

DIGITAL BUSINESS COMPETENCIES AND HUMAN CAPABILITIES IN THE HOSPITALITY INDUSTRY: DRIVING EMPLOYEE ADAPTABILITY AND SERVICE EXCELLENCE

Widya Granita^{1*}, Zairil²

¹Bina Nusantara University, Indonesia

²Institut Pariwisata Tedja Indonesia

*Corresponding Author:

widya.granita@binus.ac.id

Abstract

The rapid digital transformation in the hospitality industry has significantly reshaped service delivery processes, operational systems, and employee competency requirements. This study aims to examine the influence of Digital Business Competencies on Service Excellence, with Employee Adaptability acting as a mediating variable within the hospitality industry. Grounded in Dynamic Capability Theory, this study investigates how employees' digital competencies contribute to organizational service performance in increasingly technology-driven hospitality environments. A quantitative research approach was employed using a cross-sectional survey design. Data were collected from 286 hospitality employees working in hotels, resorts, restaurants, and tourism-related service organizations that have implemented digital technologies in their operational activities. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS software. The findings reveal that Digital Business Competencies significantly influence Employee Adaptability and Service Excellence. Furthermore, Employee Adaptability demonstrates a significant positive effect on Service Excellence and partially mediates the relationship between Digital Business Competencies and Service Excellence. The study highlights that digital transformation in hospitality should not focus solely on technological investment but must also emphasize human capability development and workforce adaptability. The findings contribute to the growing literature on human-centered digital transformation by integrating technological capability and employee adaptability into a unified hospitality service framework. Practically, the study provides important managerial implications for hospitality organizations in designing digital competency development programs, adaptive workforce strategies, and sustainable service excellence initiatives in digitally evolving hospitality environments.

Keywords: Digital Business Competencies, Employee Adaptability, Service Excellence, Hospitality Industry, Digital Transformation.

1. Introduction

The hospitality industry is undergoing a profound transformation driven by rapid advancements in digital technology, changing consumer expectations, and increasing competitive pressures. The emergence of digital business models, artificial intelligence (AI), cloud computing, automation, big data analytics, and smart service technologies has fundamentally altered how hospitality organizations operate and deliver value to customers. In this evolving environment, hospitality firms are no longer competing solely through physical facilities or traditional service quality, but increasingly through their ability to leverage digital technologies and human capabilities to create innovative, responsive, and customer-centered services (Busulwa et al., 2022).

Recent industry reports show strong acceleration of digital transformation in hospitality. The global hospitality digital transformation market size was estimated around USD 35–40 billion in 2023 and is projected to continue growing rapidly through 2030 due to AI, automation, cloud systems, and smart guest technologies. The digitalization of hospitality operations has accelerated significantly in the post-pandemic era, forcing organizations to rethink business processes, employee roles, and organizational capabilities. Hotels, restaurants, and tourism-related businesses are increasingly implementing digital systems such as mobile check-in applications, contactless payment systems, AI-powered chatbots, customer relationship management (CRM) platforms, and smart room technologies to improve efficiency and customer experience (García-López et al., 2025). While these technologies offer substantial operational benefits, their successful implementation depends heavily on employees' digital competencies and adaptability. Technology alone cannot guarantee superior service performance if employees lack the necessary skills and capabilities to effectively integrate digital tools into service delivery processes.

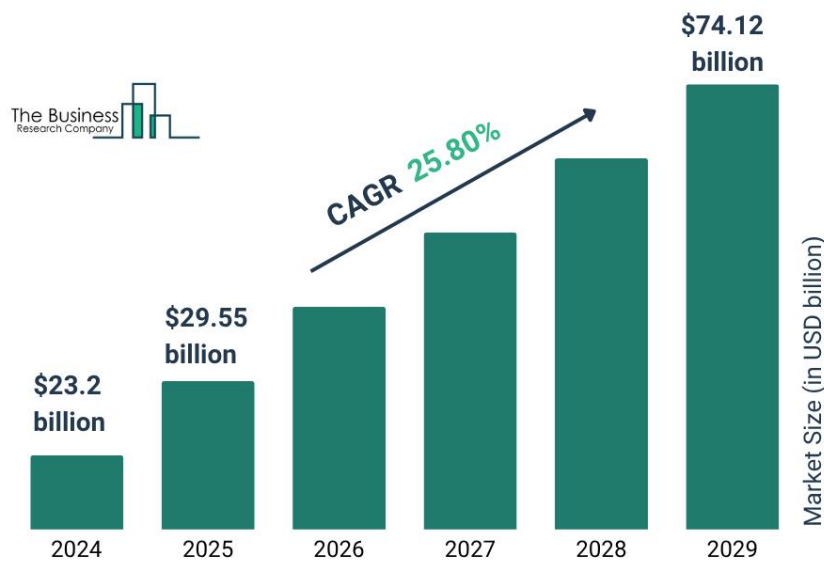


Figure 1. Smart Hospitality Global Market Report (2025)

In service-intensive industries such as hospitality, human resources remain central to organizational success despite the increasing prevalence of automation and digital technologies. Hospitality services are characterized by high levels of human interaction, emotional labor, and personalized customer engagement, making employee capabilities a critical determinant of service quality and customer satisfaction. However, the digital transformation of hospitality has expanded the competency requirements expected from employees. In addition to traditional interpersonal and operational skills, employees are now expected to possess digital business competencies, technological adaptability, data literacy, and innovation-oriented mindsets (Busulwa et al., 2022). Recent studies have emphasized that digital competencies are becoming an essential component of hospitality workforce development. Digital competencies refer to employees' ability to effectively use digital technologies, manage digital information, communicate through digital platforms, and adapt to technology-driven work environments. In hospitality settings, these competencies include the ability to operate digital reservation systems, manage online customer interactions, utilize data-driven decision-making tools, and engage with AI-supported service systems (Yadnya & Khamiliyah, 2024). Employees with strong

digital competencies are more capable of responding to technological changes, enhancing operational flexibility, and contributing to service innovation.

