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A CONFIRMATION OF ELEMENTAL FACTOR TOWARD PERCEIVED PORT QUALITY

Tanapon Rungroueng[1] and Paithoon Monpanthong[2,*]

Abstract

There is currently a lack of up-to-date knowledge on the fundamental variables as elemental factors that influence perceived cruise-port quality. This research aims to examine the confirmatory components of those factors in reflective and formative terms in order to develop a set of perceived port quality (PPQ) variables. The study adopts a quantitative research methodology, collecting data via a questionnaire survey. The research sample consisted of 305 respondents, while the collected data were analyzed using GSCA Pro software version 1.1.6. The research findings reaffirm the elemental factors of perceived port quality (PPQ), constructed from the following five significant categories as first-order constructs, namely cruise terminal facilities, port service encounter performance, port location, ground port transportation, and physical port environment quality. These were assessed through the 36 observed variables in this study, which included significant reflective and formative constructs. Executives, cruise tourism managers, and ports, will be able to use the results of the study as guidelines for designing policies and strategies to develop cruise tourism in the port area. Meanwhile, academics may employ these sets of variables to examine in combination with other factors in future research.

Keywords: Cruise Tourism, Cruise Port, Elemental Factor, Perceived Port Quality

1. INTRODUCTION

World cruise tourism has grown at a continuous rate for over 30 years. According to a report from the Cruise Lines International Association or CLIA, cruise tourism has had a significant growth rate within the last 10 years. From 2009 to 2018, the number of cruise passengers went up from 17.9 million people to 28.5 million people, amounting to 60% growth, higher than ground tourism (CLIA, 2019a; Rungroueng, 2020). In 2019, Chinese passengers who joined cruise tourism increased to over 2.4 million people, ranking

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second-highest worldwide. Meanwhile, Australian passengers also had a high growth rate, with cruise tourism surging to over 1.34 million people in 2019, giving Australia the fifth-highest world rank (CLIA, 2019a). With the significant growth rate of cruise business, this affects the cruise business itself such as cruise's size, main target, route, port, price, duration, goods, and service and shore excursions. Regarding the management of cruise business in each country, many countries are focusing on concrete development. For example, specifying policy, development plans, responsibilities, and developing physical facilities including the port, infrastructure, and other facilities, even tourism products and tourism services, to meet the growth rate and take opportunities in business competition.

In Asia, cruise tourism business is the newest form of tourism and has had the quickest growth rate. According to Cruise Lines International Association or CLIA, the need for cruise tourism increased steady during 2012 – 2019. During this time, it went up from 777,500 people to 4.02 million people, amounting to a 419% growth rate and generating the biggest cruise tourism business and the highest tourist growth (CLIA, 2019b; Rungroueng, 2020). Moreover, the World Tourism Organization have reported an expected 30% increase in cruise tourism around Asia, from 1.8 million tourists worldwide, by the year 2030 (UNWTO, 2016). Furthermore, the growth rate in Asia during the last 3-5 years has been high, despite being low compared with worldwide figures. The huge Asian population combined with rapid growth in its economy have given Asia a high potential to increase the number of cruise passengers. Due to the increasing trend of cruise tourism, many first-class cruise lines are trying to get their ships into Asia. At present, the market of cruise tourism has potential when considering the movements of various countries in Asia. The effect of the progress in Asia is that nowadays SEA and ASEAN are famous destinations for cruise tourism, causing high competition between ports. This has resulted in countries in the ASEAN region extending their ability to service customers in their ports in order to support the number of large cruises (Asean Cruise New, 2016). Later, many big cruise lines decided to bring their service to the ASEAN region more frequently such as Royal Caribbean International (RCCL), Costa, Princess, Celebrity, Seabourn, Silver Sea, and Star Cruises. Nevertheless, some countries such as Indonesia, Vietnam, Malaysia, and Thailand remain the most popular with Singapore harbor as the main port (Turnaround Port or Home Port) as it can attract a many more cruises with its variety in attractions and great transportation links.

It can be concluded that cruise tourism in ASEAN is encountering high popularity among cruise passengers, while many countries in ASEAN are also developing as centers of cruise tourism in the region. With the present state of cruise tourism worldwide, Thailand still has a chance to be one more destination for a world-class cruising business in the future. Thailand has offered cruising services for over 30 years. This started with small cruises taking passengers in during high season. The number of cruises in each season was not high. Later, the Star Cruises company brought passengers in to Thailand, stopping by Phuket port, Samui port, and Laem Chabang port. Meanwhile, other companies have also started planning their routes to Thailand (Monpanthong, 2015). One report from CLIA showed that cruise tourism in Thailand has been growing continuously from 2014 to 2019. Cruise docking at ports in Thailand in 2015 was 28% higher than it was in 2014, but in 2016 it decreased 22%. Nevertheless, when comparing 2016 and 2017 there was a 75% increase. Thailand was planned as a cruise destination 509 times in 2017, with Thailand able to support over 624,000 tourists. Cruise tourism made over 3.5 billion baht for the country. The main ports are Phuket port and Laem Chabang port (CLIA, 2017). In 2018, Thailand ranked 3rd place in Asia on its ability to support cruise passengers with cruise docking occurring 581 times, a 14% growth from 2017. Phuket supported over 219 cruise dockings while Laem Chabang supported 149, with over 67 dockings being overnight.

These were the highest figures compared to other ports in Thailand (CLIA, 2017). However, with the economic state of the country and political instability, growth decreased 5% in 2019 (CLIA, 2019b).

In conclusion, even though Thailand's ports can provide the necessary support, huge international cruises remain absent from Thailand. The country itself is attractive enough for passing cruises to stop by. This reflects traveling potency around Laem Chabang, Phuket, and Samui port areas. If there is greater port development, this will attract more cruises and make passengers feel more satisfied in the future, in turn leading to increasing income. Therefore, generating solid principles for developing cruise tourism, which include all important keys and cooperation from as many related organizations as possible, is a crucial and essential matter at hand, prompting this research.

