

Impact of information technology on the factors constituting the competitive ability of 2- and 3- star hotels in Hanoi

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Abstract

Purpose: This research is crucial to understand how information technology affects the competitive ability of 2- and 3-star hotels in Hanoi, providing valuable insights for the hospitality industry to adapt and thrive in the digital era.

Method: This empirical research, conducted in Hanoi, investigates how information technology influences the competitive ability of 2- and 3-star hotels. The study utilized data from reliable sources to establish a theoretical basis and five research hypotheses. To test these hypotheses, a survey was conducted with key hotel personnel, including Board of Directors, Chief Accountants, and Department Leaders, yielding 172 valid responses out of 267 questionnaires distributed. The questionnaire encompassed 17 questions corresponding to five groups of factors related to competitive ability. Data collection employed Google Forms as the online platform, with 95 responses failing to meet the survey requirements. Data analysis involved assessing scale reliability, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM) using SPSS 20.0 and AMOS 20.0 software, ultimately exploring the relationship between information technology and competitive abilities in these hotels..

Result: The results show that information technology has positive impacts on the 05 factors that constitute the competitiveness of 2- and 3-star hotels in Hanoi: market-oriented ability, marketing ability, organizational management ability, resource mobilizing ability, and social capability.

Contribution: The research addresses a significant and relevant area in the field of hospitality and technology while providing valuable insights into how information technology adoption can enhance the competitive ability of 2- and 3-star hotels in Hanoi. Moreover, the findings may have implications for policymakers and industry stakeholders. It could inform government initiatives or industry associations on how to support IT adoption and competitive ability in the hospitality sector. At the same time, it can also contribute to the broader discussion on the role of technology in the hospitality industry and its implications for both businesses and consumers in future research.

Keywords: Information technology application, hotel competitiveness, competitive ability, 2-star hotels, 3-star hotel

Introduction

As society continues to embrace an increasingly sophisticated and convenient lifestyle, the information technology sector has been a driving force behind these advancements. Information technology not only enhances daily convenience but also serves as a critical tool for transmitting information and improving business efficiency. Nations worldwide are increasingly recognizing the pivotal role of information technology in national economic development (Alkandari et al., 2017; Bagheri & Habibi, 2018). In the realm of the hospitality and tourism industry, information technology has established itself as a vital factor for gaining



a competitive edge (Kim et al., 2017; Xiang et al., 2017). It has been seamlessly integrated into hotel operations to boost efficiency and offer enhanced value to tech-savvy customers seeking immersive digital experiences (Nugroho 2020).

Looking ahead, technologies like 5G, IoT, cloud computing, AI, big data, AR, and VR are expected to gain prominence across multiple sectors, including tourism and hospitality (Zhang et al., 2018). In this rapidly evolving digital landscape, hotels, particularly 2- and 3-star establishments in Vietnam, often categorized as small and medium enterprises with limited resources, must elevate their technological prowess to remain competitive. Information technology is not just a desirable feature; it is a necessity and a powerful tool for enhancing business competitiveness in the digital age.

While the impact of information technology on business competitiveness has been explored in previous studies, there remains a significant gap in the literature pertaining to how information technology specifically influences the factors constituting the competitive ability of 2- and 3-star hotels in Hanoi (Chathoth et al., 2016; Sigala et al., 2017). This research gap underscores the pressing need to investigate this crucial area and gain insights into how these hotels can harness technology to gain a competitive edge in an ever-changing market landscape.

Given the contemporary practical and theoretical context outlined above, the selected topic is "Impact of information technology on the factors constituting the competitive ability of 2- and 3-star hotels in Hanoi" for this scientific research project. By exploring this uncharted territory, the aim is to make a timely contribution to the field of hospitality management and information technology, offering actionable recommendations for small and medium-sized hotels seeking to enhance their competitive abilities in the digital age.