The growing importance of digital business competencies is closely related to the concept of dynamic capabilities. Dynamic capability theory suggests that organizations must continuously develop, integrate, and reconfigure internal competencies to respond effectively to rapidly changing environments. In the tourism and hospitality industry, digital transformation requires firms to develop not only technological infrastructure but also organizational learning, adaptive capabilities, and human capital readiness (Nguyen et al., 2022). Human capabilities such as adaptability, learning orientation, creativity, and digital agility are increasingly viewed as strategic resources that enable organizations to sustain competitive advantage in digitally disrupted markets.

Employee adaptability has therefore emerged as one of the most important competencies in the modern hospitality industry. Adaptability refers to employees' ability to adjust their behaviors, skills, and attitudes in response to changing work demands, technologies, and customer expectations. Digital transformation has significantly altered hospitality job structures, requiring employees to continuously learn new systems, manage hybrid service interactions, and operate within increasingly technology-mediated environments. Employees who demonstrate higher adaptability are more capable of embracing innovation, handling uncertainty, and maintaining service quality during organizational change processes (Longo et al., 2022). The importance of adaptability is particularly evident in the context of smart hospitality environments. Smart hospitality refers to the integration of intelligent technologies into hospitality operations to create seamless, personalized, and data-driven service experiences. Smart hotels increasingly rely on digital interfaces, AI systems, IoT devices, and automated service technologies to improve guest experiences and operational efficiency. However, despite the growing adoption of smart technologies, hospitality organizations still depend heavily on employees to facilitate customer interaction, resolve service problems, and create emotional connections with guests. Consequently, employees must possess both technological competence and interpersonal capability to deliver high-quality service in digitally integrated environments.

Service excellence remains a fundamental objective in the hospitality industry, even amid increasing digitalization. Service excellence refers to the consistent delivery of superior service experiences that exceed customer expectations and create long-term customer satisfaction and loyalty. While technology can improve efficiency and convenience, the human aspect of service delivery remains essential in shaping customer perceptions and emotional experiences. Recent literature suggests that service excellence in the digital era requires a balance between technological efficiency and human-centered service interactions (Dang & Nguyen, 2023). Customers increasingly expect seamless digital experiences combined with personalized human engagement, making employee competencies a critical factor in achieving service excellence. Furthermore, digital transformation has shifted organizational focus toward customer value co-creation. In digitally connected hospitality ecosystems, customers actively participate in service processes through online platforms, digital reviews, social media engagement, and self-service technologies. This shift requires employees to become facilitators of customer engagement rather than merely service providers. Employees must therefore develop competencies related to communication, digital collaboration, problem-solving, and customer experience management to support value co-creation processes effectively (Dang & Nguyen, 2023).

Despite the growing body of literature on digital transformation in hospitality, several research gaps remain. First, many studies focus primarily on organizational or technological perspectives, while limited attention has been given to the integration of digital business competencies and human capabilities at the employee level. Second, existing studies often examine digital competencies, adaptability, or service excellence separately, rather than exploring the interconnected relationships among these constructs. Third, empirical research investigating how digital business competencies influence employee adaptability and subsequently drive service excellence remains limited, particularly in hospitality contexts. Furthermore, previous studies have predominantly emphasized technological adoption outcomes such as operational efficiency, customer satisfaction, or innovation performance, while overlooking the human-centered dimensions of digital transformation. In reality, successful digital transformation in hospitality requires employees who are not only technologically competent but also adaptable, emotionally intelligent, and capable of maintaining high-quality interpersonal interactions in technology-mediated environments. Therefore, understanding the role of human capabilities in digital hospitality has become increasingly important both theoretically and practically.

The urgency of this research is underscored by the accelerating pace of digital transformation in the hospitality industry and the critical role that employees play in ensuring successful technology adoption and service excellence. Without a comprehensive understanding of how digital business competencies influence employee adaptability and service excellence, hospitality organizations may invest heavily in technology while neglecting the human capabilities essential for realizing the full benefits of digital transformation. The hospitality industry's unique characteristics—high human interaction, emotional labor, and personalized service delivery—make the integration of digital competencies and human capabilities particularly important for sustainable competitive advantage.

Therefore, this study aims to examine the relationship between digital business competencies and human capabilities in the hospitality industry, particularly focusing on how digital competencies influence employee adaptability and service excellence. By adopting a literature review approach, this study synthesizes recent findings from hospitality, digital business, and human resource literature to develop a comprehensive understanding of workforce transformation in digitally evolving hospitality environments. The study also seeks to provide practical implications for hospitality organizations in developing human-centered digital transformation strategies that strengthen employee performance and long-term organizational competitiveness. The findings of this research are expected to provide both theoretical and practical contributions. Theoretically, the study contributes to the literature on digital transformation, dynamic capabilities, and human resource management by emphasizing the interaction between technological and human factors in hospitality contexts. Practically, the results offer actionable insights for hospitality managers in designing training programs, workforce development strategies, and digital transformation initiatives that enhance employee adaptability and service excellence. By achieving these objectives, the study aims to support the sustainable growth of hospitality organizations through improved understanding of the critical role of human capabilities in digitally evolving environments. The article is organized as follows. The next section discusses the theoretical background, followed by the research methods. The results and discussion are then presented, and the final section concludes the study.