2. LITERATURE AND RELATED THEORY REVIEW

Concept of Perceived Quality

The Definition and Concept of Perceived Quality (Port)

Robbins (2003) stated that the term "perception" refers to a process through which people categorize or interpret their inputs in order to give their surroundings meaning. As opposed to mental factors, which are made up of past knowledge, needs, and attitudes, cognitive factors are determined by the senses. Three processes make up perception: selection, interpretation, and emotions. All five types of sensory organs—the eyes, ears, nose, tongue, and skin—are used by humans to produce perception. According to influences or elements that affect perception, such as the receiver's traits and the stimuli, perception will happen more or less. In this regard, Schmitt (1999) categorized experiences into five aspects: social experience, emotional experience, knowledge-and understanding-producing experience, physical experience, and behavior and lifestyle experience. These aspects of experiential perception foster relationships with reference groups at different levels, in turn fostering experiences through senses, feelings, thoughts, actions, and relationships to foster good memories, positive experiences for clients or passengers, positive word-of-mouth, and return visits. Quality is typically seen as being at or above the level of the customer's expectations when it comes to products and services. In the context of tourism, the visitor's happiness with the experience is measured by a comparison between what was expected and what was actually delivered (Battour, 2017; Murphy, Pritchard, & Smith, 2000; Napontun et al., 2023; Tongkaw, 2021).

In addition, Zeithaml (1988) explains how perceived quality is distinct from real quality as it includes the customer's comprehensive overall evaluation of the experiences at a higher level of abstraction. It's important to note that the measurement of perceived quality is based on the tenet that customers develop their perception of perceived quality primarily through a memory of different elements of the whole experience. Following these premises, perceived quality was conceptualized within the cruising experience to destination port of call as the overall assessment of all relevant perceived positive accumulated aspects of port quality, which subsequently form the second-order construct of perceived quality.

Many of the recent studies on service quality have followed on from the work of Parasuraman, Zeithaml, and Berry (1988) and Gronroos (1984). The SERVQUAL instrument (Parasuraman et al., 1988) includes five dimensions: tangibles, responsiveness, assurance, empathy, and reliability. The model by Gronroos (1984) defines technical and functional quality, which relate to results and processes, respectively; these are the two dimensions of quality that constitute service. Relational quality (staff-customer interactions) and physical quality (tangibles like facilities and equipment) are subdimensions of the functional quality dimension (describing the process dimension), which is comparable to the process dimensions presented in

the SERVQUAL model (Parasuraman et al., 1988; Rungroueng, 2015; Rungroueng & Suveatwatanakul, 2015a, 2015b; Suwannakul & Khetjenkarn, 2022; Võ, 2021). In Brady and Cronin's (2001) model, three second-order dimensions, interactional (relational) quality, physical environmental quality, and outcome quality, can be made up of nine first-order subdimensions, such as tangibles, waiting time, and staff attitude. Despite being widely used, the SERVQUAL instrument for evaluating quality ignores significant elements unique to travel destinations (such as attractions, entertainment, and cultural experiences) (Žabkar, Brenčič, & Dmitrović, 2010). The "bundle of components" that make up a tourist product—which includes lodging, transportation, dining, entertainment, and other aspects—must be captured in research in order to assess the destination's perceived level of quality (Praditbatuga, Treetipbut, & Chantarak, 2022; Žabkar et al., 2010). In their study of perceived quality in Slovenia, Žabkar et al. (2010) adapted the six A's framework—"attractions," "access," "amenities," "ancillary services," "available packages," and "activities" (see also Buhalis, 2000; Cooper, Fletcher, Gilbert, and et al., 1993) to operationalize a perceived quality construct that consists of nine destination characteristics (accessibility, cleanliness, variety, locals, rest, safety & security, nature, and local food). The authors argued that the "relevant destination attributes are highly contextual, and that the measurement of quality should reflect the specificity of a destination's features" (Žabkar et al., 2010).

Baker and Crompton (2000) conceptualized perceived quality as customers' opinions of how well a provider performs; satisfaction, on the other hand, gauges how they feel after experiencing the performance. In various service situations, previous research has sought to explain the connection between perceived quality and overall satisfaction. Cronin, Brady, and Hult (2000) revealed that in service settings such athletic events, entertainment, healthcare, long distance carriers, and fast food restaurants, consumer perception of perceived quality had a direct impact on customer satisfaction. Andaleeb and Conway (2006) indicated that in the restaurant business, meal quality and staff response were important determinants of customer satisfaction. In the cruise line industry, Lobo (2008) discovered that all aspects of perceived quality—specifically, tangibles, dependability, responsiveness, certainty, and empathy—were highly connected with total customer satisfaction. Cruise passengers could notice the onboard quality during the cruise experience since services need customers to be present during the consumption process, which in turn influences satisfaction. In the context of cruise tourism, cruise customers can perceive the quality of Thailand cruise tourism elements from main elements such as the port which correspond to the review of port literature. Synthesis of the elements by analyzing the data in the form of SEM, PLS-SEM, and others, leads to the summary shown in Table 1.

Table 1 considers 5 key attributes as follows: (1) Cruise terminal facilities (2) Port service encounter performance (3) Port location (4) Ground transportation of the port and (5) Port physical environment quality, which are overall components of the port used in previous studies. Therefore, this research took these relevant issues to be defined as variables in the study.

If considering only the results of the SEM and PLS-SEM data analysis, there are 10 studies from 2008-2023. It was determined that more than half of these studies used formative second-order constructs. Therefore, this research took the above-mentioned issues to define as a measurement model, as explained in detail in the next section.

The Measurements of Perceived Port Quality

According to the perceived port quality's literature review, from the collection and synthesis of port components, especially data analysis to test the relationship of the models,

Table 1 Element of Port Attributes

Authors	**Port Attributes**					**Model and Construct Approach**		
	Cruise terminal facilities	Port service encounter performance	Port location	Ground transportation of the port	Port physical environment quality	SEM or PLS-SEM	Second-order	Formative
Kwortnik (2008)		√			√			
Satta, Parola, Penco, and Persico (2015)	√	√		√	√			
Forgas-Coll, Palau-Saumell, Sanchez-Garcia, and Garrigos-Simon (2015)		√				SEM		
B. L. Chua, Lee, and Han (2015)	√	√			√	SEM		
Cardenas-Garcia, Pulido-Fernandez, and Pulido-Fernandez (2016)	√			√	√			
Sanz-Blas, Carvajal-Trujillo, and Buzova (2017)	√	√			√	PLS-SEM	√	√
Lee, Chua, and Han (2017)		√			√	SEM		
Lyu, Hu, Hung, and Mao (2017)	√	√			√			
B. L. Chua, Lee, Kim, and Han (2017)	√	√			√	SEM		
Whyte (2017)	√		√	√	√			
Mustelier-Puig, Anjum, and Ming (2018)		√				PLS-SEM	√	√
Shahijan, Rezaei, and Amin (2018)		√				PLS-SEM	√	√
Wu, Cheng, and Ai (2018)	√	√	√	√	√	PLS-SEM	√	√
Ma, Fan, and Zhang (2018)		√	√	√				
Muskat, Hortnagl, Prayag, and Wagner (2019)	√	√			√	PLS-SEM	√	√
Jiang (2019)		√				SEM		
Tao and Kim (2019)	√	√		√				
Rungroueng and Monpanthong (2021)	√	√	√	√	√			
Rungroueng (2023b)	√	√	√	√	√			
Rungroueng (2023a)	√	√	√	√	√			
Rungroueng and Monpanthong (2023)	√	√	√	√	√			
Total	**14**	**19**	**7**	**10**	**15**			