Hotel

According to the Oxford Dictionary, "a hotel is a commercial establishment that provides accommodation for tourists and sometimes for permanent residents, and often includes restaurants, meeting rooms, stores, and other facilities for public use". Hotels provide accommodation, meals, and other services for tourists and travellers, and may also offer additional facilities such as banquet and meeting rooms, recreational activities, and tourist guidance services (Buhalis and Law, 2008). Adeyemo et al. (2015) defined a hotel as a place that provides overnight accommodation, meals, and other services primarily for tourists, travellers and those seeking temporary residences. According to Vietnam Ministry of Culture, Sports, and Tourism (2008), "Hotel is tourist accommodation that has a scale of at least 10 bedrooms, ensuring quality in terms of infrastructures, equipment, and necessary services for guest lodging and use of services. It includes city hotel, resort hotel, floating hotel, and motel". This concept of hotel was decided to use for this research and the star rating classification method from Vietnam Ministry of Culture, Sports and Tourism was also used as the basis for selecting the survey objects of 2- and 3-star hotels in Hanoi.

Hotel's competitive ability

The significance of businesses' competitive ability extends beyond enterprise interests, encompassing broader economic and policy dimensions. Despite its multifaceted importance, competitive ability lacks a universally accepted concept and a precise definition. One widely recognized definition posits that competitive ability involves the creation of unique technological processes to produce high-value products aligned with customer needs, while simultaneously maintaining cost-efficiency and productivity to enhance profitability (Porter, 1985). D'Cruz and Rugman (1992) offer an enterprise-centric perspective, defining competitive ability as the capacity to design, produce, and market superior products, accounting for both quality and pricing factors. Additionally, competitive ability can be framed as the integration of internal resources and capabilities to sustain and expand market share, profitability, and competitive advantages in the face of direct and potential competitors within a target market (Nguyen, 2004). Drawing from these foundational concepts, this study posits a

definition for hotel competitive ability: a hotel's capacity to generate high added-value tailored to customer needs while maintaining cost-effectiveness and productivity to bolster profitability.

The concept of competitive ability within businesses has been a subject of extensive research, with numerous studies dedicated to identifying and analyzing factors that influence a company's competitive ability. Building upon prior research related to the competitive ability of tourism enterprises (Cragwell, 2007; Thompson et al., 2007; Tsai et al., 2009; Phan et al.,

2017; Nguyen, 2020), this study identifies and proposes five factors constituting the competitive ability of 2 to 3-star hotels in Hanoi:

1. **Market-oriented ability:** Competitive ability derives from market responsiveness, where enterprises excel by meeting customer needs and delivering value-added products. Market orientation, recognized as a vital source of competitive advantage (Kohli and Jaworski, 1990), has been extensively explored in marketing, sales, management, and competitive ability research (Dobni and Luffman, 2003; Kirca et al., 2005).
2. **Marketing ability:** Effective marketing activities enable enterprises to engage customers, influence their decision-making processes, and cultivate loyalty. Marketing capability encompasses the optimal deployment and integration of various marketing inputs to achieve high sales at low cost (Ang et al., 2022).
3. **Organizational management ability:** Effective organizational management entails the application of modern management methodologies that have yielded success in various countries, including situational management, process-oriented management, and systems-oriented management. These methods empower businesses to enhance their competitive ability in the market.
4. **Resource mobilizing ability:** Competitive ability amalgamates the strength of existing and accessible resources, spanning human resources, physical assets, financial resources, organization, and experience. Consequently, resource mobilizing capability serves as a pivotal factor in constituting a hotel's competitive ability.
5. **Social ability:** Social capability encompasses a hotel's aptitude for learning, adapting, coping, and advancing amid specific changing conditions.

