population for this study comprises foreign laborers in industrial factories, in Eastern Thailand. A purposive sampling technique will be foreign laborers in industrial factories, in Eastern Thailand to select the sample, which means that participants will be chosen based on their relevance to the research objectives and their ability to provide valuable insights (Hair Jr. et al., 2017, cited in Nithipong, 2021). The study aims to collect data from 400 respondents using a structured questionnaire. In this study, 384 selected foreign laborers in industrial factories in Eastern Thailand were invited to participate using the Cochran method.

Instrument - This study utilized a structured questionnaire as the primary data-gathering instrument to examine the influence of work hours, job security, and workplace support on the job satisfaction of foreign laborers in Eastern Thailand's industrial sector. The questionnaire consisted of two main parts. The first part gathered relevant demographic information of the respondents, while the second part focused on measuring the key variables of the study, including work hours, job security, workplace support, and job satisfaction. The items in the questionnaire were measured using a 4-point Likert scale, which required respondents to indicate their level of agreement with each statement. The scale included the following responses: 4 – Strongly Agree, 3 – Agree, 2 – Disagree, and 1 – Strongly Disagree. This scaling method was used to eliminate a neutral response and encourage respondents to provide more definite answers. The responses were interpreted as very high, high, low, and very low levels, respectively. The questionnaire items were developed based on related literature and concepts to ensure content relevance and appropriateness to the study. Each variable was represented by a set of statements: work hours focused on workload and time schedules, job security examined stability and continuity of employment, workplace support assessed assistance from supervisors and coworkers, and job satisfaction measured employees' overall attitudes toward their work. The responses were assigned numerical values, and mean scores were computed to determine the level of each variable. Higher mean scores indicated higher levels of agreement and stronger presence of the measured factors.

Data Gathering Procedure - The study employed a survey questionnaire as the primary method for data collection. The instrument consisted of closed-ended questions designed to gather information on the personal characteristics of foreign laborers in industrial factories in Eastern Thailand, as well as key variables such as work hours, job security, workplace support, work-life balance, and job satisfaction. The use of closed-ended questions allowed for systematic data collection and facilitated quantitative analysis. Prior to the actual data collection, the questionnaire underwent pre-testing to identify potential issues in clarity, organization, and content. Necessary revisions were made based on feedback to improve the reliability and validity of the instrument. After finalizing the questionnaire, it was distributed to the selected respondents using appropriate sampling procedures. The collected data were then organized, coded, and analyzed using statistical tools to determine the relationships between the variables. The results of the analysis were used to generate meaningful insights regarding the influence of work hours, job security, and workplace support on the job satisfaction of foreign laborers in industrial factories in Eastern Thailand.

Data Analysis - The study uses descriptive statistics and inferential statistics as its main statistical tools. Descriptively, it reports weighted means, composite means, verbal interpretations, and ranks to summarize respondents' perceptions across work hours, job security, workplace support, and job satisfaction, while inferentially it uses Spearman-rho correlation (the data violates assumptions of normality and thus, non-parametric tests were used) to test relationships among variables and multiple regression/ANOVA to identify predictors of job satisfaction.

Ethical Considerations - Several ethical considerations will be taken into account to ensure the rights and well-being of the participants. These considerations align with established research ethics principles. Informed consent will be sought from all participants involved in the study. Participants will be provided with detailed information regarding the purpose of the research, the nature of their participation, and any potential risks or benefits. They will have freedom to voluntarily decide whether they want to participate in the study or withdraw at any time without facing any negative consequences. Confidentiality of the participants' information will be strictly maintained throughout the research process. All data collected will be treated as confidential and will only be accessible to the researcher and authorized personnel directly involved in the study. Data will be securely stored to prevent unauthorized access or disclosure. Data protection measures will be implemented to safeguard the participants' personal information. This includes ensuring that any identifiable information is anonymized or pseudonymized to maintain privacy. The data will be stored using secure methods and will be retained for the designated period as per relevant regulations. Additionally, the research will adhere to ethical guidelines and regulations set forth by relevant institutional review boards or ethics committees. These guidelines aim to ensure that research involving human participants upholds ethical standards and respects their rights and welfare. It is important to note that while the provided references are not directly cited in this paragraph, they serve as valuable resources for understanding the general principles of research ethics and ethical considerations in consumer and entrepreneurship of Electric Vehicles. Researchers are encouraged to consult these references for further insights into the topic and specific ethical guidelines in their respective fields.

3. Result and discussion

Table 1

Summary Table of Work Hours

Indicators	Weighted Mean	Verbal Interpretation	Rank
Compliance with Labor Standards	3.33	*Agree*	1
Standard Working Hours	3.20	*Agree*	4
Overtime Management	3.27	*Agree*	2.5
Flexibility of Work Schedules	3.27	*Agree*	2.5
OVERALL MEAN	3.27	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

Table 1 presents the Summary Table of Work Hours. The overall mean of 3.27 (Agree) indicates that respondents generally perceive the organization's work hour practices as satisfactory and compliant with established employment standards. This finding suggests that employees recognize that their organizations have implemented appropriate work hour policies that support day-to-day operations while maintaining compliance with labor regulations.

Among the four dimensions, Compliance with Labor Standards obtained the highest weighted mean of 3.33 (Agree), indicating that respondents perceive their organizations to consistently observe legal and institutional regulations governing working hours, rest periods, overtime compensation, and other employment standards. This finding reflects the organization's commitment to maintaining fair labor practices and protecting employee rights in accordance with applicable labor laws. Compliance with labor standards contributes significantly to employees' perceptions of fairness, organizational legitimacy, and job security because it assures workers that their employers uphold ethical employment practices. Moreover, organizations that consistently comply with labor regulations are more likely to establish positive employer-employee relationships, minimize labor disputes, and cultivate a culture of trust and accountability.

Meanwhile, Overtime Management and Flexibility of Work Schedules both obtained a weighted mean of 3.27 (Agree), ranking second. These findings suggest that respondents generally perceive overtime practices and scheduling flexibility to be reasonably well managed. Effective overtime management enables organizations to address operational demands without excessively burdening employees, while flexible work schedules provide workers with greater autonomy in balancing their professional responsibilities and personal commitments. Flexibility has become increasingly important in contemporary workplaces, particularly as organizations recognize the value of accommodating employees' diverse personal circumstances and promoting work-life integration. Employees who perceive greater flexibility often experience lower stress levels, improved psychological well-being, and stronger organizational commitment because they are better able to manage family responsibilities, personal obligations, and work demands simultaneously.

Standard Working Hours received the lowest weighted mean of 3.20 (Agree), although it remains within the "Agree" category. This finding suggests that while respondents generally consider their regular working hours to be acceptable, there are concerns regarding workload distribution, scheduling consistency, or the adequacy of working hours in supporting employee well-being. Employees may experience periods where workloads extend beyond standard hours, creating physical and mental fatigue despite formal compliance with labor regulations. The relatively lower rating may also reflect situations where employees perceive that staffing levels, task assignments, or operational demands require them to work beyond what they consider reasonable for maintaining productivity and personal well-being. Such conditions may gradually reduce employee satisfaction if not appropriately addressed through effective workforce planning and workload management.

From a theoretical perspective, these findings are supported by the Job Demands-Resources (JD-R) Theory, which explains that employee well-being depends on achieving an appropriate balance between job demands and the resources provided by the organization. Work hours represent an important job demand because excessive or poorly managed schedules can contribute to physical exhaustion and psychological strain. Conversely, organizational resources such as compliance with labor standards, flexible work schedules, and effective overtime management help employees cope with work demands, reduce stress, and maintain high levels of engagement. When organizations successfully balance operational requirements with employees' personal needs, they create a healthier work environment that promotes both employee well-being and organizational effectiveness.

Table 2

Summary Table of Job Security

Indicators	Weighted Mean	Verbal Interpretation	Rank
Promotion and Career Advancement	3.23	*Agree*	2
Income Stability and Appropriateness	3.23	*Agree*	2
Skill Development and Recognition	3.23	*Agree*	2
OVERALL MEAN	3.23	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

Table 2 presents the summary of respondents' perceptions regarding job security, including promotion and career advancement, income stability and appropriateness, and skill development and recognition. The overall mean of 3.23, interpreted as "Agree," indicates that foreign laborers generally experience a moderate level of job security. This suggests that employees feel relatively stable in their employment, although there is still room for improvement in strengthening long-term security and career development opportunities.

Notably, all three indicators—promotion and career advancement, income stability and appropriateness, and skill development and recognition—received identical mean scores and rankings. This uniformity indicates that job security is perceived consistently across its different dimensions. It reflects that organizations provide balanced support in terms of career growth, compensation, and development opportunities, although none of these areas strongly stand out as highly developed. The findings on promotion and career advancement suggest that employees perceive the presence of growth opportunities within the organization. Career advancement is an essential aspect of job security because it provides employees with a sense of future stability and motivation. In terms of income stability and appropriateness, the results indicate that employees generally feel that their compensation is stable and provides a certain level of financial security. Financial stability is a core component of job security, especially for foreign laborers who often rely on consistent income for daily needs and family support. Meanwhile, skill development and recognition highlight employees' perceptions of opportunities to improve their abilities and receive acknowledgment for their work. Continuous learning and recognition are essential for sustaining employability and enhancing job security in dynamic work environments.

Although all three dimensions were rated positively, the moderate level of agreement suggests that improvements are still needed. Organizations should strengthen career development programs, ensure equitable and competitive compensation, and provide more consistent recognition and training opportunities.