Table 2 Summary of the Latent Constructs and Observed Variables of Perceived Port Quality

Latent Construct (Second-order factor)	Observed Variables (First-order factor)	Element	Authors
Perceived Port Quality (PPQ)	Cruise Terminal Facilities	1. Restroom/toilet 2. Information signage display 3. Passengers embarkation/disembarkation counter 4. Supplementary facilities (library, computer room, educational classes, conference) 5. Tourist information service desk 6. Free Wi-Fi service 7. Restaurant/cafeteria/café 8. Exchange money service 9. Souvenir shop/duty free 10. First aid station 11. Tour and travel agencies service desk 12. Car parking 13. Taxi counter	Adapted from (Cardenas-Garcia et al., 2016; B. L. Chua et al., 2015; B. L. Chua et al., 2017; Lyu et al., 2017; Muskat et al., 2019; Sanz-Blas, Carvajal-Trujillo, et al., 2017; Satta et al., 2015; Tao & Kim, 2019; Whyte, 2017; Wu et al., 2018)
	Port Service Encounter Performance	1. Courteous and polite employees 2. Make passengers feel safe 3. Always willing to help passengers 4. Responsive to passengers' needs 5. Carry out passengers' requests without error 6. Dependable service 7. Understanding of passengers' specific needs 8. Timeliness of service 9. Immigration formality	Adapted from (B. L. Chua et al., 2015; B. L. Chua et al., 2017; Forgas-Coll et al., 2015; Jiang, 2019; Kwortnik, 2008; Lee et al., 2017; Lyu et al., 2017; Ma et al., 2018; Muskat et al., 2019; Mustelier-Puig et al., 2018; Sanz-Blas, Carvajal-Trujillo, et al., 2017; Satta et al., 2015; Shahijan et al., 2018; Tao & Kim, 2019; Wu et al., 2018)
	Port Location	1. Near the cruise itineraries 2. Near the city center 3. Close to the tourism attractions	Adapted from (Ma et al., 2018; Whyte, 2017; Wu et al., 2018)
	Ground Transportation of Port	1. Easy accessibility to attractions and supporting services 2. Availability of a nearby international airport 3. Reliable land transport 4. Passenger traffic volume of road and train	Adapted from (Cardenas-Garcia et al., 2016; Ma et al., 2018; Satta et al., 2015; Tao & Kim, 2019; Whyte, 2017; Wu et al., 2018)
	Port Physical Environment Quality	1. Cleanliness 2. Room temperature 3. Lighting 4. Interior and exterior décor 5. Layout 6. Safety	Adapted from (Cardenas-Garcia et al., 2016; B. L. Chua et al., 2015; B. L. Chua et al., 2017; Kwortnik, 2008; Lee et al., 2017; Lyu et al., 2017; Muskat et al., 2019; Sanz-Blas, Carvajal-Trujillo, et al., 2017; Satta et al., 2015; Whyte, 2017; Wu et al., 2018)

it is found that the measurement construct of these components is commonly used in the second-order and first-order model. Therefore, this model was adapted to this research.

Table 2 summarizes the characteristics of the latent construct, perceived port quality, which consists of 5 observed variables as follows:

(1) Cruise Terminal Facilities
(2) Port Service Encounter Performance
(3) Port Location
(4) Ground Transportation of Port
(5) Port Physical Environment Quality

The model consists of indicators for each of the sub-components through the second-order constructs and first-order constructs to test the study results according to the research objectives, which can determine the 10-research hypothesis (the research hypothesis 1-5 are in the formative form, while the research hypothesis 6-10 are in the reflective form) as follows:

H1: Cruise Terminal Facilities (PPQ1) have a positive influence on Perceived Port Quality (PPQ)

H2: Port Service Encounter Performance (PPQ2) has a positive influence on Perceived Port Quality (PPQ)

H3: Port Location (PPQ3) has a positive influence on Perceived Port Quality (PPQ)

H4: Ground Transportation of the Port (PPQ4) has a positive influence on Perceived Port Quality (PPQ)

H5: Port Physical Environment Quality (PPQ5) has a positive influence on Perceived Port Quality (PPQ)

H6: Perceived Port Quality (PPQ) has a positive influence on Cruise Terminal Facilities (PPQ1)

H7: Perceived Port Quality (PPQ) has a positive influence on Port Service Encounter Performance (PPQ2)

H8: Perceived Port Quality (PPQ) has a positive influence on Port Location (PPQ3)

H9: Perceived Port Quality (PPQ) has a positive influence on Ground Transportation of the Port (PPQ4)

H10: Perceived Port Quality (PPQ) has a positive influence on Port Physical Environment Quality (PPQ5)

3. RESEARCH METHODOLOGY

Population and Sample

An infinite population could be determined from a yearly report from CILA (CLIA, 2014, 2016, 2017, 2018a, 2019b) which gives information about destinations in Thailand. Laem Chabang port, Phuket port, and Samui port are the top 3 ports for docking. When comparing Laem Chabang port to the selected research criteria, it becomes clear that this is the only port which has all of the essential port infrastructure, including the terminal and the only port where cruise ships may dock directly at the port. Therefore, the population used in the study is Thai (who can communicate in English) and foreign cruise passengers who travel or traveled with cruise and embarkation at Laem Chabang port and travelled in Thailand both overnight and transit or turnaround.

To define the sample size with the infinite population used in this research, focusing on defining sampling size will lead to static possible study results (Baggio, 2011). Sampling size for equation analysis should be at least 100-200 or more according to Hoyle (1995) and Kline (2016). When considering the equation of Cohen quoted in Cunningham & McCrum-Gardner (2007), and Faul, Edgar, Buchner & Lang (2009) through the G*power program with Linear Multiple Regression: Fixed model, R2 deviation from zero that clarified 3 levels of effect size (Cohen, 1988) defined the α error probability and power of 1-β error probability as 0.5 and 0.95. The analysis result from the program is 178 samples (Wiratchai, 2012) which match Barclay, Thompson, and Higgins (1995); Gefen, Straub, and Boudreau (2000); Hair, Ringle, and Sarstedt (2011); Hair, Hult, Ringle and Sarstedt (2013); Hoyle (1995); Kline (2016); and Marcoulides and Saunders (2006). Data were received from 305 respondents, such that the sample size was greater than the determined minimum amount, from all calculation methods. With an infinite population, the sampling method chosen in this study was based on non – probability

sampling with a convenience or accidental sampling technique (Sangpikul, 2013).