Research Method

The primary goal of this research is to investigate how information technology influences the competitive ability of 2- and 3-star hotels in Hanoi. To accomplish this objective, the research used data collected from reliable resources to build theoretical basis and research hypothesis. Based on the systematization of theoretical background, the study proposed a research model with 5 hypotheses:

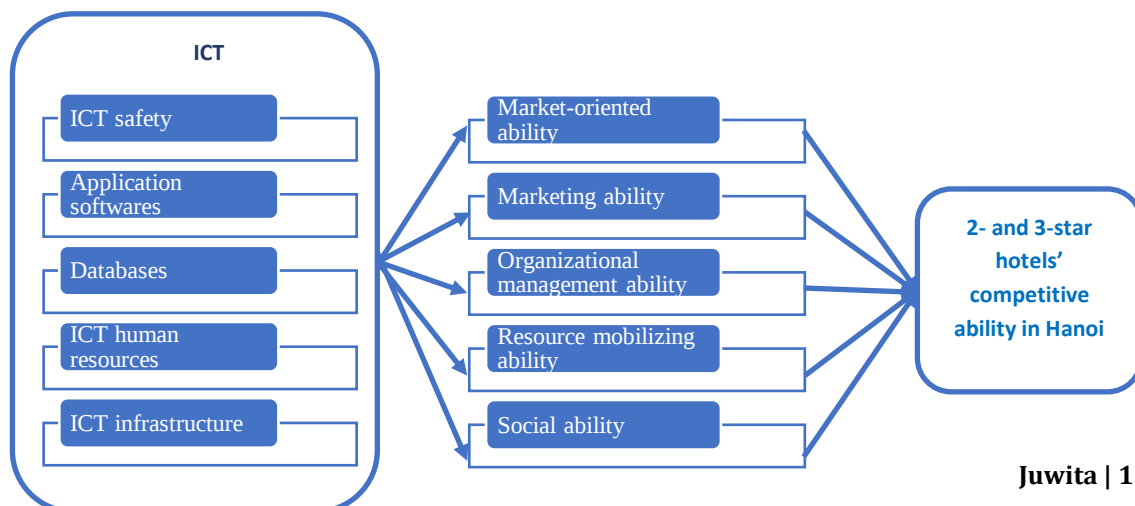


Figure 1: Research model

Source: Research result

- There is a relationship between information technology and the market-oriented ability constituting the competitive ability of 2- and 3-star hotels in Hanoi.
- There is a relationship between information technology and marketing ability constituting the competitive ability of 2- and 3-star hotels in Hanoi.
- There is a relationship between information technology and organizational management ability constituting the competitive ability of 2- and 3-star hotels in Hanoi city.
- There is a relationship between information technology and the resource mobilizing ability constituting the competitive ability of 2- and 3-star hotels in Hanoi.
- There is a relationship between information technology and social ability constituting the the competitive ability of 2- and 3-star hotels in Hanoi.

To test the hypothesis, a survey was conducted within these hotels from individuals in key roles, such as the Board of Directors, Chief Accountants, and Department Leaders. This approach was chosen to obtain insights from individuals with a comprehensive understanding of their respective departments and the overall hotel operations.

The main part of the questionnaire consists of 17 questions corresponding to 17 observed variables belonging to 5 groups of factors (Market-orientated capacity, marketing capacity, organizational management capacity, resource mobilizing capacity, and social capacity). The general assessment section provides questions about each factor for the survey respondents to make general judgments and assessments about the impact of information technology on the factors constituting the competitive ability of the competitive ability in Hanoi.

Survey was conducted through Google forms, an online questionnaire platform. The survey questionnaire can be summarized as follows:

- Total number of questionairs distributed: 267
- Total number of invalid responses: 95
- Total number of valid responses: 172

The study used SPSS 20.0 and AMOS 20.0 software to process the coded data with the following steps:

- (i) Testing the reliability of the scale through Cronbach's Alpha coefficient.
- (ii) Performing exploratory factor analysis (EFA) to evaluate the convergent value and discriminant value of the scales.
- (iii) Analyzing confirmatory factor analysis (CFA) is conducted to verify the appropriateness of the measurement scale in terms of composite reliability, extracted variance, unidimensionality, convergence, and discriminant validity.
- (iv) Performing SEM to estimate measurement models and structural models for multivariate theoretical problems.

Result and Discussion

Results

Respondents' characteristics

The subjects of the survey are the Board of Directors; Chief accountant; Heads of departments working in 2- and 3-star hotels in Hanoi. 267 questionnaires were distributed. Among them, 95 questionnaires were invalid. The survey was encrypted and processed using SPSS and AMOS for Windows version 20.0 software. The main demographic characteristics of the survey's respondents are shown in Table 1.