Table 3

Summary Table of Workplace Support

Indicators	Weighted Mean	Verbal Interpretation	Rank
Work Flexibility and Leave Benefits	3.11	*Agree*	3
Organizational Clarity and Stability	3.25	*Agree*	2
Supervisory and Career Support	3.29	*Agree*	1
OVERALL MEAN	3.22	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

Table 3 presents the overall assessment of workplace support, encompassing work flexibility and leave benefits, organizational clarity and stability, and supervisory and career support. The overall mean of 3.22 (Agree) indicates that foreign laborers generally perceive a moderate level of workplace support within their organizations. While this suggests that support mechanisms are present, it also implies that they may not be fully optimized or consistently experienced across all dimensions. Among the three indicators, supervisory and career support ranked highest, followed by organizational clarity and stability, while work flexibility and leave benefits ranked lowest. This distribution highlights that interpersonal and leadership-related support is perceived more strongly than structural or policy-based support systems. Such findings are consistent with existing literature, which emphasizes that immediate supervisory relationships often have the most direct and visible impact on employees' perceptions of support and satisfaction.

The prominence of supervisory and career support reflects the critical role of leadership in shaping employee experiences. Research has shown that supportive supervisory behavior—such as providing guidance, fair treatment, and career development opportunities—significantly enhances job satisfaction and organizational commitment (Jo et al., 2025). From the perspective of Leader-Member Exchange (LMX) theory, high-quality relationships between supervisors and employees foster trust, communication, and mutual respect, which directly influence employee engagement and performance. The findings suggest that supervisors in the studied organizations are relatively effective in fulfilling these roles, reinforcing the importance of leadership as a central component of workplace support.

The second-ranked indicator, organizational clarity and stability, indicates that employees perceive a moderate level of transparency and predictability within the organization. Clarity in roles, policies, and organizational direction is essential in reducing uncertainty and enhancing employee confidence. Empirical studies demonstrate that effective communication and organizational stability are positively associated with job satisfaction, as they help employees understand expectations and align their efforts with organizational goals (Nikolova et al., 2023). This also aligns with the principles of Organizational Support Theory, which suggests that employees develop stronger attachment and commitment to organizations that provide clear communication and a stable work environment.

Despite these positive perceptions, work flexibility and leave benefits ranked lowest, indicating a relative weakness in policy-based support. This suggests that, while some level of flexibility and leave provision exists, these benefits may be limited, less accessible, or inconsistently implemented. Research has consistently shown that flexible work arrangements and adequate leave policies are critical in promoting work-life balance, reducing stress, and enhancing overall job satisfaction (Çivilidağ et al., 2024; Ray et al., 2021). Moreover, inadequate access to such benefits can negatively impact employee well-being, particularly among workers in labor-intensive environments where physical and mental demands are high.

The differences across the three dimensions highlight an important insight: employees tend to value and perceive direct interpersonal support (from supervisors) more strongly than institutional or policy-based support mechanisms. However, both forms of support are essential and should function complementarily. While supervisors can provide immediate assistance and motivation, organizational systems—such as clear policies and flexible work arrangements—ensure consistency, fairness, and long-term sustainability of support. From a broader theoretical standpoint, these findings can be explained through the Job Demands–Resources (JD-R) model, where workplace support functions as a key resource that mitigates job demands. Supervisory support, organizational clarity, and flexible work policies collectively contribute to reducing stress and enhancing motivation. However, when one dimension—such as flexibility—is weaker, it may limit the overall effectiveness of workplace support systems.

Table 4

Summary Table of Job Satisfaction

Indicators	Weighted Mean	Verbal Interpretation	Rank
Satisfaction with Work Conditions	3.25	*Agree*	1
Compensation and Benefits	3.23	*Agree*	2
Job Fulfillment	3.22	*Agree*	3
OVERALL MEAN	3.23	Agree	

Legend: 4.00-3.50 (Strongly Agree), 3.49-2.50 (Agree), 2.29-1.50 (Disagree) and 1.49-1.00 (Strongly Disagree)

Table 4 presents the respondents' overall level of job satisfaction, focusing on three key dimensions: satisfaction with work conditions, compensation and benefits, and job fulfillment. The overall composite mean of 3.23 (Agree) indicates that foreign laborers generally experience a moderate level of job satisfaction. This suggests that while employees are satisfied with different aspects of their job, the level of satisfaction is not yet optimal and may still be influenced by both intrinsic and extrinsic limitations within the work environment.

The highest-ranked dimension, *"Satisfaction with work conditions"* (M = 3.25), indicates that employees perceive their work environment as generally acceptable and supportive. This finding is significant because working conditions—such as safety, facilities, and workload—are fundamental determinants of employee well-being. Research in occupational health consistently shows that safe and well-maintained working environments contribute positively to job satisfaction, reduce stress, and enhance productivity (Montuori et al., 2022). From a theoretical perspective, this aligns with Herzberg's Two-Factor Theory, where working conditions are considered "hygiene factors." While they may not strongly motivate employees, their absence can lead to dissatisfaction. The relatively higher score in this dimension suggests that the organization has managed to meet basic environmental expectations, thereby preventing dissatisfaction among workers.

The second-ranked dimension, *"Compensation and benefits"* (M = 3.23), reflects the importance of financial and material rewards in shaping job satisfaction. Although the respondents generally agree that compensation contributes positively to their satisfaction, the moderate rating suggests that the compensation system may not be perceived as fully equitable or sufficient. Empirical studies confirm that compensation has a direct and significant relationship with job satisfaction, particularly among employees in labor-intensive industries, where income plays a crucial role in meeting daily needs and supporting families (Watkins et al., 2022). Moreover, global workforce studies indicate that dissatisfaction with pay and benefits is one of the most common concerns among employees, even when other aspects of the job are rated positively (Pew Research Center, 2024). This suggests that while compensation systems are functional, improvements in fairness, transparency, and adequacy could further enhance employee satisfaction.

The lowest-ranked dimension, *"Job fulfillment"* (M = 3.22), highlights the relatively weaker influence of intrinsic factors such as meaning, pride, motivation, and personal accomplishment. Although still interpreted as "Agree," this result indicates that employees may experience limited intrinsic satisfaction compared to extrinsic aspects of their work. Research in organizational psychology emphasizes that meaningful work and a sense of purpose are critical drivers of long-term engagement and job satisfaction (Nikolova et al., 2023). The relatively lower score suggests that while employees perform their duties adequately, they may not fully experience deeper psychological fulfillment or motivation in their roles.

Table 5

Relationship Between Work Hours and Job Security

Work Hours	Spearman-rho	p-value	Interpretation
Compliance with Labor Standards			
Promotion and Career Advancement	-0.026	0.616	Not Significant
Income Stability and Appropriateness	-0.020	0.694	Not Significant
Skill Development and Recognition	-0.026	0.606	Not Significant
Job Security OVERALL	0.011	0.824	Not Significant
Standard Working Hours			
Promotion and Career Advancement	.638**	0.000	Significant
Income Stability and Appropriateness	.712**	0.000	Significant
Skill Development and Recognition	.697**	0.000	Significant
Job Security OVERALL	.736**	0.000	Significant
Overtime Management			
Promotion and Career Advancement	.860**	0.000	Significant
Income Stability and Appropriateness	.876**	0.000	Significant
Skill Development and Recognition	.677**	0.000	Significant
Job Security OVERALL	.841**	0.000	Significant
Flexibility of Work Schedules			
Promotion and Career Advancement	.661**	0.000	Significant
Income Stability and Appropriateness	.762**	0.000	Significant
Skill Development and Recognition	.618**	0.000	Significant
Job Security OVERALL	.699**	0.000	Significant
Work Hours Overall			
Promotion and Career Advancement	0.013	0.803	Significant
Income Stability and Appropriateness	0.023	0.655	Significant
Skill Development and Recognition	0.009	0.855	Significant
Job Security OVERALL	0.052	0.308	Significant

Table 5 presents the relationship between work hours and job security using Spearman's rho correlation. The results indicate a mixed pattern, where some dimensions of work hours show strong and significant relationships with job security, while others exhibit no significant association. This suggests that the influence of work hours on job security is not uniform, but depends on specific aspects such as scheduling, overtime practices, and flexibility.

As to Compliance with Labor Standards and Job Security, the findings show no significant relationship between compliance with labor standards and all dimensions of job security, with correlation coefficients close to zero. This indicates that adherence to labor regulations alone does not directly influence employees' perceptions of job security. This result may be explained by the fact that compliance with legal standards is often viewed as a baseline or minimum requirement, rather than a determinant of long-term security. Employees may perceive compliance as expected, but not necessarily as a factor that guarantees career advancement or financial stability. Research supports this interpretation, suggesting that while labor regulations are important for protecting workers' rights, they do not automatically enhance perceptions of job security unless accompanied by organizational support and development opportunities (Nikolova et al., 2023).

In terms of Standard Working Hours and Job Security, in contrast, standard working hours show strong, positive, and statistically significant relationships with all dimensions of job security. This indicates that well-structured and reasonable working hours are strongly associated with employees' perceptions of career advancement, income stability, and skill development. This finding is consistent with research demonstrating that predictable and manageable working hours contribute to psychological security and stability, which are essential components of job satisfaction and retention (Bae, 2024). From a theoretical perspective, this aligns with the Job Demands–Resources (JD-R) model, where stable working hours function as a job resource that reduces uncertainty and enhances employees' sense of control. When employees experience consistency in their schedules, they are more likely to perceive stability in their roles and future within the organization.

As to Overtime Management and Job Security, the results show very strong positive correlations between overtime management and job security, representing the strongest relationships observed in the table. These findings suggest that effective and fair management of overtime is a critical factor influencing employees' perceptions of security. When overtime is properly regulated—whether in terms of distribution, compensation, or necessity—it enhances trust in the organization and reinforces stability. Empirical studies confirm that excessive or poorly managed overtime can lead to stress, burnout, and reduced job satisfaction, while well-managed overtime practices contribute positively to employee retention and perceived security (Bae, 2024).