Survey Instrument

Based on the objectives, the research instrument used in this quantitative research was a questionnaire. The questionnaire was created from a review of the relevant concepts, theories, and research, as follows: evaluating Thailand's cruise tourism potential and perceived port quality. Perceived Port Quality (PPQ) has been conceived as both a first-order multidimensional construct and as a second-order construct. The PPQ of the visitors was operationalized as a higher order construct adapted from a validated scale form. The PPQ scale comprises five latent factors: (1) cruise terminal facilities, adapted from Cardenas-Garcia et al. (2016); Chua et al. (2015); Chua et al. (2017); Lyu et al. (2017); Muskat et al. (2019); Sanz-Blas, Carvajal-Trujillo, et al. (2017); Satta et al. (2015); Tao & Kim (2019); Whyte (2017); and Wu et al. (2018); (2) port service encounter performance, adapted from Chua et al. (2015); Chua et al. (2017); Forgas-Coll et al. (2015); Jiang (2019); Kwortnik (2008); Lee et al. (2017); Lyu et al. (2017); Ma et al. (2018); Muskat et al. (2019); Mustelier-Puig et al. (2018); Sanz-Blas, Carvajal-Trujillo, et al. (2017); Satta et al. (2015); Shahijan et al. (2018); Tao & Kim (2019); and Wu et al. (2018); (3) port location, adapted from Ma et al. (2018); Whyte (2017); and Wu et al. (2018), (4) ground transportation of the port, adapted from Cardenas-Garcia et al. (2016); Ma et al. (2018); Satta et al. (2015); Tao & Kim (2019); Whyte (2017); Wu et al. (2018), and (5) port physical environment quality, adapted from

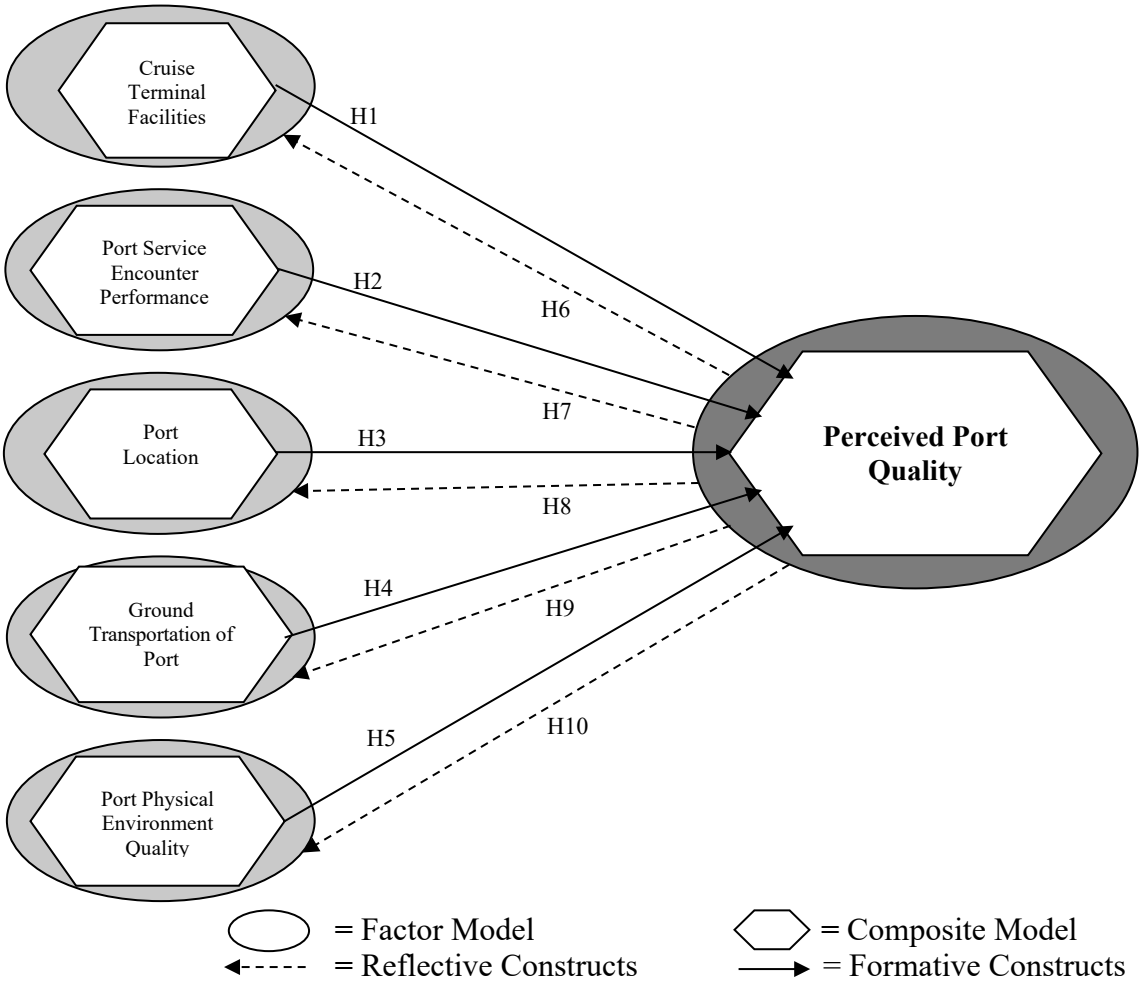

Figure 1 Conceptual Research Framework

Cardenas-Garcia et al. (2016); Chua, Lee, & Han (2017); Chua et al. (2015); Chua et al.(2017); Kwortnik (2008); Lyu et al. (2017); Muskat et al. (2019); Sanz-Blas, Carvajal-Trujillo, et al. (2017); Satta et al. (2015); Whyte (2017); Wu et al. (2018). The five factors (dimensions) were measured using 36 attribute items (observed variables) though a close-ended questionnaire, with each question using an 8-point Likert scale.