Table 1: Survey respondents' characteristics

N = 172	Frequency	Percentages
Gender		
Male	76	43.33%
Female	96	56.67%

Other	0	0.00%
Age		
16 – 25	19	11.1%
26 – 35	61	35.6%
36 – 50	63	36,7%
Above 50	29	16.7%
Positions in hotels		
Board of Directors	36	20.93%
Chief accountant	63	36.63%
Heads of departments	73	42.44%
Working time in current hotels		
Under a year	30	17,78%
1 – 5 years	82	47.78%
5 – 10 years	50	28.89%
Over 10 years	10	5.56%

Source: Research Result generated from SPSS, 2023

The scale's reliability

Table 2: Reliability Statistic

No	Factors	Cronbach's Alpha	Numbers of Items
1	Market-oriented capability (DHTT)	.751	3
2	Marketing capacity (MKT)	.884	5
3	Organizational management capacity (TCQL)	.824	3
4	Resource mobilizing capacity (HDNL)	.776	3
5	Social capacity (QHXX)	.849	3
6	Hotels' competitive ability (NLCT)	.724	3
7	Information technology (CNTT)	.841	5

Source: Research Result generated from SPSS, 2023

The scale of the study consists of 7 components with 25 observed variables. According to the results of the Cronbach Alpha analysis, after testing the reliability level through the Cronbach Alpha coefficient, none of the variables were excluded. The Cronbach's Alpha value of the observed variables are as follows: DHTT (0.751), MKT (0.884), TCQL (0.824), HDNL (0.776), QHXX (0.849), NLCT (0.724) and CNTT (0.841).

Exploratory factor analysis

Table 3: Rotated component matrix

	Components				
	1	2	3	4	5
MKT3	.810				
MKT1	.819				
MKT2	.829				
MKT4	.767				
MKT5	.763				
QHXX1		.918			
QHXX2		.870			
QHXX3		.831			
TCQL2			.878		
TCQL1			.877		
TCQL3			.813		
HDNL3				.865	
HDNL2				.862	

HDNL1				.576	
DHTT3					.817
DHTT1					.767
DHTT2					.687

Source: Research Result generated from SPSS, 2023

According to the analysis results of KMO and Bartlett's Test:

- $0.5 \leq \text{KMO} = 0.730 \leq 1$: factor analysis is accepted with the research data.
- Sig Bartlett's Test = $0.000 < 0.05$: factor analysis is appropriate.
- The EFA results obtained all components. Hence, the scale is accepted, 17 observed variables are grouped into 5 factors.

Thus, through the results of Cronbach Alpha coefficient analysis and exploratory factor analysis, the original research model with 5 proposed components is satisfactory (no variables are excluded) and statistically significant. The above variables will be used in the next analysis.

For the dependent variables:

- For hotels' competitive ability component

According to the analysis results of KMO and Bartlett's Test:

- + $0.5 \leq \text{KMO} = 0.658 \leq 1$: factor analysis is accepted with the research data.
- + Sig Bartlett's Test = $0.000 < 0.05$: factor analysis is appropriate.
- For information technology component

According to the analysis results of KMO and Bartlett's Test:

- + $0.5 \leq \text{KMO} = 0.821 \leq 1$: factor analysis is accepted with the research data.
- + Sig Bartlett's Test = $0.000 < 0.05$: factor analysis is appropriate.