In terms of Flexibility of Work Schedules and Job Security, similarly, flexibility of work schedules demonstrates moderate to strong positive correlations with all dimensions of job security. This indicates that flexible work arrangements significantly enhance employees' perceptions of stability, career growth, and income security. Research supports this relationship, showing that flexible work arrangements increase work-life balance, reduce stress, and improve overall job satisfaction and retention (Çivilidağ et al., 2024). As to overall Work Hours and Job Security, the overall measure of work hours shows very weak correlations with job security, despite being marked as significant. Given the high p-values, these relationships should be interpreted as not practically significant. This suggests that when work hours are considered as a single aggregated variable, their relationship with job security becomes diluted. The strong relationships observed in specific dimensions (e.g., overtime management, flexibility) indicate that not all aspects of work hours contribute equally to job security.

Table 6 presents the relationship between work hours and workplace support using Spearman's rho correlation. The results reveal a complex and differentiated pattern, where certain dimensions of work hours demonstrate strong and statistically significant relationships with workplace support, while others show weak or non-significant associations. This indicates that the influence of work hours on workplace support is context-specific, depending largely on how working time is structured, managed, and communicated.

As to compliance with Labor Standards and Workplace Support, the results indicate no significant relationship between compliance with labor standards and most dimensions of workplace support, except for a weak negative relationship with organizational clarity and stability. This suggests that compliance with legal standards does not necessarily translate into employees perceiving higher levels of support. This finding reflects the idea that legal compliance represents a minimum requirement rather than a source of perceived organizational support. Employees may view compliance as an obligation rather than an added benefit. Research in organizational behavior supports this view, emphasizing that formal policies alone are insufficient to enhance perceived support unless accompanied by effective implementation and communication mechanisms (Nikolova et al., 2023). The slight negative relationship with organizational clarity may indicate that strict compliance procedures could sometimes introduce rigidity or bureaucratic processes, potentially limiting flexibility or responsiveness in organizational communication.

As to Standard Working Hours and Workplace Support, the findings show strong positive and statistically significant relationships between standard working hours and all dimensions of workplace support. This indicates that employees who perceive their working hours as reasonable and stable are more likely to report higher levels of workplace support. This result aligns with research demonstrating that predictable and manageable work schedules contribute significantly to employees' perceptions of organizational support and fairness (Bae, 2024). Stable working hours reduce uncertainty and allow employees to better plan their personal and professional lives, enhancing their sense of control and well-being.

Table 6

Relationship Between Work Hours and Workplace Support

Work Hours	Spearman-rho	p-value	Interpretation
Compliance with Labor Standards			
Work Flexibility and Leave Benefits	0.004	0.935	Not Significant
Organizational Clarity and Stability	-.101*	0.047	Significant
Supervisory and Career Support	0.090	0.079	Not Significant
Workplace Support OVERALL	0.052	0.305	Not Significant
Standard Working Hours			
Work Flexibility and Leave Benefits	.698**	0.000	Significant
Organizational Clarity and Stability	.582**	0.000	Significant
Supervisory and Career Support	.831**	0.000	Significant
Workplace Support OVERALL	.848**	0.000	Significant
Overtime Management			
Work Flexibility and Leave Benefits	.749**	0.000	Significant
Organizational Clarity and Stability	.886**	0.000	Significant
Supervisory and Career Support	.624**	0.000	Significant
Workplace Support OVERALL	.869**	0.000	Significant
Flexibility of Work Schedules			
Work Flexibility and Leave Benefits	.423**	0.000	Significant
Organizational Clarity and Stability	.836**	0.000	Significant
Supervisory and Career Support	.726**	0.000	Significant
Workplace Support OVERALL	.756**	0.000	Significant
Work Hours Overall			
Work Flexibility and Leave Benefits	0.037	0.466	Not Significant
Organizational Clarity and Stability	-0.059	0.245	Not Significant
Supervisory and Career Support	.126*	0.014	Significant
Workplace Support OVERALL	0.095	0.063	Not Significant

As to Overtime Management and Workplace Support, the results indicate very strong positive relationships between overtime management and workplace support, with particularly high correlations observed with organizational clarity and overall workplace support. This suggests that effective management of overtime—such as fair allocation, proper compensation, and adequate rest—plays a critical role in shaping employees' perceptions of support. When overtime is well-regulated, employees perceive the organization as fair, transparent, and concerned about their well-being. Empirical research confirms that poorly managed overtime leads to stress and dissatisfaction, while fair and transparent overtime practices enhance organizational trust and employee engagement (Bae, 2024). Additionally, clear communication of overtime policies contributes to organizational clarity and strengthens employees' confidence in management practices.

In terms of Flexibility of Work Schedules and Workplace Support, similarly, flexibility of work schedules shows moderate to strong positive correlations with all dimensions of workplace support. This indicates that flexible scheduling significantly enhances employees' perceptions of support, particularly in terms of organizational clarity and supervisory support. This finding is consistent with research showing that flexible work arrangements improve work-life balance, reduce stress, and enhance employee satisfaction and organizational commitment (Çivilidağ et al., 2024). Flexible schedules provide employees with autonomy, which is a key factor influencing perceived organizational support. From a theoretical standpoint, this aligns with Self-Determination Theory (SDT), where autonomy is a fundamental psychological need. When employees are given flexibility in managing their time, they are more likely to perceive their work environment as supportive and responsive to their needs.

Finally, the Overall Work Hours and Workplace Support, it shows that generally weak and mostly non-significant relationships with workplace support, except for a small but significant relationship with supervisory and career support. This suggests that when work hours are aggregated into a single construct, their relationship with workplace support becomes less meaningful. The weak correlations indicate that not all aspects of work hours equally influence perceptions of support, and aggregation may obscure the effects of more critical dimensions such as overtime management and flexibility.

Table 7

Relationship Between Work Hours and Job Satisfaction

Work Hours	Spearman-rho	p-value	Interpretation
Compliance with Labor Standards			
Satisfaction with Work Conditions	0.068	0.182	Not Significant
Compensation and Benefits	0.010	0.849	Not Significant
Job Fulfillment	0.003	0.954	Not Significant
Job Satisfaction OVERALL	0.070	0.172	Not Significant
Standard Working Hours			
Satisfaction with Work Conditions	.721**	0.000	Significant
Compensation and Benefits	.824**	0.000	Significant
Job Fulfillment	.667**	0.000	Significant
Job Satisfaction OVERALL	.779**	0.000	Significant
Overtime Management			
Satisfaction with Work Conditions	.651**	0.000	Significant
Compensation and Benefits	.760**	0.000	Significant
Job Fulfillment	.717**	0.000	Significant
Job Satisfaction OVERALL	.728**	0.000	Significant
Flexibility of Work Schedules			
Satisfaction with Work Conditions	.459**	0.000	Significant
Compensation and Benefits	.469**	0.000	Significant
Job Fulfillment	.565**	0.000	Significant
Job Satisfaction OVERALL	.488**	0.000	Significant
Work Hours Overall			
Satisfaction with Work Conditions	.101*	0.047	Significant
Compensation and Benefits	0.046	0.368	Not Significant
Job Fulfillment	0.038	0.454	Not Significant
Job Satisfaction OVERALL	.106*	0.038	Significant

Table 7 presents the relationship between work hours and job satisfaction using Spearman's rho correlation. The results reveal a clear and differentiated pattern, where certain dimensions of work hours demonstrate strong positive and statistically significant relationships with job satisfaction, while others exhibit weak or non-significant associations. This suggests that job satisfaction is influenced not by work hours in general, but by how work hours are structured, managed, and experienced by employees.

In terms of Compliance with Labor Standards and Job Satisfaction, the results indicate no significant relationship between compliance with labor standards and all dimensions of job satisfaction. The correlation coefficients are weak and close to zero, suggesting that compliance alone does not strongly influence employees' satisfaction. This finding reflects that compliance with labor laws is often perceived as a basic requirement rather than a motivating factor. Employees may expect organizations to follow legal standards, but such compliance does not necessarily enhance satisfaction unless it is accompanied by meaningful improvements in work conditions and experiences. Empirical studies in organizational behavior support this interpretation, emphasizing that formal policies alone have limited impact on job satisfaction unless employees perceive real benefits in their day-to-day work environment (Nikolova et al., 2023). Thus, compliance functions more as a hygiene factor under Herzberg's theory—preventing dissatisfaction but not actively promoting satisfaction.

As to Standard Working Hours and Job Satisfaction, in contrast, standard working hours show strong positive and highly significant relationships with all dimensions of job satisfaction indicating that employees who perceive their working hours as reasonable and well-structured are more likely to be satisfied with their work conditions, compensation, and overall job experience. This finding is strongly supported by empirical research demonstrating that predictable work schedules and balanced workloads enhance employee well-being, reduce stress, and improve satisfaction (Bae, 2024). Consistent working hours provide stability and allow employees to manage personal responsibilities effectively, contributing to a more positive work experience.

As to Overtime Management and Job Satisfaction, the results show moderate to strong positive correlations between overtime management and all dimensions of job satisfaction suggesting that the way overtime is handled plays significant role in shaping employees' attitudes toward their jobs. Effective overtime management characterized by fairness, transparency, and proper compensation enhances satisfaction by reinforcing organizational trust. Poorly managed overtime can lead to fatigue, stress, and dissatisfaction. Research confirms that excessive or mandatory overtime is associated with lower job satisfaction and higher turnover intentions, while well-managed overtime contributes to employee engagement and retention (Bae, 2024).

In terms of Flexibility of Work Schedules and Job Satisfaction, the dimension of flexibility of work schedules shows moderate, positive, and statistically significant relationships with job satisfaction. This indicates that flexible work arrangements contribute positively to satisfaction, though to a lesser extent compared to standard hours and overtime management. Research supports this relationship, showing that flexible scheduling enhances work-life balance, reduces stress, and increases employee satisfaction and engagement (Çivilidağ et al., 2024). Flexible arrangements allow employees to adjust their work schedules to personal needs, fostering a sense of autonomy.