Data Analysis

This study applied the Generalized Structured Component Analysis (GSCA) to evaluate the model (Hwang & Takane, 2004); GSCA Pro 1.1.6 software was used for the analysis of the structural equation model (Hwang et al., 2021). Recently, this technique has gained more traction from tourism and hospitality researchers (Manosuthi, Lee, & Han, 2022a, 2022b) since it is an unbiased estimator compared to other comparable methods when the model contains factors and components (Hwang et al., 2021; Manosuthi, Lee, & Han, 2021a, 2021b). The construct validity was examined through convergent validity where each criterion should have afactor loading > 0.7 (Joe F Hair Jr, Howard, & Nitzl, 2020) and an average variance extracted (AVE) > 0.5 (Fornell & Larcker, 1981), as well as discriminant validity, which can be determined via the Heterotrait-Monotrait ratio of correlations (HTMT) being <0.85 (Chumwichan, Wongwanich, & Pirom-sombat, 2023; Henseler, Ringle, & Sarstedt, 2015). The model fit indices were also examined, such that each criterion had a standardized root mean square residual (SRMR) < 0.08 (Joe F Hair Jr et al., 2020), while the statistical significance was also examined and influenced path size using Bootstrap with a confidence level of 95%.

4. RESULTS

Demographic Characteristics of the Sample

Most respondents were female (143 or 46.9%), while 140 were male (45.9%) 11 were LGBTQ+ (3.6%) and 11 were N/A

Table 3 The Analysis Results of Demographic Data

Characteristic	Number	Percent
Gender		
Male	140	45.9
Female	143	46.9
LGBTQ+ (Alternative gender)	11	3.6
N/A	11	3.6
Total	305	100
Age		
18-40 (Generation Z and Y)	274	89.9
41-55 (Generation X)	26	8.5
56-74 (Baby Boomer)	5	1.6
Total	305	100
Nationality (Regional)		
Europe	2	0.7
Asia	300	98.4
Africa	1	0.3
North America	1	0.3
South America	1	0.3
Total	305	100

(3.6%). The age group of 18-40 years old accounted for the most respondents, totaling 274 (89.9%). The nationality (region) of most respondents was Asia, accounting for 300 respondents (98.4%) (See Table 3).

Results of the Analysis of Construct Validity

Internal consistency was assessed using Dillon-Goldstein's Rho, with the criterion of having a value greater than 0.7 indicating high reliability, as recommended by Hwang and Takane (2014). Results showed that all variables within the structure were highly consistent, with Rho values ranging from 0.935 to 0.969, (PPQ1 = 0.963, PPQ2 = 0.969, PPQ3 = 0.935, PPQ4 = 0.942, PPQ5 = 0.968). Convergent validity was assessed by calculating the Average Variance Extracted (AVE) with a recommended threshold of 0.5, as suggested by Manosuthi et al. (2021a, 2021b). The results indicated that the instrument used in this study had good convergent validity, with AVE values ranging from 0.666 to 0.828, (PPQ1 = 0.666, PPQ2 = 0.774, PPQ3 = 0.828, PPQ4 = 0.801, PPQ5 = 0.811). Construct validity was assessed through factor analysis, which grouped similar questions into the same variable. The criterion for factor loading was set at 0.7 or greater, as recommended by Hair Jr et al. (2020). Results showed that all factors were highly related, with factor loading values greater than 0.7. The goodness of fit of the structural model was evaluated using the Goodness of Fit Index (GFI) and Standardized Root Mean Square Residual (SRMR), with recommended criteria of 0.9 and 0.08, respectively, as suggested by Hu and Bentler (1999). Results indicated that the GFI was 0.996 and the SRMR was 0.037, suggesting a good model fit. Discriminant validity was assessed using the Heterotrait-Monotrait ratio of correlations (HTMT) with a recommended threshold of less than 0.85, as suggested by Henseler et al. (2015). Results showed that all variables had HTMT values less than 0.85, ranging from 0.657 to 0.859, (PPQ1 ↔ PPQ2 = 0.676, PPQ1 ↔ PPQ3 = 0.684, PPQ1 ↔ PPQ4 = 0.739, PPQ1 ↔ PPQ5 = 0.759, PPQ2 ↔ PPQ3 = 0.661, PPQ2 ↔ PPQ4 = 0.657, PPQ2 ↔ PPQ5 = 0.72, PPQ3 ↔ PPQ4 = 0.859, PPQ3 ↔ PPQ5 = 0.718, PPQ4 ↔ PPQ5 = 0.815) and thus were deemed acceptable, indicating good discriminant validity. Following this examination, it was concluded that the measurement model had acceptable construct validity (Fornell & Larcker, 1981; Hair Jr et al., 2020; Henseler et al., 2015) as shown in Table 4.

Results of the Structural Analysis of the Model and Hypothesis Testing Results

The model had satisfactory fit indices. Overall, the model explained 75.6% of all variation as indicated by FIT = 0.756. In addition, the variation within the measurement models was explained by around 75% of their indicators (FITm = 0.75). Likewise, the model was structurally explained by 79.2% of all variables (FITs = 0.792). The analysis result for the model fit indices found that the standardized root mean square residual value (SRMR) was 0.037. The investigation has shown that the measurement model has a good model fit. The investigation of the structural path coefficients shown in Figure 2, shows that the results do not support rejection of the ten hypotheses. Additional investigation results found that cruise terminal facilities yielded values of β (Reflective) = 0.857, and β (Formative) = 0.229); port service encounter performance yielded values of β (Reflective) = 0.825, and β (Formative) = 0.22; port location yielded values of β (Reflective) = 0.856, and β (Formative) = 0.228; ground transportation of the port yielded values of β (Reflective) = 0.895, and β (Formative) = 0.238; and port physical environment quality yielded values of β (Reflective) = 0.895, and β (Formative) = 0.238.

Cruise terminal facilities (PPQ1) can predict 73.5% ($R^2 = 0.735$) of the variation in perceived port quality, whereas port service encounter performance (PPQ2) can predict