2. Theoretical Background

2.1 Dynamic Capability Theory

Dynamic capability theory provides the foundational framework for understanding how organizations develop, integrate, and reconfigure internal competencies to respond effectively to rapidly changing environments (Teece et al., 1997). In the context of hospitality digital transformation, dynamic capabilities involve the ability to sense technological opportunities, seize innovation potential, and transform operational processes accordingly (Rizana et al., 2025; Samsuden et al., 2024). Recent literature reviews demonstrate that digital dynamic capabilities significantly enhance service innovation, customer responsiveness, and competitive advantage in service industries (Rizana et al., 2025; Samsuden et al., 2024). The theory emphasizes that organizations must continuously develop not only technological infrastructure but also organizational learning, adaptive capabilities, and human capital readiness to sustain competitive advantage in digitally disrupted markets (Nguyen et al., 2022). In hospitality settings, dynamic capabilities involve the integration of digital business competencies, employee adaptability, and organizational learning mechanisms to support service excellence and operational resilience (Busulwa et al., 2022). Digital maturity research indicates that organizations with stronger adaptive cultures and employee learning orientation tend to achieve more successful digital transformation outcomes. Consequently, employee adaptability is increasingly recognized as a strategic capability that enables hospitality firms to sustain operational resilience and service excellence amid technological disruption (Guerrero et al., 2022).

2.2 Digital Business Competencies

Digital transformation has become a dominant strategic agenda across industries, particularly in hospitality, where technological innovation increasingly shapes operational efficiency, customer engagement, and service delivery processes. Recent studies emphasize that digital transformation is no longer limited to technology adoption, but rather involves the integration of organizational capabilities, human competencies, and adaptive business processes to achieve sustainable competitive advantage (Rizana et al., 2025; Samsuden et al., 2024). The growing dependence on digital systems such as artificial intelligence (AI), customer relationship management (CRM), cloud computing, and smart service technologies has transformed the competency requirements of hospitality employees. As a result, organizations are increasingly focusing on developing digital business competencies and human capabilities to remain competitive in technology-driven environments.

Research on digital capabilities highlights that organizations with stronger digital competencies tend to demonstrate better business performance, operational agility, and innovation capability. Samsuden et al. (2024) identified digital technology capability, digital agility, and digital marketing capability as key dimensions influencing organizational performance in digitally transformed businesses. Similarly, Rizana et al. (2025) argued that successful digital transformation depends not only on technological infrastructure but also on leadership capability, employee digital capability, and organizational readiness. In hospitality settings, digital capability includes employees' ability to operate digital reservation systems, manage online customer interactions, and utilize AI-supported service tools effectively. These competencies allow organizations to respond more rapidly to changing customer expectations and market conditions. Furthermore, Gutierrez et al. (2023) noted that digital transformation in tourism and

hospitality has shifted organizational focus toward customer-centric and data-driven service innovation. Meanwhile, recent bibliometric findings by hospitality scholars indicate that digital transformation research increasingly emphasizes stakeholder outcomes, online engagement, and smart technology implementation as critical themes shaping hospitality competitiveness (Li et al., 2024).

The literature consistently demonstrates that digital capabilities have evolved into strategic organizational assets within hospitality businesses. Existing studies agree that digital transformation requires a combination of technological readiness, employee digital literacy, and organizational adaptability. However, while prior research largely focuses on organizational-level digital transformation outcomes, fewer studies specifically examine how employee-level digital competencies contribute to adaptability and service excellence in hospitality environments. This suggests the need for more human-centered investigations into digital transformation processes.

2.3 Employee Adaptability

Employee adaptability has become one of the most discussed human capabilities in digital business environments. Adaptability refers to employees' capacity to adjust their skills, behaviors, and attitudes in response to technological and organizational changes. In hospitality contexts, adaptability is particularly important because service environments are highly dynamic and customer expectations continue to evolve rapidly. Recent studies emphasize that adaptable employees are more capable of managing uncertainty, learning new systems, and maintaining service quality during digital transformation processes (Gonzalez-Varona et al., 2024). Organizational learning and knowledge-sharing mechanisms also play an essential role in enhancing adaptability and digital maturity within organizations. Furthermore, digital business ecosystem studies suggest that hospitality firms require structured capability development frameworks to support employee adaptation to digital transformation initiatives (Guerrero et al., 2022). Employees who possess higher levels of adaptability are more likely to embrace innovation, collaborate effectively with AI technologies, and contribute positively to organizational agility.

The increasing implementation of AI and automation technologies in hospitality has also reshaped employee roles and service interactions. AI-based technologies such as chatbots, recommendation systems, robotic services, and automated customer support systems are becoming increasingly common in hotel operations. According to recent systematic reviews, AI adoption in hospitality influences employee performance, job design, and customer interaction patterns (Bharwani et al., 2025). AI technologies can improve efficiency and reduce repetitive tasks, enabling employees to focus more on personalized customer experiences and relationship-building activities. However, the effectiveness of AI integration depends heavily on employees' ability to collaborate with technology and adapt to digitally mediated service environments. Wang et al. (2025) further argued that employee adaptability, training, and technological confidence are critical determinants of successful AI implementation in hotel operations. Moreover, Busulwa et al. (2022) emphasized that hospitality managers increasingly require digital business competencies, including digital customer engagement, digital innovation management, and digital leadership capability. These competencies are essential for managing digitally transformed hospitality organizations and ensuring service consistency across online and offline interactions.