Finally, the Overall Work Hours and Job Satisfaction shows weak but statistically significant relationships with satisfaction with work conditions ($\rho = .101$, $p < 0.05$) and overall job satisfaction ($\rho = .106$, $p < 0.05$), while relationships with compensation and job fulfillment are not significant. This suggests that aggregated work hours have only a limited influence on job satisfaction. The weak correlations indicate that combining different aspects of work hours into a single variable may obscure their individual effects. This reinforces the observation that specific dimensions of work hours (e.g., scheduling, overtime, flexibility) are more important determinants of job satisfaction than total working hours alone.

Table 8

Relationship Between Job Security and Workplace Support

Work Hours	Spearman-rho	p-value	Interpretation
Promotion and Career Advancement			
Work Flexibility and Leave Benefits	.823**	0.000	Significant
Organizational Clarity and Stability	.805**	0.000	Significant
Supervisory and Career Support	.548**	0.000	Significant
Workplace Support OVERALL	.840**	0.000	Significant
Income Stability and Appropriateness			
Work Flexibility and Leave Benefits	.732**	0.000	Significant
Organizational Clarity and Stability	.929**	0.000	Significant
Supervisory and Career Support	.667**	0.000	Significant
Workplace Support OVERALL	.903**	0.000	Significant
Skill Development and Recognition			
Work Flexibility and Leave Benefits	.693**	0.000	Significant
Organizational Clarity and Stability	.589**	0.000	Significant
Supervisory and Career Support	.634**	0.000	Significant
Workplace Support OVERALL	.757**	0.000	Significant
Job Security Overall			
Work Flexibility and Leave Benefits	.851**	0.000	Significant
Organizational Clarity and Stability	.778**	0.000	Significant
Supervisory and Career Support	.667**	0.000	Significant
Workplace Support OVERALL	.902**	0.000	Significant

Table 8 presents the relationship between job security and workplace support using Spearman's rho correlation analysis. The results consistently show strong, positive, and statistically significant relationships across all dimensions ($\rho = .548$ to $.929$, $p < .001$), indicating that job security is closely associated with employees' perceptions of workplace support. This suggests that employees who feel secure in their jobs are more likely to perceive their work environment as supportive, stable, and responsive to their needs.

As to Promotion and Career Advancement and Workplace Support, results show strong and significant positive correlations between promotion and career advancement and all aspects of workplace support. The strongest relationships are observed with: Work flexibility and leave benefits; Organizational clarity and stability; Overall workplace support. Findings indicate that employees who perceive greater opportunities for advancement also perceive higher levels of support from their organization. This is consistent with research demonstrating that career growth opportunities significantly enhance perceptions of organizational support and employee engagement (Widodo et al.,2023). From a theoretical perspective, this aligns with Organizational Support Theory (OST), which suggests that employees interpret organizational actions such as promotion opportunities as signals of support and investment in their development. When organizations provide clear career paths, employees are more likely to feel valued and supported, increasing their satisfaction and commitment.

As to Income Stability and Appropriateness and Workplace Support, the findings reveal very strong positive correlations between income stability and workplace support, with particularly high relationships observed with: Organizational clarity and stability, Overall workplace support. These results indicate that employees who experience stable and adequate income are highly likely to perceive their organization as supportive. Among all dimensions, this relationship appears to be one of the strongest, suggesting that financial security is a central driver of perceived workplace support. Empirical studies confirm that stable income reduces stress, enhances well-being, and strengthens employees' trust in their organization, thereby increasing overall job satisfaction and organizational commitment (Montuori et al., 2022).

As to Skill Development and Recognition and Workplace Support, the results also show moderate to strong positive relationships between skill development and workplace support. The strongest relationship is observed with overall workplace support. This indicates that employees who perceive opportunities for training, skill enhancement, and recognition are more likely to experience a supportive workplace environment. Research supports this finding, emphasizing that training and development initiatives serve as key indicators of organizational support and positively influence employee satisfaction and retention (Hutagi et al., 2023). Furthermore, recognition plays an essential role in reinforcing employee value and motivation. Studies show that employees who feel recognized are more engaged and more likely to perceive their organization as supportive (Jo et al., 2025).

As to Overall Job Security and Workplace Support, The overall results show very strong positive correlations between overall job security and all dimensions of workplace support, with the strongest relationship observed with: Overall workplace support. This indicates a high degree of interdependence between job security and workplace support. Employees who feel secure in their jobs tend to perceive their workplace as more supportive, while those who experience strong organizational support are more likely to feel secure in their employment. This reciprocal relationship is well-supported in organizational research. Studies show that supportive work environments enhance employees' sense of security, while job security strengthens trust and positive perceptions of the organization (Nikolova et al., 2023).

Table 10 presents the relationship between workplace support and job satisfaction, showing moderate to strong positive and statistically significant relationships across all dimensions. This indicates that workplace support plays a significant and consistent role in enhancing job satisfaction, although the strength of the relationships varies depending on the type of support. The strongest relationships are observed in work flexibility and leave benefits, particularly with job fulfillment and overall job satisfaction. This suggests that employees who perceive greater flexibility and access to leave benefits are more likely to find their work meaningful, satisfying, and balanced. These findings align with research indicating that flexible work arrangements enhance work-life balance, reduce stress, and improve overall employee well-being and satisfaction. From the perspective of Self-Determination Theory (SDT), flexibility supports autonomy, which is a key driver of intrinsic motivation and satisfaction.

Table 9

Relationship Between Job Security and Job Satisfaction

Work Hours	Spearman-rho	p-value	Interpretation
Promotion and Career Advancement			
Satisfaction with Work Conditions	$.713^{**}$	0.000	Significant
Compensation and Benefits	$.707^{**}$	0.000	Significant
Job Fulfillment	$.865^{**}$	0.000	Significant
Job Satisfaction OVERALL	$.775^{**}$	0.000	Significant

Income Stability and Appropriateness			
Satisfaction with Work Conditions	.608**	0.000	Significant
Compensation and Benefits	.717**	0.000	Significant
Job Fulfillment	.640**	0.000	Significant
Job Satisfaction OVERALL	.679**	0.000	Significant
Skill Development and Recognition			
Satisfaction with Work Conditions	.934**	0.000	Significant
Compensation and Benefits	.844**	0.000	Significant
Job Fulfillment	.850**	0.000	Significant
Job Satisfaction OVERALL	.922**	0.000	Significant
Job Security Overall			
Satisfaction with Work Conditions	.865**	0.000	Significant
Compensation and Benefits	.839**	0.000	Significant
Job Fulfillment	.868**	0.000	Significant
Job Satisfaction OVERALL	.901**	0.000	Significant

Table 10

Relationship Between Workplace Support and Job Satisfaction

Work Hours	Spearman-rho	p-value	Interpretation
Work Flexibility and Leave Benefits			
Satisfaction with Work Conditions	.724**	0.000	Significant
Compensation and Benefits	.728**	0.000	Significant
Job Fulfillment	.766**	0.000	Significant
Job Satisfaction OVERALL	.789**	0.000	Significant
Organizational Clarity and Stability			
Satisfaction with Work Conditions	.493**	0.000	Significant
Compensation and Benefits	.617**	0.000	Significant
Job Fulfillment	.609**	0.000	Significant
Job Satisfaction OVERALL	.573**	0.000	Significant
Supervisory and Career Support			
Satisfaction with Work Conditions	.566**	0.000	Significant
Compensation and Benefits	.594**	0.000	Significant
Job Fulfillment	.522**	0.000	Significant
Job Satisfaction OVERALL	.578**	0.000	Significant
Workplace Support Overall			
Satisfaction with Work Conditions	.699**	0.000	Significant
Compensation and Benefits	.766**	0.000	Significant
Job Fulfillment	.754**	0.000	Significant
Job Satisfaction OVERALL	.764**	0.000	Significant

The dimension of organizational clarity and stability shows moderate correlations, indicating that clear policies and stable organizational structures contribute positively to job satisfaction, though to a lesser extent compared to flexibility. Employees who understand organizational expectations and perceive stability are more likely to feel secure and satisfied. This aligns with Organizational Support Theory (OST), which emphasizes that transparency and consistency in organizational practices enhance employees' trust and satisfaction. Similarly, supervisory and career support demonstrates moderate positive relationships, indicating that support from supervisors contributes to job satisfaction, particularly in terms of work conditions and compensation perceptions. Supervisory guidance, fair treatment, and career support enhance employees' experiences by providing direction and reinforcing their value within the organization. However, the relatively moderate strength suggests that while supervisory support is important, it may not be as influential as broader structural supports such as flexibility.

The overall workplace support measure shows strong correlations with all job satisfaction dimensions, confirming that workplace support as a whole is a significant predictor of job satisfaction. The strongest relationship is observed with compensation and benefits, suggesting that supportive workplace practices also influence how employees perceive fairness and adequacy of rewards. When compared to Table 9 (job security), the relationships in Table 10 are slightly weaker, indicating that while workplace support is important, job security has a more substantial impact on job satisfaction. This suggests that employees prioritize stability and security more strongly, although supportive work environments still play a critical complementary role. From a theoretical perspective, these findings support the Job Demands–Resources (JD-R) model, where workplace support acts as a key job resource that reduces stress and enhances engagement. Additionally, Organizational Support Theory (OST) explains that employees who perceive high levels of support from their organization are more likely to develop positive attitudes and greater satisfaction.