Confirmatory Factor Analysis (CFA)

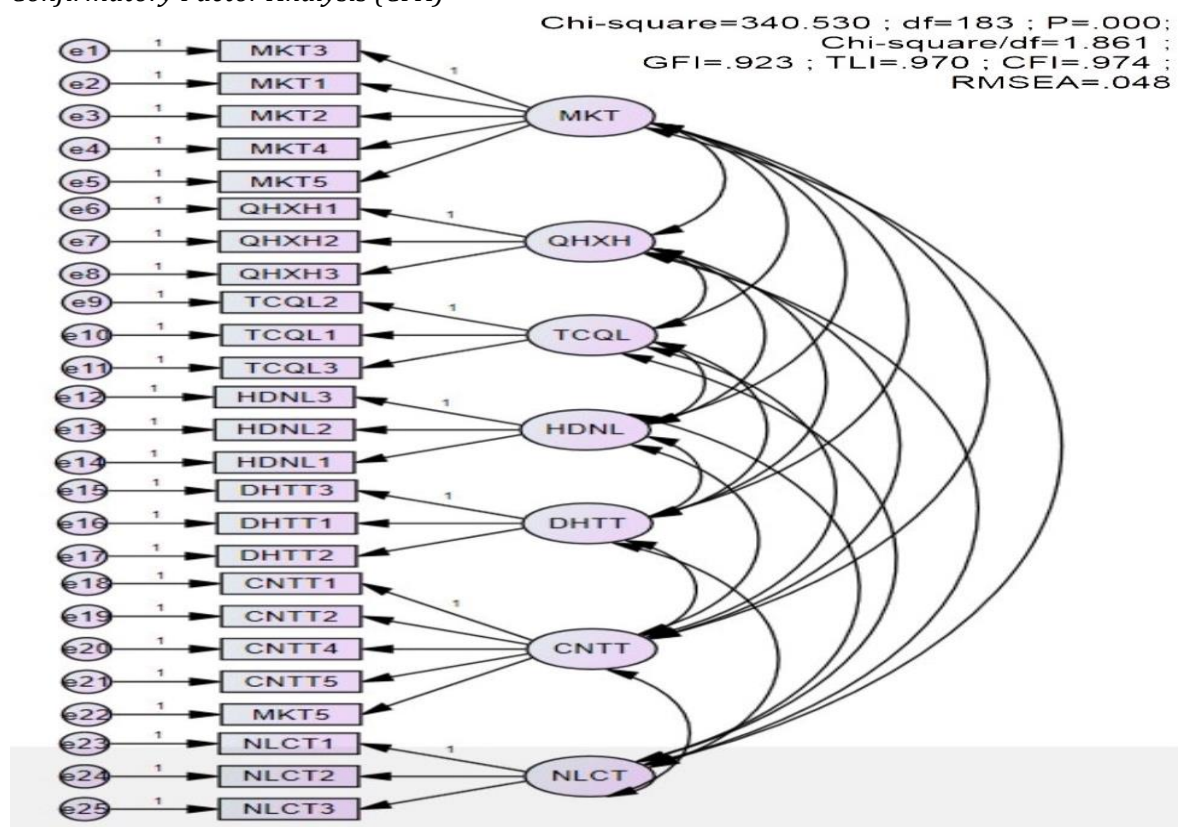


Figure 2: Confirmatory Factor Analysis Result

Source: Research Result generated from SPSS, 2023

To assess the fit of the model, this study used the following criteria: Chi-squared (requirement: $P > 5\%$); chi square adjusted for degrees of freedom ($CMIN/DF < 3$); $TLI > 0.9$ and $RMSEA < 0.05$. Through the analysis results shown in Figure 2, the evaluation of the model is as follows:

- Relevancy: Chi-square/df = 1.861; $TLI = 0.970$; $CFI = 0.974$; $RMSEA = 0.048$. It can be said that the model fits the data.
- Convergence value: The normalized weights > 0.5 and the unnormalized weights are statistically significant ($P < 0.05$), so the observed variables all have convergent values.