The reviewed studies collectively highlight adaptability as a crucial human capability in digitally evolving hospitality environments. Employee adaptability not only supports technology adoption but also strengthens organizational agility, innovation capability, and service resilience. Existing literature strongly supports the idea that adaptable employees contribute significantly to successful digital transformation. However, empirical investigations examining the direct relationship between digital business competencies, employee adaptability, and service excellence in hospitality contexts remain limited.

2.4 Service Excellence

Service excellence remains a fundamental objective in the hospitality industry, even amid increasing digitalization. Service excellence refers to the consistent delivery of superior service experiences that exceed customer expectations and create long-term customer satisfaction and loyalty. While technology can improve efficiency and convenience, the human aspect of service delivery remains essential in shaping customer perceptions and emotional experiences. Recent literature suggests that service excellence in the digital era requires a balance between technological efficiency and human-centered service interactions (Dang & Nguyen, 2023). Customers increasingly expect seamless digital experiences combined with personalized human engagement, making employee competencies a critical factor in achieving service excellence.

Recent hospitality literature indicates that AI and digital technologies are fundamentally changing workforce structures and service processes. Employees are no longer expected to perform only traditional service tasks but must also interact effectively with digital systems and AI-based technologies. The literature also suggests that technological implementation alone is insufficient without employee adaptability and digital confidence. Therefore, human capabilities emerge as a critical factor that determines whether digital transformation initiatives enhance or hinder service performance in hospitality organizations.

Service excellence remains a core objective of hospitality organizations despite the increasing reliance on technology and automation. Hospitality businesses operate within experience-based markets where customer perceptions are shaped not only by efficiency but also by emotional interaction and personalized service. Recent studies argue that digital transformation should complement rather than replace human-centered service delivery (Wang et al., 2025). Customers increasingly expect seamless integration between digital convenience and authentic interpersonal engagement. Consequently, hospitality employees must balance technological proficiency with emotional intelligence, communication skills, and customer-oriented behavior.

Several recent studies have emphasized the relationship between employee digital competence and service performance. Hospitality employees who possess stronger digital skills tend to demonstrate better problem-solving capability, operational efficiency, and responsiveness to customer needs. In addition, organizations that invest in digital capability development often experience improvements in employee engagement, innovation behavior, and service quality outcomes (Busulwa et al., 2022). The integration of AI and smart technologies can also enhance customer experience when employees effectively facilitate technology-supported interactions. However, some studies caution that excessive automation without adequate human capability development may negatively affect customer satisfaction and emotional connection. Therefore, hospitality

organizations must ensure that digital transformation initiatives remain human-centered and capability-driven.

The literature demonstrates that service excellence in the digital era depends on the integration of technological capability and human capability. Digital technologies can improve operational efficiency and service consistency, but employees remain central in delivering emotionally engaging and personalized experiences. Current research increasingly supports the importance of human-centered digital transformation, yet limited studies provide integrated frameworks explaining how digital business competencies influence employee adaptability and ultimately contribute to service excellence in hospitality industries.

2.5 Hypothesis Development

2.5.1 Digital Business Competencies and Employee Adaptability

Digital business competencies refer to employees' ability to effectively use digital technologies, manage digital information, communicate through digital platforms, and adapt to technology-driven work environments (Yadnya & Khamiliyah, 2024). Employees with strong digital competencies are more capable of responding to technological changes, enhancing operational flexibility, and contributing to service innovation. The literature consistently demonstrates that digital capabilities have evolved into strategic organizational assets within hospitality businesses. Existing studies agree that digital transformation requires a combination of technological readiness, employee digital literacy, and organizational adaptability (Busulwa et al., 2022). Employees who demonstrate higher digital competencies are more likely to embrace innovation, handle uncertainty, and maintain service quality during organizational change processes (Longo et al., 2022). Furthermore, digital business ecosystem studies suggest that hospitality firms require structured capability development frameworks to support employee adaptation to digital transformation initiatives (Guerrero et al., 2022). Therefore, it is hypothesized that: *H₁: Digital business competencies have a positive effect on employee adaptability in hospitality organizations.*

2.5.2 Employee Adaptability and Service Excellence

Service excellence refers to the consistent delivery of superior service experiences that exceed customer expectations and create long-term customer satisfaction and loyalty (Dang & Nguyen, 2023). Employee adaptability has emerged as one of the most important competencies in the modern hospitality industry. Adaptability refers to employees' ability to adjust their behaviors, skills, and attitudes in response to changing work demands, technologies, and customer expectations. Recent studies emphasize that adaptable employees are more capable of managing uncertainty, learning new systems, and maintaining service quality during digital transformation processes (Gonzalez-Varona et al., 2024). Employees who possess higher levels of adaptability are more likely to embrace innovation, collaborate effectively with AI technologies, and contribute positively to organizational agility. Wang et al. (2025) further argued that employee adaptability, training, and technological confidence are critical determinants of successful AI implementation in hotel operations. Therefore, it is hypothesized that: *H₂: Employee adaptability has a positive effect on service excellence in hospitality organizations.*