Research Output

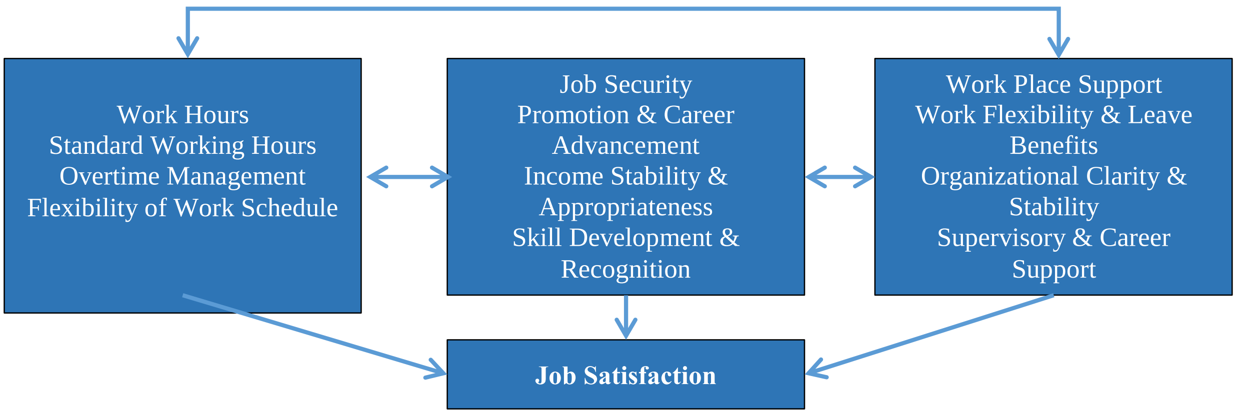

Figure 1. Proposed Framework for Enhanced Job Satisfaction of Foreign Laborers in Eastern Thailand's Industrial Sector

The proposed framework illustrates that job satisfaction among foreign laborers in Eastern Thailand's industrial sector is influenced by three interrelated constructs: work hours, job security, and workplace support, all of which collectively shape employee outcomes. Work hours—comprising standard working hours, overtime management, and flexibility of work schedules—directly affect employees' daily work experiences and overall satisfaction. From the perspective of the Job Demands–Resources (JD-R) model, work hours can function either as job demands or job resources depending on how they are managed; excessive workloads and poorly regulated hours increase stress and reduce satisfaction, while balanced and predictable schedules enhance well-being and engagement. Job security, which includes promotion and career advancement, income stability, and skill development and recognition, occupies a central role in the framework, reflecting its dual function as both a direct determinant of job satisfaction and a key factor linked to work conditions and organizational practices. Empirical research consistently shows that job security is strongly associated with employee attitudes such as job satisfaction, commitment, and well-being, while job insecurity negatively affects psychological outcomes and engagement. Workplace support, encompassing work flexibility and leave benefits, organizational clarity and stability, and supervisory and career support, represents the broader organizational environment that shapes how employees perceive their value and well-being.

According to Organizational Support Theory (OST), when employees perceive that their organization values their contributions and cares about their welfare, they are more likely to report higher levels of job satisfaction and commitment. Moreover, the framework highlights that these three variables are interconnected rather than independent, suggesting that improvements in work hour management can enhance perceptions of job security, while strong workplace support reinforces both security and satisfaction. For instance, flexible scheduling and supportive leadership practices increase employees' sense of control and stability, which are essential for motivation and satisfaction. This relationship is further supported by Self-Determination Theory (SDT), which posits that employee well-being and job satisfaction are driven by the fulfillment of three basic psychological needs—autonomy, competence, and relatedness—and that supportive and flexible work environments promote these needs, leading to higher engagement and satisfaction. Additionally, the framework aligns with Herzberg's Two-Factor Theory, which distinguishes between hygiene factors (e.g., working conditions, salary, and job security) that prevent dissatisfaction and motivators (e.g., recognition, growth, and meaningful work) that actively enhance satisfaction; this explains why job security and workplace support function not only as protective factors but also as drivers of positive employee experiences.

Overall, the model emphasizes that job satisfaction is a multidimensional construct that emerges from the interaction of structural work conditions, perceived employment stability, and organizational support systems. Work hours influence the immediate work environment, job security provides long-term psychological stability, and workplace support enhances the quality of organizational relationships and practices. The convergence of these factors toward job satisfaction suggests that enhancing employee outcomes requires a holistic and integrated approach. Organizations must therefore go beyond compliance with labor standards and adopt employee-centered strategies that balance work demands with adequate resources, ensure stable and fair employment conditions, and foster a supportive organizational climate. By addressing these interconnected dimensions simultaneously, organizations can significantly improve job satisfaction, well-being, and retention among foreign laborers in the industrial sector.

4. Conclusions and recommendations

The respondents perceive work hour arrangements positively, particularly regarding compliance with labor standards. The respondents moderately agree of their job security in terms of promotion and career advancement, income stability and appropriateness, and skill development and recognition. The respondents moderately agree on the workplace support they receive in terms of work flexibility and leave benefits, organizational clarity and stability, and supervisory and career support, Work-life balance, and job satisfaction among foreign laborers. The respondents moderately agree on the job satisfaction in terms of: satisfaction with work conditions, compensation and benefits, and job fulfillment. There is significant relationships among Work Hours, Job Security, and Workplace Support on Job Satisfaction. The variables such as Work Hours, Job Security, and Workplace Support are considered predictors of Job Satisfaction among foreign workers in industrial sector. A framework is proposed for an enhanced Job Satisfaction of Foreign Laborers in Eastern Thailand's Industrial Sector.

The employers may provide clear promotion opportunities, stable income, and continuous skill development programs to enhance employees' sense of security and satisfaction in the workplace. The companies may invest in training, career development, and employee recognition programs to increase motivation and fulfillment. The companies may should adopt comprehensive human resource strategies that simultaneously address work hours, job security, and workplace support to achieve higher levels of job satisfaction among foreign laborers. Future researchers may examine additional factors such as organizational culture, leadership style, employee well-being, and work-life balance that may influence job satisfaction. The companies may use the proposed framework to enhance the job satisfaction among foreign laborers.

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Mobile applications, artificial intelligence integration, and teacher digital competency as drivers of instructional efficacy

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Abstract

This study examined mobile applications, artificial intelligence (AI) integration, and teacher digital competency as drivers of instructional efficacy. Specifically, it assessed the level of utilization of mobile applications in instruction in terms of instructional support, collaboration and communication, and learner engagement and motivation. It also examined the extent of AI integration in instruction in terms of personalized learning, automated assessment, data analytics, and administrative support. In addition, the study evaluated teachers' digital competency in terms of professional engagement, empowering learners, and facilitating learners' digital competence. Instructional efficacy was assessed in terms of instructional planning effectiveness, classroom engagement effectiveness, and learning outcome achievement. The study further determined the relationships among mobile applications, AI integration, teacher digital competency, and instructional efficacy, as well as identified which factors significantly predict instructional efficacy. A descriptive-correlational research design was employed, utilizing a structured questionnaire to gather data from 384 respondents. Statistical tools were used to describe the variables, test relationships, and determine predictors of instructional efficacy. Findings of the study are expected to provide empirical evidence on how digital tools and teacher competencies contribute to effective instruction. Based on the results, an action plan is proposed to enhance instructional efficacy through the optimized use of mobile applications, artificial intelligence, and strengthened teacher digital competency.

Keywords: mobile applications, artificial intelligence integration, teacher digital competency, instructional efficacy

Mobile applications, artificial intelligence integration, and teacher digital competency as drivers of instructional efficacy

1. Introduction

In the rapidly evolving digital era, information and communication technology (ICT) continues to reshape educational systems worldwide. The integration of mobile applications and artificial intelligence (AI) has become increasingly central to teaching and learning processes, requiring educators to adapt their pedagogical approaches and technological competencies. Studies highlight that the effective use of AI and digital tools in education is closely linked to teachers' digital competence, which encompasses the knowledge, skills, and attitudes needed to integrate technology meaningfully into instruction (Redecker et al., 2022; UNESCO, 2023). AI, defined as systems capable of performing tasks that typically require human intelligence such as learning, reasoning, and problem-solving, has significantly advanced in recent years and is widely applied across sectors, including education (Luckin et al., 2022). AI enables personalized learning, intelligent tutoring systems, automated assessment, and predictive analytics that support student success. These capabilities can enhance instructional efficacy by allowing teachers to tailor learning experiences, monitor student progress in real time, and reduce administrative workload (Holmes et al., 2022; Chen et al., 2023).

Alongside AI, mobile applications have emerged as powerful tools for facilitating interactive, flexible, and student-centered learning environments. Mobile learning applications enable access to educational resources anytime and anywhere, fostering engagement, collaboration, and self-directed learning among students (Hwang et al., 2022). These applications also provide features for assessment, feedback, and content delivery, thereby supporting teachers in improving instructional design and implementation. However, the successful integration of AI and mobile applications in education largely depends on teachers' digital competence. Teachers with high levels of digital competence are better equipped to design innovative learning activities, evaluate digital resources, and effectively integrate emerging technologies into their teaching practice (Caena et al., 2022). Conversely, insufficient digital skills remain a major barrier to technology integration in classrooms, particularly in developing regions.

In Thailand, national education policies emphasize the importance of digital transformation and the development of 21st-century skills among learners. Teachers are expected to act as facilitators of learning who can leverage digital technologies, including AI and mobile applications, to enhance student outcomes and foster lifelong learning (Office of the Education Council, 2022). Despite these policy directions, disparities in digital competence and access to emerging technologies persist across regions. Phitsanulok Province, as a key educational hub in northern Thailand, reflects both the opportunities and challenges associated with technology integration in education. While schools increasingly adopt digital tools, many teachers still require further development in digital competence to fully utilize AI and mobile applications for effective instruction. Addressing this gap is essential to improving instructional efficacy and ensuring equitable access to quality education.

This study investigates the role of mobile applications, artificial intelligence integration, and teacher digital competence as drivers of instructional efficacy within the educational district of Phitsanulok Province. By examining how these factors interact and contribute to teaching effectiveness, the findings aim to provide empirical evidence that can inform educational policy, teacher professional development, and technology integration strategies in Thailand and similar contexts. Ultimately, the study seeks to support the advancement of innovative, technology-enhanced teaching practices that improve student learning outcomes in the digital age.