Table 4 The Analysis Results of Construct Validity

Item	Mean	SD	Loadings	Weights for 1st order compo-nents	Weights for 2nd order compo-nents	95% CI		AVE	CR
1st Order Components									
Perceived Port Quality									
Cruise Terminal Facilities									
1.Restroom/toilet	5.407	1.605	0.792	0.093		0.084	0.103		
2.Information signage display	5.866	1.402	0.804	0.089		0.078	0.101		
3.Passengers embarkation/disembarkation counter	5.761	1.51	0.823	0.097		0.084	0.109		
4.Supplementary facilities (e.g., library, computer room, educational classes, conference)	5.167	1.733	0.816	0.093		0.083	0.103		
5.Tourist information service desk	5.728	1.456	0.855	0.1		0.089	0.113	0.666	0.962
6.Free Wi-Fi service	4.961	1.851	0.742	0.091		0.08	0.102		
7.Restaurant/cafeteria/café	5.433	1.622	0.809	0.093		0.082	0.106		
8.Money exchange service	5.416	1.554	0.817	0.087		0.076	0.098		
9.Souvenir shop/duty free	5.626	1.477	0.871	0.094		0.083	0.107		
10.First aid station	5.318	1.64	0.815	0.093		0.081	0.106		
11.Tour and travel agencies service desk	5.593	1.473	0.869	0.099		0.086	0.112		
12.Car/bus parking	5.672	1.548	0.798	0.089		0.077	0.1		
13.Taxi counter	5.82	1.452	0.79	0.106		0.095	0.119		
Port Service Encounter Performance									
14.Courteous and polite employees	5.918	1.431	0.878	0.1		0.087	0.114		
15.Making passengers feel safe	5.892	1.418	0.907	0.159		0.143	0.177		
16.Always willing to help passengers	5.993	1.453	0.923	0.142		0.126	0.158		
17.Responsive to passengers' needs	6.013	1.331	0.898	0.124		0.107	0.139	0.774	0.912
18.Carrying out passengers' requests without error	5.934	1.319	0.891	0.109		0.094	0.128		
19.Reliable service	6.095	1.375	0.904	0.127		0.112	0.144		
20.Understanding of passengers' specific needs	5.908	1.393	0.879	0.125		0.113	0.137		
21.Timeliness of service	6.144	1.411	0.83	0.117		0.107	0.129		
22.Immigration formality	5.889	1.403	0.806	0.131		0.119	0.142		
Port Location									
23.Connectivity between ports	5.8	1.452	0.901	0.39		0.358	0.421		
24.Near the city center	5.659	1.554	0.917	0.326		0.294	0.364	0.828	0.414
25.Close to tourism attractions	5.898	1.562	0.912	0.383		0.343	0.411		

Table 4 (Continued)

Item	Mean	SD	Loadings	Weights for 1st order compo-nents	Weights for 2nd order compo-nents	95% CI	AVE	CR	
Ground Transportation of the Port									
26.Easy accessibility to attractions and supporting services	5.685	1.517	0.904	0.289		0.262	0.317		
27.Availability of a nearby international airport (e.g., 100 kilometers from Laem Chabang port to international airport)	5.528	1.597	0.868	0.261		0.236	0.286	0.801	0.567
28.Reliable land transport	5.77	1.524	0.915	0.277		0.249	0.305		
29.Passenger traffic vol-ume of road and train	5.567	1.54	0.894	0.29		0.261	0.32		
Port Physical Environment Quality									
30.Quality of cleanliness	5.725	1.637	0.904	0.16		0.139	0.182		
31.Quality of room temperature	5.97	1.472	0.899	0.155		0.137	0.172		
32.Quality of lighting	6.026	1.453	0.903	0.159		0.14	0.176		
33.Quality of interior and exterior décor	5.521	1.718	0.863	0.162		0.145	0.179		
34.Quality of layout (e.g., floor plan, and so on)	5.777	1.563	0.928	0.163		0.145	0.185	0.811	0.844
35.Quality of safety (e.g., safety equipment, and so on)	5.938	1.446	0.906	0.17		0.154	0.187		
36.Quality of smell	5.767	1.451	0.9	0.142		0.121	0.161		
2nd Order Components									
Perceived Port Quality									
1.Cruise terminal facilities (PPQ1)					0.229	0.217	0.241		
2.Port service encounter performance (PPQ2)					0.22	0.207	0.231		
3.Port location (PPQ3)					0.228	0.218	0.241		
4.Ground transportation of the port (PPQ4)					0.238	0.227	0.253		
5.Port physical environment quality (PPQ5)					0.238	0.227	0.252		

68.1% (R^2 = 0.681) of the variation in perceived port quality, and port location (PPQ3) can predict 73.3% (R^2 = 0.733) of the variation in perceived port quality. In addition, ground transportation of the port (PPQ4) can predict 80.1% (R^2 = 0.801) of the variation in perceived port quality. Likewise, port physical environment quality (PPQ5) can predict 80.1% (R^2 = 0.801) of the variation in perceived port quality.

Path Coefficients

Table 5 and Figure 2 present the results of the path coefficients and confidence intervals at 95% of the structural equation model. The research findings indicate that the path coefficients are statistically significant for the path model relationships.

Cruise terminal facilities (PPQ1) has a positive influence on perceived port quality