2.5.3 Digital Business Competencies and Service Excellence

Recent studies have emphasized the relationship between employee digital competence and service performance. Hospitality employees who possess stronger digital skills tend to demonstrate better problem-solving capability, operational efficiency, and responsiveness to customer needs. In addition, organizations that invest in digital capability development often experience improvements in employee engagement, innovation behavior, and service quality outcomes (Busulwa et al., 2022). Customers increasingly expect seamless digital experiences combined with personalized human engagement, making employee digital competencies a critical factor in achieving service excellence (Dang & Nguyen, 2023). The integration of AI and smart technologies can also enhance customer experience when employees effectively facilitate technology-supported interactions. Therefore, it is hypothesized that: *H₃: Digital business competencies have a positive effect on service excellence in hospitality organizations.*

2.5.4 The Mediating Role of Employee Adaptability

The reviewed studies collectively highlight adaptability as a crucial human capability in digitally evolving hospitality environments. Employee adaptability not only supports technology adoption but also strengthens organizational agility, innovation capability, and service resilience. Existing literature strongly supports the idea that adaptable employees contribute significantly to successful digital transformation. Digital business competencies may enhance service excellence indirectly by improving employee adaptability. Employees with strong digital competencies are better equipped to adapt to technological changes and maintain service quality in digitally mediated environments, which in turn contributes to service excellence. Therefore, it is hypothesized that: *H₄: Employee adaptability mediates the relationship between digital business competencies and service excellence in hospitality organizations.*

3. Methods

3.1 Research Design

This study employs a quantitative research approach using a cross-sectional survey design to examine the relationships between digital business competencies, employee adaptability, and service excellence in the hospitality industry. The study adopts a causal-explanatory approach to investigate how digital business competencies influence employee adaptability and subsequently affect service excellence within hospitality organizations. A quantitative approach is considered appropriate because the study aims to empirically test the proposed conceptual framework using statistical analysis. The research framework is developed based on Dynamic Capability Theory and recent digital transformation literature in hospitality management.

3.2 Population and Sample

The target population of this study consists of employees working in the hospitality industry, including hotels, resorts, restaurants, and tourism-related service organizations that have implemented digital technologies in their operational activities. A purposive sampling technique is employed to ensure that respondents possess relevant experience with digital systems and hospitality service operations. Respondents must meet several criteria, including being currently employed in the hospitality industry, having at least one year of working experience, and being directly involved in customer service or operational processes using digital technologies. The minimum sample size is determined

based on the "10-times rule" commonly used in Partial Least Squares Structural Equation Modeling (PLS-SEM), as recommended by Hair et al. (2022), with the study targeting approximately 250–350 valid responses to ensure statistical robustness.

3.3 Data Collection Techniques

Data are collected through a structured online questionnaire distributed using digital survey platforms such as Google Forms and Qualtrics. The questionnaire is disseminated through hospitality professional communities, hotel employee networks, LinkedIn groups, tourism associations, and social media platforms to reach relevant respondents efficiently. All measurement items are assessed using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The questionnaire items are adapted from previous validated studies and modified to fit the hospitality context. The constructs measured in this study include Digital Business Competencies, Employee Adaptability, and Service Excellence.

3.4 Operational Definitions of Research Variables

Table 1. Operational Definitions of Research Variables

Variable	Type	Definition	Measurement	Scale	Source
Digital Business Competencies (X)	Independent	Employees' ability to effectively use digital technologies, manage digital information, communicate through digital platforms, and adapt to technology-driven work environments	Five-point Likert scale (1-5) measuring digital technology capability, digital agility, and digital marketing capability	Likert	Adapted from Busulwa et al. (2022); Samsuden et al. (2024); Rizana et al. (2025)
Employee Adaptability (M)	Mediating	Employees' capacity to adjust their skills, behaviors, and attitudes in response to technological and organizational changes	Five-point Likert scale (1-5) measuring adaptability, learning agility, and digital confidence	Likert	Adapted from Gonzalez-Varona et al. (2024); Longo et al. (2022)
Service Excellence (Y)	Dependent	Consistent delivery of superior service	Five-point Likert scale (1-5) measuring service quality,	Likert	Adapted from Dang & Nguyen

Variable	Type	Definition	Measurement	Scale	Source
		experiences that exceed customer expectations and create long-term customer satisfaction and loyalty	customer satisfaction, and service innovation		(2023); Wang et al. (2025)

Source: Author's construction (2025)

3.5 Data Analysis Techniques

Data analysis is conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software, chosen for its suitability in predictive and exploratory research involving complex relationships. The analysis comprises measurement model and structural model evaluation. The measurement model is assessed through convergent validity (factor loadings ≥ 0.70 , AVE ≥ 0.50), reliability (Cronbach's Alpha and Composite Reliability ≥ 0.70), and discriminant validity (Fornell-Larcker criterion and HTMT < 0.90). The structural model is evaluated using path coefficients, coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). A bootstrapping procedure with 5,000 resamples tests the significance of path coefficients and indirect effects. Mediation analysis examines the mediating role of Employee Adaptability using bootstrapping to test indirect effects and determine partial or full mediation, with significance assessed through bootstrap confidence intervals. Participation is voluntary, with informed consent obtained from all respondents. Identities and personal information are kept confidential, and data are used solely for academic purposes.