Objectives of the Study - This study aims to determine how mobile applications, artificial intelligence, and teacher digital competency serve as drivers of instructional efficacy. Specifically, it aims to assess the level of utilization of mobile applications in instruction in terms of instructional support, collaboration and communications, learner engagement and motivation; examine the extent of integration of artificial intelligence in instruction in terms of personalized learning, automated assessment, and data analytics; and administrative support; evaluate the digital competency of teachers in terms of professional engagement, empowering learners, and facilitating learner's digital competence; assess the level of instructional efficacy in terms of: instructional planning effectiveness classroom engagement effectiveness; learning outcome achievement; test the relationship between mobile applications, artificial intelligence, and teacher digital competency; determine which factors significantly predict instructional efficacy; propose Action plan for enhancing instructional efficacy through the effective use of mobile applications, artificial intelligence, and teacher digital competency.

2. Methods

Research Design - The researcher used a quantitative research design to assess, analyze, and evaluate the questionnaire responses in a way that would provide the researcher with reasonable evidence and conclusions about the integration of artificial intelligence (AI) applications and teachers' digital competence in teaching. Of teachers in Phitsanulok Province, Thailand, and the factors affecting the achievement of the integration of artificial intelligence (AI) applications and teachers' digital competence. The target group of the research participants was 8,935 in the Educational District of Phitsanulok Province, Thailand (Teacher and Educational Personnel Data, Ministry of Education, 2024). Purposive sampling must be teachers or educational personnel in Phitsanulok Province, Thailand. Further research on the strategy from collecting data in-depth will help to obtain representatives of teachers and educational personnel in Phitsanulok Province, Thailand.

Participants of the Study - The target population for this study consisted of teachers in Phitsanulok Province, Thailand. The study aimed to collect data from 384 respondents using a structured questionnaire following the Cochran's formula. It is especially ideal when your target population is large or unknown

Data Gathering Instruments - The questionnaire will be pre-tested with a group of teachers and educational personnel involved in the integration of mobile applications, artificial intelligence, and digital competence in teaching to ensure the clarity and validity of the questions. As each item is given feedback, it needs to be adjusted appropriately. After that, the final questionnaire will be distributed to the target group of teachers of the integration of mobile applications, artificial intelligence, and digital competence in teaching in the educational area of Phitsanulok Province, Thailand. There will be several methods to reach the sample group, such as directly reaching teachers and educational personnel in schools, using networks and professional associations, and using online platforms. To increase the response rate, there may be the introduction of incentives or rewards, and the guarantee of confidentiality and anonymity to promote honesty and unbiased responses.

Once the data collection is complete, statistical analysis techniques will be used to analyze the relationship between personal characteristics and factors related to the integration of mobile applications, artificial intelligence, and digital competence in teaching. This analysis will provide insights into the factors influencing the success of educational outcomes from the integration of mobile applications, artificial intelligence, and digital competence of teachers in teaching.

The questionnaire consisted of 4 sections: Section I: Perceived impact of government and administrator support benefits. Section II: Environmental awareness factors; Section III: Infrastructure factors of mobile applications, artificial intelligence, and digital competence in teaching; Section IV: Integration of mobile applications, artificial intelligence, and digital competence in teaching of teachers in the educational area of Phitsanulok Province, Thailand.

Data Gathering Procedure - The data collection method used in this study was a survey questionnaire. The questionnaire consisted of closed-ended questions that were used to collect data on the personal characteristics of teachers and educational personnel and related factors, such as the impact of government and administrator support benefits and the adoption of mobile applications, artificial intelligence, and digital competence in teaching and learning management of teachers in Phitsanulok Province, Thailand. The questionnaire will be designed according to relevant literature and conceptual frameworks, including the constructs and dimensions identified in previous research, and will be inspired by studies that have examined the personal characteristics, related factors, and teachers and educational personnel who use mobile applications, artificial intelligence, and digital competence in teaching in various contexts. In addition, the results of the data analysis can be used to generate useful recommendations and implications for teachers and educational personnel who use mobile applications, artificial intelligence, and digital competence in teaching and learning management, as well as policymakers and other stakeholders in the education sector. The insights gained from the study can help develop approaches and interventions aimed at promoting teacher development and increasing success in education in Phitsanulok Province, Thailand.

Data Analysis - Data analysis for this study will use a combination of descriptive and inferential statistical techniques. Inferential statistical techniques will be used to examine the relationship and effects of personal characteristics, factors related to the integration of mobile applications, artificial intelligence, and digital competence of teachers in teaching in the Phitsanulok Provincial Education Area. These techniques will help determine the significance and strength of these relationships. Pearson correlation coefficient analysis allow the examination of multiple independent variables simultaneously.

Ethical Considerations - This study adhered to established research ethics principles to protect the rights and well-being of all participants. Informed consent was obtained after participants were provided with information about the study's purpose, procedures, and any potential risks or benefits. Participation was voluntary, and participants could withdraw at any time without penalty. All collected data were kept confidential and securely stored, with personal information anonymized to protect participants' privacy. Data were accessible only to the researchers and authorized personnel and were retained in accordance with applicable data protection regulations. Furthermore, the study complied with the ethical guidelines and requirements of the appropriate institutional review board or ethics committee to ensure respect for participants' rights and welfare.

3. Results and discussions

Table 1

Summary Table on Mobile Applications in Instruction

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Instructional Support	3.30	Agree	2
2. Collaboration and Communication	3.18	Agree	3
3. Learner Engagement and Motivation	3.32	Agree	1
Composite Mean	3.26	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 1 presents the summary of respondents' assessment of mobile applications in instruction across three dimensions: instructional support, collaboration and communication, and learner engagement and motivation. Composite mean of 3.26, interpreted as *Agree*, indicates that respondents generally perceive mobile applications as effective tools in supporting various aspects of instruction. This finding is consistent with recent literature which emphasizes that mobile technologies contribute significantly to improving teaching practices, enhancing learning environments, and supporting flexible instructional delivery (Zou et al., 2025; Li et al., 2024).

Among the three indicators, *"Learner Engagement and Motivation"* ranked first with a weighted mean of 3.32 (*Agree*). This suggests that respondents consider mobile applications to be most effective in enhancing students' interest, participation, and overall motivation in learning activities. This aligns with recent research which highlights that mobile and digital tools create interactive and engaging learning experiences that increase student motivation and active participation (World Economic Forum, 2024; Zou et al., 2025). The second-highest indicator, *"Instructional Support"*, obtained a weighted mean of 3.30 (*Agree*). This indicates that mobile applications play a significant role in assisting teachers in organizing content, managing instructional activities, and delivering lessons effectively. Studies confirm that mobile technologies improve instructional efficiency by enabling teachers to streamline teaching processes and manage learning activities more effectively (Cengage Group, 2024).

"Collaboration and Communication" ranked third with a weighted mean of 3.18 (*Agree*). Although still positively perceived, this suggests that the use of mobile applications for communication and collaboration may not be fully maximized compared to other instructional aspects, consistent with findings that while mobile platforms provide opportunities for interaction and collaboration, their effectiveness largely depends on teachers' digital competence and strategic integration of collaborative tools (Xue et al., 2025; Zou et al., 2025).

Table 2

Summary Table on Artificial Intelligence in Instruction

Indicators	Weighted Mean	Verbal Interpretation	Rank
Personalized Learning	3.23	Agree	2
Automated Assessment	3.23	Agree	2
Data Analytics and Administrative Support	3.23	Agree	2
Composite Mean	3.23	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 2 presents the summary of respondents' assessment of artificial intelligence (AI) in instruction across three dimensions: personalized learning, automated assessment, and data analytics and administrative support. All three indicators obtained an identical weighted mean of 3.23, interpreted as *Agree*, resulting in a composite mean of 3.23. This indicates that respondents generally perceive AI as a useful tool across multiple instructional functions, without significant variation among dimensions. This is consistent with recent literature which emphasizes that AI technologies contribute holistically to teaching and learning processes by supporting personalization, assessment, and data-driven decision-making (World Economic Forum, 2024; Zou et al., 2025).

The equal ranking of the three dimensions suggests that respondents view AI as equally beneficial in enhancing various aspects of instruction. In terms of personalized learning, AI enables teachers to tailor instruction based on students' individual needs, learning preferences, and performance levels. Studies show that AI-powered systems facilitate adaptive learning experiences that improve engagement and academic outcomes (World Economic Forum, 2024). Similarly, automated assessment is recognized as an important contribution of AI in instruction. AI technologies support efficient grading, consistent evaluation, and timely feedback, which help improve teaching efficiency and student learning. Research indicates that automated assessment tools reduce teachers' workload while maintaining accuracy and reliability in evaluation processes (Cengage Group, 2024; Zou et al., 2025).

In addition, data analytics and administrative support play a crucial role in enhancing instructional effectiveness. AI-driven analytics allow teachers to monitor student progress, identify learning gaps, and make data-informed decisions. These tools also assist in managing classroom records and administrative tasks more efficiently. This aligns with findings that AI analytics support evidence-based teaching practices and improve overall instructional planning (World Economic Forum, 2024). The uniformity in the ratings may also suggest that while AI is recognized for its benefits, its implementation across these areas is still developing, leading to similar levels of perception among respondents. This observation is supported by studies indicating that the effectiveness of AI in education depends on factors such as teacher digital competence, access to technology, and institutional support (Xue et al., 2025).

Table 3 presents the summary of respondents' assessment of teacher digital competency across three dimensions: professional engagement, empowering learners, and facilitating learners' digital competence. The composite mean of 3.22 (*Agree)*, indicates that respondents generally perceive themselves as possessing a satisfactory level of digital competency in supporting teaching and learning processes, consistent with recent studies highlighting that teachers' digital competence plays a crucial role in enhancing instructional practices and student learning outcomes in technology-integrated environments (Zou et al., 2025; Xue et al., 2025).