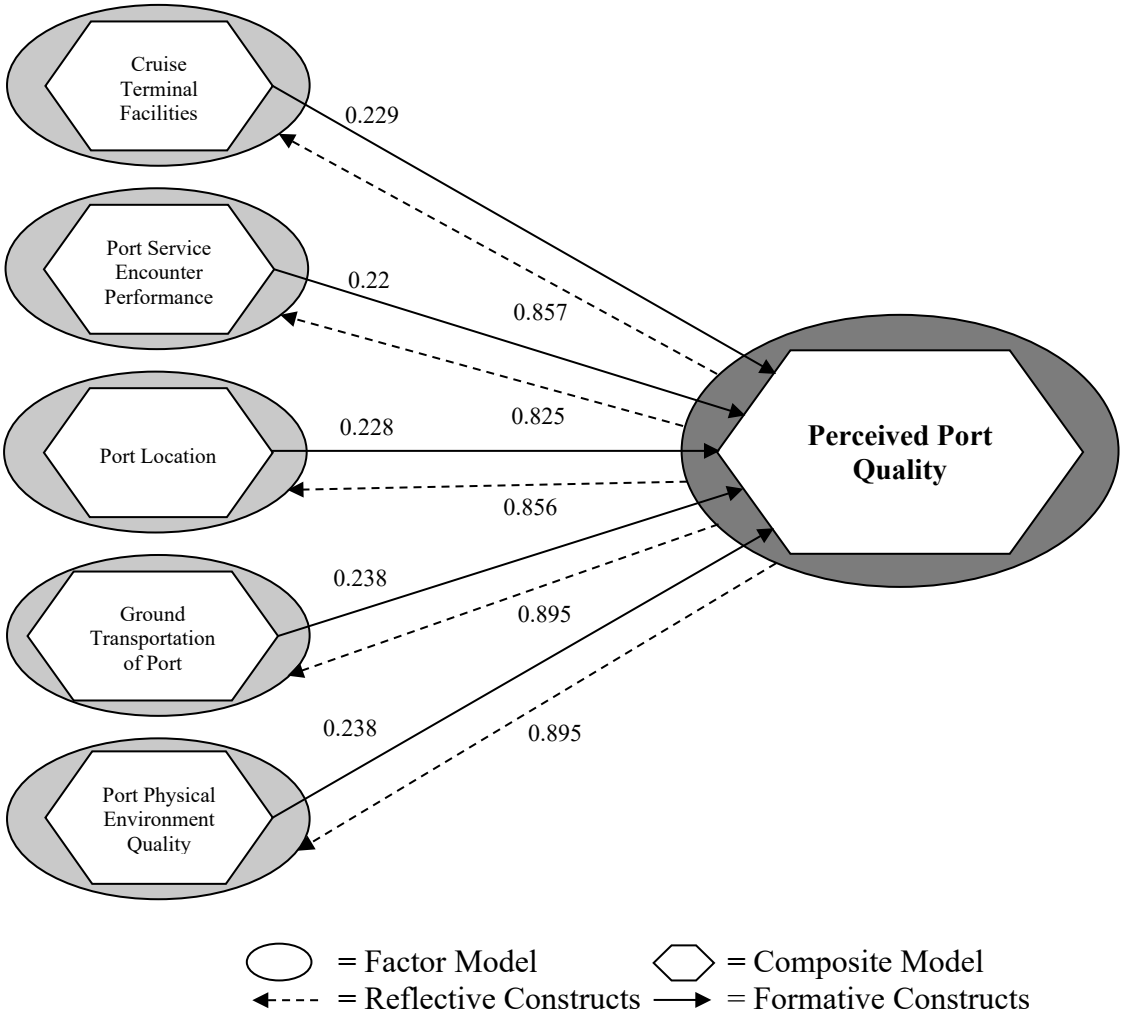

Figure 2 The Results of Hypothesis Testing Using GSCA

Table 5 The Results of Hypothesis Testing Based on GSCA

		Estimate	SE	95%CI		Results
H1	PPQ1→PPQ	0.229	0.006	0.217	0.241	Supported
H2	PPQ2→PPQ	0.22	0.006	0.207	0.231	Supported
H3	PPQ3→PPQ	0.228	0.006	0.218	0.241	Supported
H4	PPQ4→PPQ	0.238	0.007	0.227	0.253	Supported
H5	PPQ5→PPQ	0.238	0.007	0.227	0.252	Supported
H6	PPQ→PPQ1	0.857	0.025	0.802	0.9	Supported
H7	PPQ→PPQ2	0.825	0.036	0.748	0.885	Supported
H8	PPQ→PPQ3	0.856	0.022	0.81	0.895	Supported
H9	PPQ→PPQ4	0.895	0.016	0.863	0.923	Supported
H10	PPQ→PPQ5	0.895	0.016	0.86	0.923	Supported

(PPQ) (β (Formative) = 0.229, 95% CI = 0.217 - 0.241, SE = 0.006); in the same way, perceived port quality (PPQ) has a positive influence on cruise terminal facilities (PPQ1) (β (Reflective) = 0.857, 95% CI = 0.802 - 0.9, SE = 0.025), both supporting hypothesis 1 (H1) and hypothesis 6 (H6).

In addition, port service encounter performance (PPQ2) has a positive influence on perceived port quality (PPQ) (β (Formative) = 0.22, 95% CI = 0.207 - 0.231, SE = 0.006); in the same way, perceived port quality (PPQ) has a positive influence on port service encounter performance (PPQ2) (β (Reflective) = 0.825, 95% CI = 0.748 - 0.885, SE = 0.036), both supporting hypothesis 2 (H2) and hypothesis 7 (H7).

Additionally, port location (PPQ3) has a positive influence on perceived port quality (PPQ) (β (Formative) = 0.228, 95% CI = 0.218 - 0.241, SE = 0.006); in the same way, perceived port quality (PPQ) has a positive influence on port location (PPQ3) (β (Reflective) = 0.856, 95% CI = 0.81 - 0.895, SE = 0.022), both supporting hypothesis 3 (H3) and hypothesis 8 (H8).

Moreover, ground transportation of the port (PPQ4) has a positive influence on perceived port quality (PPQ) (β (Formative) = 0.238, 95% CI = 0.227 - 0.253, SE = 0.007); in the same way, perceived port quality (PPQ) has a positive influence on ground transportation of the port (PPQ4) (β (Reflective) = 0.895, 95% CI = 0.863 - 0.923, SE = 0.016), both supporting hypothesis 4 (H4) and hypothesis 9 (H9).

Furthermore, port physical environment quality (PPQ5) has a positive influence on perceived port quality (PPQ) (β (Formative) = 0.238, 95% CI = 0.227 - 0.252, SE = 0.007); in the same way, perceived port quality (PPQ) has a positive influence on port physical environment quality (PPQ5) (β (Reflective) = 0.895, 95% CI = 0.86 - 0.923, SE = 0.016), both supporting hypothesis 9 (H9) and hypothesis 10 (H10).

5. DISCUSSION

The purpose of this study was to examine the confirmatory components of the factors in reflective and formative terms in order to develop a set of perceived port quality (PPQ) variables that represent the relationships between influencing variables, which can be useful for future studies and reference.

In accordance to the study's findings and the literature evaluation, perceived port quality (PPQ) is constructed from the following five significant component parts: cruise terminal facilities, port service encounter performance, port location, ground transportation of the port, and port physical environment quality. This finding is consistent with previous research by Ma et al. (2018), which highlighted the need of evaluating cruise homeport site choices, It comprises 7 components, 5 of which are present in this study. It brought attention to the consideration of the confirmatory components of cruise passenger perception, which are comparable to those used in this study. The results of the study of the impact of cruise port destination components on customer perception and satisfaction are supported by this conclusion, which is consistent with research by Satta et al. (2015). This discovery contributes to the industry's ability to respond to consumer demands.

Similarly, Tao and Kim's (2019) study applied the results of the research to reveal the characteristics of important factors that make cruise ship travelers' experiences memorable, in line with this study. Additionally, this is in line with research conducted by Wu et al. (2018) and Sanz-Blas, Buzova, and Carvajal-Trujillo (2017), who identified the characteristics of experiencing quality as regarded by cruise visitors. This study aids the cruise industry in providing high-quality experiences, improving cruise visitors' experiential satisfaction, and fostering positive future behavioral intentions.