Table 4: Confirmatory Factor Analysis Result

			Estimate	SE	CR
CNTT	↔	MKT	,106	,014	7,533
CNTT	↔	TCQL	,112	,015	7,668
CNTT	↔	HDNL	,090	,013	7,136
CNTT	↔	NLCT	,124	,017	7,464
CNTT	↔	QHXH	,161	,018	9,031
CNTT	↔	DHTT	,153	,019	8,056
DHTT	↔	NLCT	,109	,018	6,118
DHTT	↔	MKT	,106	,015	6,847
DHTT	↔	QHXH	,157	,020	7,913
DHTT	↔	HDNL	,062	,013	4,797
DHTT	↔	TCQL	,096	,015	6,313
TCQL	↔	MKT	,078	,012	6,489
TCQL	↔	HDNL	,119	,016	7,443
TCQL	↔	NLCT	,036	,010	3,541
TCQL	↔	NLCT	,119	,016	7,443
MKT	↔	QHXH	,104	,014	7,179
MKT	↔	HDNL	,060	,010	5,823
MKT	↔	NLCT	,076	,013	5,748
HDNL	↔	QHXH	,126	,018	7,111
HDNL	↔	NLCT	,052	,013	4,078
NLCT	↔	QHXH	,088	,013	6,545

Source: Research Result generated from SPSS in 2023

Linear SEM model

After considering the fit of the model: Chi-square/df = 1,773; $IFI = 0.933$; $TLI = 0.924$; $CFI = 0.933$; $RMSEA = 0.047$, the study obtained the final estimation model, information technology has positive impacts on the five components constituting competitive ability of 2–3-star hotels in Hanoi.

Based on the above analysis, the 5 suggested hypotheses are accepted.