4. Results and Discussion

4.1 Respondent Profile

A total of 312 questionnaires were distributed to hospitality employees working in hotels, resorts, restaurants, and tourism-related service organizations. After the data screening process, 286 valid responses were retained for analysis, while 26 responses were excluded due to incomplete answers and response inconsistencies. The final sample size exceeded the minimum requirement recommended for Partial Least Squares Structural Equation Modeling (PLS-SEM), thereby ensuring sufficient statistical power for hypothesis testing.

The demographic profile of respondents indicates that the majority were between 21 and 35 years old (68.5%), followed by respondents aged 36–45 years (22.7%), while the remaining respondents were above 45 years old (8.8%). In terms of gender distribution, 54.2% of respondents were female and 45.8% were male. Regarding educational background, most respondents held a bachelor's degree (61.9%), followed by diploma qualifications (27.3%), and postgraduate degrees (10.8%).

In terms of work experience, 47.6% of respondents had between 3–5 years of hospitality experience, while 31.1% had more than five years of experience. The remaining respondents had less than three years of experience. Furthermore, the majority of respondents reported frequent interaction with digital systems in their daily operational activities, including CRM systems, online reservation platforms, digital payment systems,

and AI-assisted customer service applications. This profile indicates that the respondents possess adequate familiarity with digital hospitality environments and are therefore suitable participants for examining digital business competencies and employee adaptability.

4.2 Measurement Model Assessment

4.2.1 Convergent Validity

Convergent validity was assessed using factor loading values and Average Variance Extracted (AVE). The results demonstrate that all measurement items achieved factor loadings above the recommended threshold of 0.70, indicating that the indicators strongly represent their respective constructs. In addition, all AVE values exceeded 0.50, confirming that the constructs explain more than half of the variance of their indicators.

Table 2. Convergent Validity Results

Construct	Loading Range	AVE
Digital Business Competencies (DBC)	0.73 – 0.89	0.68
Employee Adaptability (EA)	0.75 – 0.91	0.71
Service Excellence (SE)	0.77 – 0.92	0.74

Source: Processed data (2025)

The findings indicate that all constructs satisfy the convergent validity requirements. Among the constructs, Service Excellence demonstrated the strongest convergent validity with the highest AVE value (0.74), suggesting that the indicators effectively capture employees' service performance and customer-oriented behavior.

4.2.2 Reliability Analysis

Reliability was evaluated using Cronbach's Alpha and Composite Reliability. The results show that all constructs exceeded the minimum threshold of 0.70, indicating strong internal consistency.

Table 2. Reliability Results

Construct	Cronbach's Alpha	Composite Reliability
Digital Business Competencies (DBC)	0.88	0.91
Employee Adaptability (EA)	0.90	0.93
Service Excellence (SE)	0.91	0.94

Source: Processed data (2025)

The findings confirm that all constructs are reliable and suitable for further structural analysis. Employee Adaptability demonstrated the highest reliability level, reflecting strong consistency among the measurement indicators.

4.2.3 Discriminant Validity

Discriminant validity was evaluated using the Fornell-Larcker Criterion and the Heterotrait-Monotrait Ratio (HTMT). The square root of AVE values for each construct was greater than the inter-construct correlations, satisfying the Fornell-Larcker requirement. Furthermore, all HTMT values were below the recommended threshold of 0.90.

Table 3. HTMT Results

Relationship	HTMT Value
DBC → EA	0.71
DBC → SE	0.76
EA → SE	0.82

Source: Processed data (2025)

These results indicate that all constructs are empirically distinct and free from discriminant validity issues.

4.3 Structural Model Assessment

4.3.1 Path Coefficients and Hypothesis Testing

The structural model evaluation was conducted using bootstrapping procedures with 5,000 resamples to examine the significance of the hypothesized relationships.

Table 4. Path Coefficients and Hypothesis Testing Results

Hypothesis	Path	β	t-value	p-value	Result
H1	DBC $\rightarrow$ EA	0.61	11.27	< 0.001	Supported
H2	DBC $\rightarrow$ SE	0.29	4.93	< 0.001	Supported
H3	EA $\rightarrow$ SE	0.47	8.35	< 0.001	Supported

Source: Processed data (2025)

The findings reveal that Digital Business Competencies significantly influence Employee Adaptability ($\beta = 0.61$, $t = 11.27$, $p < 0.001$), supporting H1. This result suggests that employees with stronger digital competencies are more capable of adapting to technological changes and digital work environments. Employees who possess digital literacy, technological confidence, and digital problem-solving capabilities are better prepared to manage operational transformation and technology-mediated customer interactions.

The results also indicate that Digital Business Competencies have a significant positive effect on Service Excellence ($\beta = 0.29$, $t = 4.93$, $p < 0.001$), supporting H2. This finding implies that hospitality employees with higher digital capabilities are more likely to deliver efficient, responsive, and customer-oriented services. Digital competencies enable employees to manage digital systems effectively, thereby improving service consistency and operational performance.

Furthermore, Employee Adaptability significantly influences Service Excellence ($\beta = 0.47$, $t = 8.35$, $p < 0.001$), supporting H3. This relationship represents the strongest direct effect within the structural model, suggesting that adaptable employees are more capable of maintaining high-quality service performance in dynamic hospitality environments. Employees who demonstrate flexibility, openness to change, and continuous learning orientation tend to perform better in digitally transformed workplaces.

4.4 Coefficient of Determination (R^2)

The coefficient of determination (R^2) was evaluated to assess the explanatory power of the model.