Furthermore, the research study of factors demonstrates the components of the PPQ in the research which affect visitors' perceptions and is supported by of Whyte (2017) regarding onshore destination characteristics, which create motivating push and pull forces for cruise travel. As a consequence, by evaluating both reflective and formative models,

Table 6 Component Correlation Matrix

	PPQ1	PPQ2	PPQ3	PPQ4	PPQ5	PPQ
PPQ1	1.0	0.653	0.636	0.694	0.73	0.857
PPQ2	0.653	1.0	0.621	0.621	0.696	0.825
PPQ3	0.636	0.621	1.0	0.78	0.671	0.856
PPQ4	0.694	0.621	0.78	1.0	0.767	0.895
PPQ5	0.73	0.696	0.671	0.767	1.0	0.895
PPQ	0.857	0.825	0.856	0.895	0.895	1.0

this study was able to pinpoint linkages and validate the five PPQ components, leading to the approval of all ten hypotheses.

In addition, when considering each element separately, it was discovered that cruise terminal facilities had components from 13 items, consisting of 1) Restroom/toilet; 2) Information signage display; 3) Passengers embarkation/disembarkation counter; 4) Supplementary facilities (e.g., library, computer room, educational classes, conference); 5) Tourist information service desk 6) Free Wi-Fi service; 7) Restaurant/cafeteria/café; 8) Money exchange service; 9) Souvenir shop/ duty free; 10) First aid station; 11) Tour and travel agencies service desk; 12) Car/bus parking; and 13) Taxi counter (Cardenas-Garcia et al., 2016; B. L. Chua et al., 2015; B. L. Chua et al., 2017; Lyu et al., 2017; Muskat et al., 2019; Sanz-Blas, Carvajal-Trujillo, et al., 2017; Satta et al., 2015; Tao & Kim, 2019; Whyte, 2017; Wu et al., 2018).

Port service encounter performance was formed from 9 items including 1) Courteous and polite employees; 2) Making passengers feel safe; 3) Always willing to help passengers; 4) Responsive to passengers' needs; 5) Carrying out passengers' requests without error; 6) Reliable service; 7) Understanding of passengers' specific needs; 8) Timeliness of service; and 9) Immigration formality (B. L. Chua et al., 2015; B. L. Chua et al., 2017; Forgas-Coll et al., 2015; Jiang, 2019; Kwortnik, 2008; Lee et al., 2017; Lyu et al., 2017; Ma et al., 2018; Muskat et al., 2019; Mustelier-Puig et al., 2018; Sanz-Blas, Carvajal-Trujillo, et al., 2017; Satta et al., 2015; Shahijan et al., 2018; Tao & Kim, 2019; Wu et al., 2018).

Meanwhile, port location comprised of 3 items, 1) Connectivity between port; 2) Near the city center; and 3) Close to the tourism attractions (Ma et al., 2018; Whyte, 2017; Wu et al., 2018).

In addition, ground transportation of the port was made up of 4 items, 1) Easy accessibility to attractions and supporting services; 2) Availability of a nearby international airport (e.g., 100 kilometers from Laem Chabang port to international airport); 3) Reliable land transport; and 4) Passenger traffic volume of road and train (Cardenas-Garcia et al., 2016; Ma et al., 2018; Satta et al., 2015; Tao & Kim, 2019; Whyte, 2017; Wu et al., 2018).

Furthermore, port physical environment quality was set to include 7 items, consisting of 1) Quality of cleanliness; 2) Quality of room temperature; 3) Quality of lighting; 4) Quality of interior and exterior décor; 5) Quality of layout (e.g., floor plan, and so on); 6) Quality of safety (e.g., safety equipment, and so on); and 7) Quality of smell (Cardenas-Garcia et al., 2016; B. L. Chua et al., 2015; B. L. Chua et al., 2017; Kwortnik, 2008; Lee et al., 2017; Lyu et al., 2017; Muskat et al., 2019; Sanz-Blas, Carvajal-Trujillo, et al., 2017; Satta et al., 2015; Whyte, 2017; Wu et al., 2018).

Therefore, through the 36 observed variables used in this test and research, it was feasible to corroborate the components of the Perceived Port Quality (PPQ) latent construct. Additionally, these components may be categorized into 5 latent construct categories as first-order constructs consisting of cruise terminal facilities, port service encounter performance, port location, ground transportation of

the port, and port physical environment quality, which include significant reflective and formative constructs that were representative of the Perceived Port Quality (PPQ).

6. CONCLUSION

Theoretical Implications

Through the perspectives of cruise visitors, this study reaffirms the elements that make up the qualities of an excellent port. The study incorporated the same factors that have previously been explored (Ma et al., 2018; Sanz-Blas, Carvajal-Trujillo, et al., 2017; Satta et al., 2015; Tao & Kim, 2019; Whyte, 2017; Wu et al., 2018) and lead to the identification of new variables as a result of the research investigation. This research is therefore useful for confirming and completing the gaps left by earlier investigations, producing a more conceptually comprehensive understanding. Meanwhile, academics may employ these sets of variables in examination together with other factors in future research.

Furthermore, it is critical to maintain the theoretical applications current and engaging by upgrading the variables to be more thorough and reflective. Data analytic tools can do the same, the GSCA program may be used to simultaneously identify influences, paths, and relationships in both reflective and formative terms at the same time. As a result, the error value might be decreased. This concept and model have the potential to grow and evolve in the future on this paradigm.

Managerial Implications

Based on the study of the aspects used in this research, managers can become aware of the significant factors that cruise visitors take into consideration while choosing a cruise port. In order to efficiently and successfully create and design services for visitors in this category, executives and tourism managers of cruise ships and ports will be able to use the knowledge that has been discovered. Additionally, the research included a study of visitor views and service touchpoints. The results of the study can be used as guidelines for designing policies to develop cruise tourism in the port area as well.

The study's findings may also be used to assess the importance required for the development of Thailand's cruise ports and serve as a model for other countries that are cruise destinations in terms of whether aspects should be developed first or last in order to maximize benefits while keeping costs to a minimum.

Limitations and Future Research

This study's primary emphasis was on respondents in the Generation Z and Y (18–40) age range who use cruise destinations in Thailand. As a result, it is advised that future studies focus on a sample of people who are older than 40 or who use ports across various nations. This will make it possible to examine and contrast consumer actions in relation to port services for cruise ships from a demographic and geographic perspective, making sure that no specific age group is overrepresented in the findings.

In addition, this study used a quantitative survey approach to gather data. It is advised that in order to augment and enhance the research findings, qualitative data gathering techniques should also be used in future investigations. For instance, one may explore the data utilizing both quantitative and qualitative research, or mixed methodologies research (Rungroueng & Charoenbut, 2019), by employing an EDFR (Ethnographic Delphi Futures Research) qualitative analysis (Rungroueng, 2016; Rungroueng, Chanthothai, & Namzuy, 2016). Further investigation into the relationship between perceived cruise destination quality and customer satisfaction, as well as other relevant issues, can aid in the creation of successful and appropriate service practices.

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