Table 3

Summary Table on Teacher Digital Competency

Indicators	Weighted Mean	Verbal Interpretation	Rank
Professional Engagement	3.12	Agree	3
Empowering Learners	3.25	Agree	2
Facilitating Learners' Digital Competence	3.29	Agree	1
Composite Mean	3.22	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Among the three indicators, *"Facilitating Learners' Digital Competence"* ranked first with a weighted mean of 3.29 (*Agree*). This suggests that respondents place high importance on developing students' digital literacy skills, including responsible use of technology, critical evaluation of information, and ethical online behavior. This is supported by literature emphasizing that teachers are key agents in fostering digital citizenship and preparing students for participation in a digital society (World Economic Forum, 2024). The second-highest indicator, *"Empowering Learners"*, obtained a weighted mean of 3.25 (*Agree*). This indicates that respondents effectively use digital tools to promote learner autonomy, flexibility, and inclusivity. Research supports that empowering learners through technology enhances student engagement, encourages self-directed learning, and supports diverse learning needs (Zou et al., 2025). Meanwhile, *"Professional Engagement"* ranked third with a weighted mean of 3.12 (*Agree*). Although still positively rated, this suggests that teachers' engagement in professional communication and development through digital platforms may be slightly less emphasized compared to learner-focused competencies. This aligns with studies indicating that while teachers recognize the importance of digital tools in professional growth, participation in ongoing digital professional development may depend on access, institutional support, and personal motivation (Xue et al., 2025).

The overall results indicate that teachers demonstrate a balanced level of digital competency across the three dimensions, with stronger emphasis on student-centered competencies such as facilitating digital skills and empowering learners. However, there is still a need to strengthen professional engagement through increased participation in digital collaboration and continuous professional development activities. In general, these findings suggest that enhancing teacher digital competency—particularly through targeted training programs and institutional support—can further improve the effective integration of mobile applications and artificial intelligence in instruction, thereby contributing to higher instructional efficacy (Zou et al., 2025; World Economic Forum, 2024).

Table 4

Summary Table on Instructional Efficacy

Indicators	Weighted Mean	Verbal Interpretation	Rank
Instructional Planning Effectiveness	3.26	Agree	1
Classroom Engagement Effectiveness	3.16	Agree	3
Learning Outcome Achievement	3.25	Agree	2
Composite Mean	3.22	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 4 presents the summary of respondents' assessment of instructional efficacy across three dimensions: instructional planning effectiveness, classroom engagement effectiveness, and learning outcome achievement. The composite mean of 3.22, interpreted as *Agree*, indicates that respondents generally perceive themselves as effective in delivering instruction that supports student learning and achievement. This finding is consistent with recent studies which emphasize that instructional efficacy is enhanced when teachers effectively plan, engage students, and achieve desired learning outcomes, particularly when supported by technology integration (Zou et al., 2025; Li et al., 2024).

"Instructional Planning Effectiveness" ranked first with a weighted mean of 3.26 (*Agree*). This suggests that respondents demonstrate strength in preparing structured and well-organized lesson plans that align with learning objectives and utilize appropriate instructional resources. This aligns with research indicating that effective

instructional planning is fundamental to successful teaching, as it provides a clear framework for delivering content and facilitating meaningful learning experiences (World Economic Forum, 2024). The second-highest indicator, *"Learning Outcome Achievement"*, obtained a weighted mean of 3.25 (*Agree*). This indicates that respondents perceive their instructional practices as contributing to students' ability to achieve intended learning outcomes, demonstrate mastery, and apply knowledge effectively. Studies support that instructional effectiveness is strongly reflected in student achievement and performance, which are influenced by the quality of teaching strategies and the alignment between objectives, instruction, and assessment (Zou et al., 2025). Meanwhile, *"Classroom Engagement Effectiveness"* ranked third with a weighted mean of 3.16 (*Agree*). Although still positively rated, this suggests that engaging students actively in learning activities may be slightly less emphasized compared to planning and outcome achievement. Research indicates that sustaining student engagement requires the consistent use of interactive strategies, collaborative activities, and technology-enhanced learning approaches (Li et al., 2024). The relatively lower rating may also imply the need for further strengthening of strategies that promote interaction and collaboration among learners.

Table 5

Relationship Between Mobile Applications in Instruction and Teacher Digital Competency

Instructional Support	rho-value	p-value	Interpretation
Professional Engagement	.516**	0.000	Highly Significant
Empowering Learners	.826**	0.000	Highly Significant
Facilitating Learners' Digital Competence	.673**	0.000	Highly Significant
Collaboration and Communication			
Professional Engagement	.485**	0.000	Highly Significant
Empowering Learners	.610**	0.000	Highly Significant
Facilitating Learners' Digital Competence	.922**	0.000	Highly Significant
Learner Engagement and Motivation			
Professional Engagement	.820**	0.000	Highly Significant
Empowering Learners	.807**	0.000	Highly Significant
Facilitating Learners' Digital Competence	.629**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

Table 5 presents the relationship between mobile applications in instruction and teacher digital competency using Spearman's rho correlation analysis. It examines how the dimensions of mobile application use—Instructional Support, Collaboration and Communication, and Learner Engagement and Motivation—are associated with key areas of teacher digital competency, namely Professional Engagement, Empowering Learners, and Facilitating Learners' Digital Competence. Results reveal that all correlations are positive and statistically significant at the 0.01 level. This indicates that greater utilization of mobile applications in instruction is significantly associated with higher levels of teacher digital competency. This finding is consistent with recent studies emphasizing that the effective use of mobile technologies enhances teachers' digital skills, professional practices, and ability to integrate technology into pedagogy (Zou et al., 2025; Xue et al., 2025).

For Instructional Support, all relationships with teacher digital competency were positive and highly significant. The strongest relationship was observed with Empowering Learners, indicating a very strong positive association. This suggests that teachers who effectively use mobile applications for instructional support are more capable of implementing learner-centered approaches that promote autonomy, active participation, and personalized learning. This aligns with research indicating that mobile technologies enable teachers to design adaptive learning environments that enhance student independence and engagement (World Economic Forum, 2024; Zou et al., 2025). This was followed by Facilitating Learners' Digital Competence, reflecting a strong relationship between instructional support and students' digital literacy development. Meanwhile, Professional Engagement showed a moderate positive correlation, suggesting that instructional use of mobile applications also contributes to teachers' collaboration, communication, and professional growth through digital platforms (Xue et al., 2025).

In terms of Collaboration and Communication, all dimensions of teacher digital competency were likewise significantly related. The strongest relationship was found with Facilitating Learners' Digital Competence, which represents the highest correlation in the table. This very strong association indicates that teachers who utilize mobile applications for communication and collaboration are highly effective in developing students' digital literacy, including responsible use of technology, critical thinking, and digital problem-solving skills. This finding is supported by recent literature emphasizing that collaborative digital environments play a critical role in developing learners' digital competencies through interactive and participatory learning experiences (Zou et al., 2025; Xue et al., 2025). Strong positive relationships were also found with Empowering Learners and Professional Engagement, demonstrating that communication-centered mobile tools support both student empowerment and professional interaction among educators.

Similarly, Learner Engagement and Motivation exhibited strong and highly significant relationships with all dimensions of teacher digital competency. The strongest correlation was observed with Professional Engagement, followed closely by Empowering Learners. These findings imply that teachers who utilize mobile applications to enhance student engagement and motivation are also more likely to demonstrate strong professional digital practices, including continuous learning, collaboration, and effective use of technology in teaching. This is consistent with research suggesting that engaging digital learning environments encourage teachers to adopt innovative practices and continuously enhance their digital competencies (World Economic Forum, 2024; Zou et al., 2025). Additionally, Facilitating Learners' Digital Competence showed a substantial positive relationship, indicating that engaging students through mobile applications contributes to the development of essential digital skills.

Overall, the results indicate a strong and interdependent relationship between mobile application use and teacher digital competency. Mobile applications not only support instructional delivery but also enhance teachers' ability to engage learners, foster digital skills, and improve professional practices. These findings highlight the importance of strengthening teachers' capacity to integrate mobile technologies, as this directly contributes to the development of comprehensive digital competencies necessary for effective instruction in the 21st century (Zou et al., 2025; Xue et al., 2025; World Economic Forum, 2024).

Table 6

Relationship Between Artificial Intelligence in Instruction and Teacher Digital Competency

Personalized Learning	rho-value	p-value	Interpretation
Professional Engagement	.823**	0.000	Highly Significant
Empowering Learners	.805**	0.000	Highly Significant
Facilitating Learners' Digital Competence	.548**	0.000	Highly Significant
Automated Assessment			
Professional Engagement	.732**	0.000	Highly Significant
Empowering Learners	.929**	0.000	Highly Significant
Facilitating Learners' Digital Competence	.667**	0.000	Highly Significant
Data Analytics and Administrative Support			
Professional Engagement	.693**	0.000	Highly Significant
Empowering Learners	.589**	0.000	Highly Significant
Facilitating Learners' Digital Competence	.634**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

Table 6 presents the relationship between artificial intelligence (AI) in instruction and teacher digital competency using Spearman's rho correlation analysis. Specifically, the table examines how the dimensions of AI in instruction—Personalized Learning, Automated Assessment, and Data Analytics and Administrative Support—are associated with the dimensions of teacher digital competency, namely Professional Engagement, Empowering Learners, and Facilitating Learners' Digital Competence. The results reveal that all correlations are positive and statistically significant at the 0.01 level, with all p-values equal to 0.000. This indicates that greater integration of AI in instructional practices is associated with higher levels of teacher digital competency. This finding aligns with recent studies emphasizing that the adoption of AI technologies in education enhances teachers' digital skills, pedagogical capabilities, and professional practices (Zou et al., 2025; Xue et al., 2025).