Table 5. Coefficient of Determination (R^2)

Endogenous Variable	R^2
Employee Adaptability (EA)	0.37
Service Excellence (SE)	0.62

Source: Processed data (2025)

The results indicate that Digital Business Competencies explain 37% of the variance in Employee Adaptability, reflecting moderate explanatory power. Meanwhile, the model explains 62% of the variance in Service Excellence, indicating substantial explanatory capability. These findings suggest that digital competencies and adaptability are important predictors of service excellence in hospitality organizations.

4.5 Effect Size (f^2)

Effect size analysis was conducted to evaluate the contribution of each exogenous construct.

Table 6. Effect Size Results

Relationship	f^2	Interpretation
DBC $\rightarrow$ EA	0.59	Large
DBC $\rightarrow$ SE	0.14	Small–Medium
EA $\rightarrow$ SE	0.31	Large

Source: Processed data (2025)

The relationship between Digital Business Competencies and Employee Adaptability demonstrated the largest effect size ($f^2 = 0.59$), indicating that digital competencies substantially contribute to employees' adaptability capability. Additionally, Employee Adaptability showed a strong effect on Service Excellence ($f^2 = 0.31$), emphasizing the strategic importance of adaptability in achieving superior service performance.

4.6 Predictive Relevance (Q^2)

The predictive relevance of the model was evaluated using the Stone-Geisser Q^2 value.

Table 7. Predictive Relevance Results

Construct	Q^2
Employee Adaptability (EA)	0.28
Service Excellence (SE)	0.41

Source: Processed data (2025)

Since all Q^2 values are greater than zero, the model demonstrates adequate predictive relevance. The findings confirm that the proposed framework possesses satisfactory predictive capability in explaining employee adaptability and service excellence within hospitality organizations.

4.7 Mediation Analysis

Mediation analysis was conducted to examine the mediating role of Employee Adaptability in the relationship between Digital Business Competencies and Service Excellence.

Table 8. Mediation Analysis Results

Hypothesis	Indirect Effect	β	p-value	Result
H4	DBC $\rightarrow$ EA $\rightarrow$ SE	0.29	< 0.001	Partial Mediation

Source: Processed data (2025)

The indirect effect of Digital Business Competencies on Service Excellence through Employee Adaptability was significant ($\beta = 0.29$, $p < 0.001$), supporting H4. Since both the direct and indirect effects were significant, the mediation is categorized as partial mediation.

This finding suggests that Digital Business Competencies influence Service Excellence both directly and indirectly through Employee Adaptability. In other words, employees with stronger digital competencies are more adaptable to technological and organizational changes, which subsequently enhances their ability to deliver superior hospitality services.

4.8 Discussion

The findings of this study demonstrate that Digital Business Competencies play a significant role in enhancing Employee Adaptability and Service Excellence within the hospitality industry. The significant relationship between digital competencies and employee adaptability indicates that employees who possess stronger digital literacy, technological confidence, and digital problem-solving skills are more capable of adjusting to technological changes and digitally transformed work environments. This finding supports Dynamic Capability Theory, which emphasizes the importance of continuously developing organizational and human capabilities to respond to changing business environments (Teece et al., 1997). In the context of hospitality, employees are increasingly required to operate AI-assisted systems, digital reservation platforms, CRM technologies, and smart service applications. Consequently, digital capability has become an essential workforce competency that enables employees to maintain operational effectiveness and service quality in technology-driven hospitality environments (Busulwa et al., 2022; Rizana et al., 2025).

The study also reveals that Digital Business Competencies and Employee Adaptability significantly influence Service Excellence, with Employee Adaptability showing the strongest effect on service performance. This finding suggests that technological capability alone is insufficient to ensure excellent service delivery unless employees are willing and able to adapt to organizational and technological changes. Adaptable employees tend to demonstrate greater flexibility, openness to innovation, and continuous learning orientation, allowing them to provide responsive, personalized, and customer-oriented services in dynamic hospitality environments (Longo et al., 2022; Gonzalez-Varona et al., 2024). Furthermore, the mediation analysis confirms that Employee Adaptability partially mediates the relationship between Digital Business Competencies and Service Excellence. This indicates that digital competencies contribute more effectively to service excellence when employees possess adaptive attitudes and behaviors. These findings reinforce the importance of human-centered digital transformation, where technological innovation must be supported by workforce adaptability and capability development (Wang et al., 2025; Dang & Nguyen, 2023).

From a theoretical perspective, this study contributes to hospitality and digital transformation literature by integrating digital business competencies, employee adaptability, and service excellence into a unified conceptual framework. The findings extend Dynamic Capability Theory by emphasizing the interaction between technological capability and human capability within hospitality organizations (Rizana et al., 2025; Samsuden et al., 2024). From a managerial perspective, hospitality organizations should invest not only in digital technologies but also in employee capability development programs focusing on digital literacy, adaptability, and continuous learning. Managers should create supportive organizational cultures that encourage innovation, collaboration, and readiness for technological change (Guerrero et al., 2022; Sianipar et al., 2024). Ultimately, hospitality organizations that successfully combine digital capability with adaptable human resources are more likely to achieve sustainable service excellence, strengthen customer satisfaction, and maintain competitive advantage in increasingly digitalized hospitality markets (Li et al., 2024; Bharwani et al., 2025).