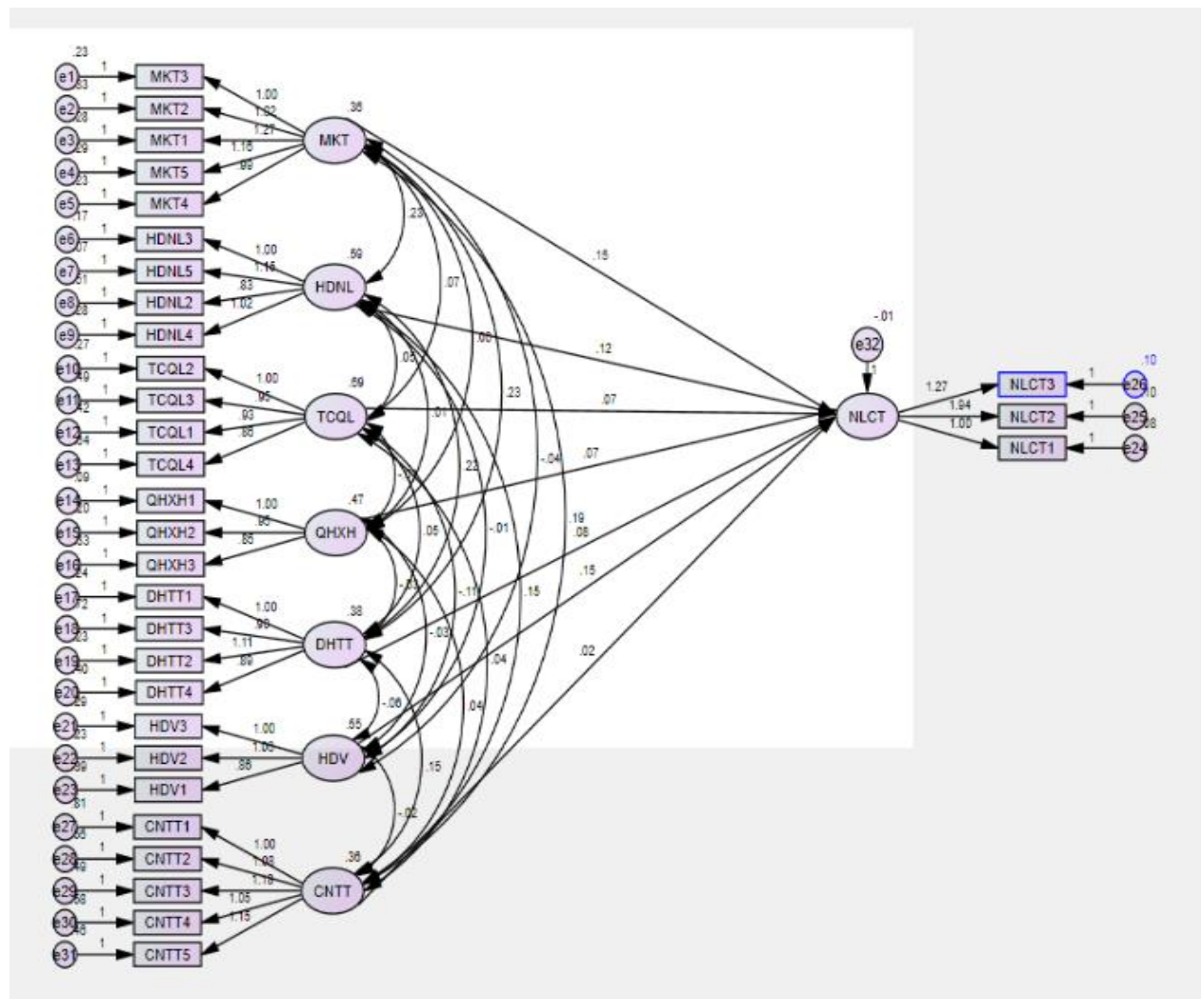


Figure 3: SEM Model

Souce: Research Result generated from SPSS, 2023

Discussion

The research findings shed light on the crucial role of information technology (IT) in enhancing the competitive abilities of 2-to-3-star hotels in Hanoi. These findings align with relevant theories and previous research, emphasizing the transformative potential of IT in the hospitality industry.

The study identified a positive relationship between the impact of information technology and market-oriented capability. This implies that 2-to-3-star hotels in Hanoi that effectively leverage IT tools like online booking systems and data analytics tend to be more market-oriented. This finding resonates with the Resource-Based View (RBV) theory, which suggests that IT can be a valuable resource that contributes to a hotel's competitive advantage (Barney, 1991). The research also revealed a positive connection between IT impact and marketing capacity. Hotels that use IT for digital marketing strategies, including social media campaigns and personalized customer engagement, tend to exhibit stronger marketing capacities. This finding is in line with the Marketing 4.0 concept, which highlights the significance of digital marketing in today's competitive landscape (Kotler et al., 2021). Moreover, the study indicates that IT positively impacts organizational management capacity, suggesting that systems such as property management software and automated task allocation

enhance the efficiency and effectiveness of hotel operations. This aligns with the concept of "digital transformation" in management, emphasizing the role of IT in optimizing processes and resource allocation (Lacity et al., 2020). Besides, the research highlights a positive relationship between IT impact and resource mobilizing capacity, indicating that hotels utilizing IT for procurement and resource allocation are better equipped to adapt to changing market dynamics. This finding corresponds with the Dynamic Capabilities theory, which emphasizes the role of IT in building adaptive capabilities (Teece et al., 1997). Lastly, the study also uncovered a positive link between IT impact and social capacity. Hotels that use IT for guest engagement and community building tend to have stronger social capacities. This supports the Social Capital theory, which underscores the role of social networks and relationships in gaining a competitive edge (Nahapiet & Ghoshal, 1998).

In summary, the research findings reinforce the idea that information technology plays a pivotal role in enhancing the competitive abilities of 2-to-3-star hotels in Hanoi. These findings are not only consistent with theoretical expectations but also align with previous research in the field of IT and hospitality. Embracing IT as a strategic asset can empower hotels to be more market-oriented, efficient in marketing, effective in organizational management, agile in resource mobilization, and socially engaged. Consequently, IT investments should be considered a critical component of the competitive strategy for hotels in the digital age.

Conclusion

Information technology has positive impacts on the five factors constituting the competitive ability of 2- and 3-star hotels in Hanoi which include: Market-oriented ability, marketing ability, organizational management ability, resource mobilizing ability, and social ability. To enhance their competitive ability, 2- and 3-star hotels in Hanoi can take advantage of information technology and apply it in their business operations to improve each component of competitive ability. Due to some limitations of research resources, this study just focuses on examining the general impact of information technology on five factors constituting the competitive ability of 2–3-star hotels in Hanoi. This is also the gap for the next research to clarify the impact of up-to-date specific technology on the competitive ability of hotel businesses.

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