For Personalized Learning, all relationships with teacher digital competency were highly significant and positive. The strongest relationship was observed with Professional Engagement, followed closely by Empowering Learners. These very strong correlations suggest that teachers who effectively utilize AI to personalize learning experiences are more engaged in professional digital practices and are more capable of implementing learner-centered approaches that address individual student needs. This is supported by recent literature indicating that AI-driven personalized learning environments require teachers to continuously engage in professional development and adapt their instructional strategies to meet diverse learner profiles (World Economic Forum, 2024; Zou et al., 2025). Facilitating Learners' Digital Competence demonstrated a moderate to strong positive relationship, indicating that AI-supported personalization also contributes to the development of students' digital literacy, including critical thinking and responsible use of technology (Xue et al., 2025).

In terms of Automated Assessment, the findings revealed the strongest relationships among all dimensions in the table. The highest correlation was found between Automated Assessment and Empowering Learners, indicating a very strong positive association. This suggests that teachers who utilize AI-powered assessment tools are more capable of providing timely feedback, monitoring student progress, and supporting individualized learning pathways that empower learners. This is consistent with research showing that AI-based assessment systems enhance formative assessment practices and enable teachers to personalize feedback, thereby improving student autonomy and engagement (Cengage Group, 2024; Zou et al., 2025). Strong positive relationships were also observed with Professional Engagement and Facilitating Learners' Digital Competence. Results indicate that AI-driven assessment practices not only improve instructional efficiency but also strengthen teachers' professional use of technology and their ability to guide students in developing digital skills (Xue et al., 2025).

For Data Analytics and Administrative Support, all dimensions of teacher digital competency were likewise positively and significantly related. Strongest correlation was observed with Professional Engagement, suggesting that teachers who use AI for data analysis and administrative tasks tend to be more engaged in professional digital practices and evidence-based decision-making. This aligns with studies highlighting that AI analytics enable teachers to interpret student data more effectively, leading to improved instructional planning and professional growth (World Economic Forum, 2024). This was followed by Facilitating Learners' Digital Competence and Empowering Learners, both indicating moderate to strong positive relationships. These findings imply that the use of AI-generated insights supports teachers in designing responsive instruction, addressing learner needs, and fostering digital competencies among students (Zou et al., 2025; Xue et al., 2025).

Overall, the results indicate a strong and consistent relationship between AI integration and teacher digital competency across all dimensions. The findings suggest that as teachers increasingly adopt AI technologies in instructional practices, their ability to engage professionally, empower learners, and facilitate digital competence also improves. This underscores the importance of equipping teachers with adequate training, resources, and institutional support to effectively integrate AI in education. Strengthening AI competencies among educators is essential for maximizing the benefits of emerging technologies and achieving higher levels of instructional effectiveness in the digital age (World Economic Forum, 2024; Zou et al., 2025).

Table 7 presents the results of the multiple regression analysis conducted to determine the significant predictors of instructional efficacy. The model included dimensions of mobile applications in instruction, artificial intelligence (AI) in instruction, and teacher digital competency as independent variables. The regression model was found to be highly significant, $F(9, 375) = 509.996$, $p < 0.05$, with an R^2 of 0.924, indicating that 92.4% of the variance in instructional efficacy is explained by the combined influence of the predictor variables. This exceptionally high coefficient of determination suggests a strong explanatory power of the model. This finding is consistent with recent research emphasizing that the integration of digital technologies, AI, and teacher competencies collectively contributes to improved instructional effectiveness and learning outcomes (Zou et al., 2025; World Economic Forum, 2024).

Table 7

Predictors of Instructional Efficacy

	Unstandardized Coefficients		t-value	p-value	Interpretation
	B	Std. Error			
(Constant)	0.434	0.054	8.002	0.000	
Instructional Support	0.112	0.034	3.318	0.001	Highly Significant
Collaboration and Communication	0.468	0.058	8.095	0.000	Highly Significant
Learner Engagement and Motivation	0.199	0.032	6.186	0.000	Highly Significant
Personalized Learning	0.112	0.040	2.813	0.005	Significant
Automated Assessment	-0.040	0.050	-0.799	0.425	Not Significant
Data Analytics and Administrative Support	0.550	0.019	28.755	0.000	Highly Significant
Professional Engagement	-0.002	0.026	-0.069	0.945	Not Significant
Empowering Learners	-0.114	0.047	-2.435	0.015	Significant
Facilitating Learners' Digital Competence	-0.415	0.056	-7.438	0.000	Highly Significant

Legend: Significant at p-value < 0.05; $F_{(9.375)}$=509.996; r^2=0.924

Among the predictors, Data Analytics and Administrative Support emerged as the strongest predictor of instructional efficacy. This indicates that the use of AI-driven analytics and administrative tools significantly enhances teaching effectiveness. This result aligns with recent studies showing that AI-powered data analytics enable teachers to make informed instructional decisions, monitor student progress, and optimize teaching strategies, thereby improving overall instructional performance (Cengage Group, 2024; Zou et al., 2025). The strong predictive value highlights the importance of data-driven teaching in modern educational settings. This was followed by Collaboration and Communication, which also showed a highly significant positive effect. This suggests that the use of mobile applications and digital tools to facilitate communication and collaboration significantly contributes to instructional efficacy. This finding is supported by literature indicating that collaborative and communication-rich learning environments enhance student participation, knowledge sharing, and teacher effectiveness (Zou et al., 2025; Li et al., 2024).

Learner Engagement and Motivation was found to be a significant positive predictor. This implies that engaging students through technology-enhanced learning environments leads to improved instructional outcomes. Research confirms that student engagement is key determinant of academic success and is positively influenced by interactive and technology-supported instructional strategies (World Economic Forum, 2024). Additionally, Instructional Support and Personalized Learning were also significant positive predictors. These findings suggest that the use of mobile applications to support instruction and AI to personalize learning experiences contributes to improved instructional effectiveness. This aligns with recent studies highlighting that personalized learning systems and well-structured digital instructional support enhance learning efficiency and student achievement (Zou et al., 2025; Xue et al., 2025).

On the other hand, Automated Assessment and Professional Engagement were found to be not significant predictors of instructional efficacy. These results suggest that, when considered alongside other variables, automated grading tools and professional digital activities do not independently contribute to variations in instructional effectiveness. This may be explained by the overlapping influence of stronger predictors such as data analytics, engagement, and collaboration, which already capture much of the impact of technology use in teaching (Zou et al., 2025).

Interestingly, two dimensions of teacher digital competency exhibited significant negative coefficients. Empowering Learners showed a significant negative effect, while Facilitating Learners' Digital Competence demonstrated a highly significant negative effect. These results do not necessarily indicate that these competencies negatively impact instructional efficacy. Rather, they may reflect multicollinearity or shared variance among predictor variables, where highly correlated constructs overlap in explaining instructional outcomes. This is a common occurrence in regression analysis, where the direction of coefficients reflects each variable's unique contribution after controlling for others (Xue et al., 2025).

Recent literature also supports that while teacher digital competency is essential, its effects on instructional efficacy are often indirect and mediated through technology integration, engagement strategies, and AI-supported practices (World Economic Forum, 2024; Zou et al., 2025). Findings indicate that AI-driven data analytics, collaboration and communication, and learner engagement are the strongest drivers of instructional efficacy, while the role of teacher digital competency is more complex and interdependent with other variables. Results highlight the importance of integrating mobile technologies and AI with effective pedagogical practices to achieve optimal instructional outcomes in the digital age.

Table 8

Proposed Action Plan for Enhancing Instructional Efficacy through Mobile Applications, Artificial Intelligence, and Teacher Digital Competency

KRA (Key Result Area)	Strategies	Objective of the Strategies	Persons Involved	Expected Outcomes
Facilitating Learners' Digital Competence	Conduct structured ICT integration workshops focused on embedding digital literacy tasks in lesson plans. Develop classroom-based digital projects where students use mobile apps and AI tools. Implement peer mentoring among teachers on digital facilitation strategies.	To strengthen teachers' ability to guide students in developing digital skills using mobile and AI tools.	School administrators, ICT coordinators, teachers, students	Improved student digital competence and more effective teacher facilitation of technology-enhanced learning.
Collaboration and Communication (Mobile Applications	Introduce institutional use of collaborative mobile platforms (e.g., LMS, messaging apps, shared digital boards). Train teachers on effective online communication and interactive instruction using mobile tools. Establish digital collaboration protocols for students and teachers.	To enhance real-time communication, teamwork, and instructional collaboration using mobile applications.	School leaders, IT department, faculty members, students	Increased interaction, improved communication flow, and stronger collaborative learning environment.
Instructional Support (Mobile Applications	Expand access to mobile learning resources and instructional apps. Train teachers in designing mobile-assisted instructional materials. Provide institutional support for app-based lesson delivery.	To improve the quality and consistency of instructional support using mobile applications.	School administrators, ICT units, teachers	Enhanced instructional delivery and improved student learning support.

4. Conclusions and recommendations

The respondents generally agree that mobile applications are effective in instruction. The respondents generally agree on the use of artificial intelligence in instruction. The respondents generally agree on teachers' digital competency. Respondents generally agreed on the level of instructional efficacy. There is a positive and highly significant relationship between mobile applications and artificial intelligence in instruction, as all correlations are significant. Data Analytics and Administrative Support emerged as the strongest positive predictor in the instructional efficacy. Action plan for enhancing instructional efficacy through the effective use of mobile applications, artificial intelligence, and teacher digital competency is proposed.

The educational institutions may prioritize continuous professional development programs focusing on facilitating learners' digital competence emphasizing on practical integration of digital tools in lesson delivery to better support student digital literacy. The educational institutions may invest in learning analytics systems to help teachers make informed instructional decisions and improve student performance tracking. Educational institutions may develop clear policies and frameworks that support the integration of mobile applications and AI in instruction to ensure consistency, sustainability, and quality implementation. Future researchers are encouraged to replicate this study in different geographical locations, educational levels, or institutional settings to validate and compare findings. The proposed action plan may be presented to the educational institutions for review and implementation.

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