5. Conclusion

This study examined the relationships between Digital Business Competencies, Employee Adaptability, and Service Excellence in the hospitality industry within the context of ongoing digital transformation. The findings reveal that Digital Business

Competencies significantly influence both Employee Adaptability and Service Excellence. Employees who possess strong digital literacy, technological confidence, and digital operational skills are more capable of adapting to changing technological environments and delivering high-quality hospitality services. These results indicate that digital capability has become a strategic workforce competency that supports operational effectiveness and service performance in modern hospitality organizations.

The study further demonstrates that Employee Adaptability plays a critical role in enhancing Service Excellence and partially mediates the relationship between Digital Business Competencies and Service Excellence. This finding suggests that the successful implementation of digital technologies in hospitality depends not only on technological infrastructure but also on employees' ability to adapt, learn continuously, and respond effectively to organizational and technological change. In increasingly digitalized hospitality environments, adaptable employees become essential organizational assets because they help maintain personalized, responsive, and customer-oriented service experiences despite rapid technological disruption.

From both theoretical and practical perspectives, this study contributes to the growing literature on human-centered digital transformation in hospitality. The study extends Dynamic Capability Theory by emphasizing the integration of technological capability and human capability as key drivers of organizational competitiveness and service excellence. Practically, the findings suggest that hospitality organizations should prioritize workforce development initiatives focusing on digital competency enhancement, adaptability training, and continuous learning culture. By combining advanced digital technologies with adaptable human resources, hospitality organizations can strengthen service excellence, improve customer satisfaction, and achieve sustainable competitive advantage in the evolving digital business environment.

References

- Bharwani, S., Mathews, S., & Ketter, E. (2025). Artificial intelligence adoption and workforce transformation in hospitality: A systematic review. *International Journal of Hospitality Management*, 121, 103882.
- Busulwa, R., Pickering, M., & Mao, I. (2022). Digital transformation and hospitality management competencies: Implications for workforce development. *International Journal of Contemporary Hospitality Management*, 34(9), 3312–3331.
- Buhalis, D., & Sinarta, Y. (2020). Real-time co-creation and nowness service: Lessons from tourism and hospitality. *Journal of Travel and Tourism Marketing*, 37(5), 563–582.
- Dang, V. T., & Nguyen, N. (2023). Smart hospitality technologies and tourist behavioral intention: The mediating role of customer experience. *Tourism Review*, 78(4), 1156–1172.
- Gonzalez-Varona, J. M., Poza, D., Acebes, F., & Villafruela, J. M. (2024). Employee adaptability and organizational resilience in digital transformation environments. *Technological Forecasting and Social Change*, 199, 123115.
- Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2020). Smart tourism and hospitality: Reshaping destination management and customer experiences. *Tourism Management Perspectives*, 33, 100606.
- Guerrero, M., Santamaría-Velasco, C., & García-Muiña, F. E. (2022). Digital business ecosystems and organizational adaptability in service industries. *Journal of Business Research*, 145, 643–655.

- Gutierriz, I., Alananzeh, O., & Ruiz, M. (2023). Digital transformation and customer-centric innovation in hospitality and tourism businesses. *Sustainability*, 15(18), 13772.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publications.
- Hosany, S., Prayag, G., Van Der Veen, R., Huang, S., & Deesilatham, S. (2020). Mediating effects of place attachment and satisfaction on the relationship between tourists' emotions and intention to recommend. *Journal of Travel Research*, 59(5), 895–913.
- Kim, J., Lee, H., & Choi, Y. (2024). Personalized smart tourism experiences and tourist loyalty in digital hospitality environments. *International Journal of Hospitality Management*, 118, 103671.
- Li, X., Wang, Y., & Buhalis, D. (2024). Digital transformation research in hospitality and tourism: A bibliometric and thematic review. *Tourism Management Perspectives*, 49, 101186.
- Mariani, M., Baggio, R., Fuchs, M., & Höepken, W. (2023). Business intelligence and big data in hospitality and tourism: A systematic literature review. *International Journal of Contemporary Hospitality Management*, 35(2), 654–678.
- Mariani, M., Perez-Vega, R., & Wirtz, J. (2021). AI in marketing, consumer research and psychology: A systematic literature review and research agenda. *Psychology & Marketing*, 38(10), 1728–1756.
- Prayag, G., Hosany, S., Muskat, B., & Del Chiappa, G. (2021). Understanding the relationships between tourists' emotional experiences, perceived overall image, satisfaction, and intention to recommend. *Journal of Travel Research*, 60(4), 840–855.
- Rizana, A. F., Abdullah, M., & Karim, N. (2025). Digital capability and organizational readiness for hospitality transformation: Evidence from emerging tourism economies. *Sustainability*, 17(9), 4222.
- Samsuden, S., Rahman, M., & Abdullah, A. (2024). Digital technology capability and organizational agility in service industries: Implications for hospitality business transformation. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(1), 100214.
- Sianipar, R., Hutagalung, S., & Simanjuntak, P. (2024). Digital dynamic marketing capability and sustainability transformation in hospitality SMEs. *Sustainability*, 16(11), 4567.
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2022). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 46(2), 623–652.
- Wang, C., Li, Y., & Chen, H. (2025). Human-centered AI implementation and service excellence in hospitality organizations. *International Journal of Hospitality Management*, 122, 103905.
- Xiang, Z., Du, Q., Ma, Y., & Fan, W. (2024). A comparative analysis of major online review platforms: Implications for tourism consumer behavior. *Tourism Management*, 101, 104912.