Influence of cultural intelligence and personal beliefs on the usage continuance intention of travel mobile applications

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Abstract

This study analyzes the influence of cultural intelligence (CQ) and personal beliefs on tourists' intention to continue using travel mobile applications (TMA) in Can Tho City, based on survey data from 212 tourists. The results confirm the importance of CQ and personal beliefs in shaping tourists' satisfaction with TMA. Specifically, the findings indicate that higher satisfaction with a travel mobile application leads to a greater intention to continue using it. Furthermore, this study reveals that metacognitive CQ, cognitive CQ, and motivational CQ positively influence satisfaction with TMA. Personal beliefs are also found to have a positive impact on satisfaction with mobile travel applications. These insights highlight the key role of CQ and personal beliefs for travel businesses and agencies in enhancing tourist satisfaction and increasing the likelihood of continued usage of TMA.

Keywords: Continuance intention, cultural intelligence, personal beliefs, PLS-SEM, travel mobile apps

JEL Classification Codes: M10, M15, Z30, Z32

1. Introduction

The tourism industry plays an important role in the economy of Vietnam. Every year, this industry creates millions of jobs, helps reducing unemployment, contributes to economic development and promotes the image of Vietnam to the world. According to data from the Vietnam National Administration of Tourism, the number of international tourists coming to Vietnam in 2022 is estimated to reach 3.5 million and the total number of domestic tourists is estimated to reach over 101.3 million.

In the tourism sector, the emergence of mobile technology has promoted travel and changed tourist behavior (Wang et al., 2016). The use of smartphones and apps has affected daily life and has also had a significant impact on the tourism industry due to the profound impact these technologies have on individual behavior (Gupta et al., 2018). Smartphone travel apps are apps specifically targeted at tourists as well as those used in typical travel contexts (Lu et al., 2015). Additionally, travel apps have a profound influence on tourist behavior throughout the entire travel experience (Coves-Martínez et al., 2023). However, they also pose a challenge because they affect tourist satisfaction and have changed almost every aspect of travel behavior (Wang et al., 2012). Coves-Martínez et al. (2022) argue that applications are now an integral part of the tourist experience. When researching applications, it is necessary to focus on analyzing the intention to continue using because it shows the user's attachment to the application. Nearly 40% of users who downloaded an app abandoned it immediately after one use after download (Coves-Martínez et al., 2023).

Although there are many studies on mobile application adoption, the number of studies on the intention to continue using TMA is limited. Studies in other fields on continuance intention to use apps are more common, such as taxi booking apps by Weng et al. (2017), electronic car booking applications by Joia and Altieri (2018) or online food ordering application by Alalwan (2020). These are applications that users tend to use in their daily lives or relatively frequently. However, travel apps differ in features, functions, and design, which may have different effects on user experience and satisfaction (Wang et al., 2016). Therefore, the factors influencing continuance intention for travel apps may differ from studies in other contexts.

Furthermore, like all other technologies, application adoption and usage are influenced by the user's culture (Hoehle et al., 2015). Cultural differences can create barriers to technology adoption and influence all aspects of individual behavior (Coves-Martínez et al., 2022; Erumban & De Jong, 2006). Most mobile applications are adapted to worldwide usage, so developing applications that satisfy individuals from different cultural backgrounds is a significant challenge (Hoehle et al., 2015). Therefore, businesses need to pay attention to why individuals can adapt better to cultures different from their own. In that context, cultural intelligence (CQ) is a person's ability to adapt well to a new cultural environment. People with high CQ know how to observe, empathize, use intelligence to understand people and situations, draw inferences and take cognitive and emotional actions to deal with cultural differences (Earley & Ang, 2003). Individuals' cultural intelligence can be the foundation for their adaptation to technology applications, thereby increasing satisfaction with them. Nevertheless, to date, there has been little research linking cultural intelligence to technology. Most studies to date have focused on analyzing the influence of cultural intelligence in the field of cross-cultural communication (Coves-Martínez et al., 2018). There are only two academic studies addressing this relationship including the first study linking CQ to intention to use the internet (Coves-Martínez et al., 2018) and the study of CQ in the relationship with satisfaction with travel apps and travel experiences (Coves-Martínez et al., 2022).

Although TMA have had certain successes when introduced in Vietnam, there are very few studies focusing on the context of intention to continue using travel mobile applications, except for the study of Tran and Le (2022) on the intention to continue using travel apps of online travel agencies. Therefore, more research is needed on tourism mobile applications. Along with that, cultural intelligence is an extremely important issue in tourism. There are cultural differences between service providers and customers. However, the research on cultural intelligence in the field of tourism, especially technology in tourism in Vietnam has still been scared.

According to data from data.ai, in Vietnam, every minute more than 6,000 applications were downloaded and more than $900 was spent, which contributed to the growth of year 2022 reaching 22% over the same period previous year. In particular, the users in Vietnam spent an average of 4 hours a day on the application. The significant number of mobile connections in Vietnam provides the opportunity for a large and potential market in the

tourism sector, while also posing challenges in competition and management of multiple connections.

Can Tho City, located in the center of the Mekong Delta, has rich natural conditions with fertile land and an intricate canal system that is very convenient for tourism development. In 2022, the total number of visitors to Can Tho city reached more than 5.1 million. Total tourism revenue was estimated to reach 4,117 billion VND (Can Tho City Tourism Development Center, 2023). This shows that tourism is one of the economic sectors that greatly contributes to the total economy of Can Tho city and increasingly occupies an important position in the economy of the city. In addition, the Vietnamese tend to use a lot of online travel agency platforms such as Traveloka or Booking.com. However, the number of tourists using TMA in general and travel mobile applications of online travel agencies in particular in Vietnam is much lower than in other countries. Thus, it is necessary to better understand tourists' behavior toward travel mobile applications in Vietnam. The research results are expected to be the basis for travel businesses and agencies to consult and promulgate policies to increase tourists' intention to continue using tourism mobile applications.

2. Literature Review and Proposed Research Model

2.1 Cultural intelligence

The concept of CQ was introduced into the social sciences and management in 2003 (Earley & Ang, 2003). CQ is measured as Cultural Quotient or CQ. CQ is the set of skills and qualities required to interact effectively with people in diverse cultural contexts (Arora & Rohmetra, 2010; Earley & Ang, 2003). Theoretically, CQ differs from personality traits because personality traits are characteristics that describe a person's general and enduring behavioral tendencies across situations, while CQ refers to the ability to flexibly determine what a person can do to be effective in a multicultural environment (Ang & Van Dyne, 2015). The emerging concept of (CQ) supports to enhance our understanding and interpretation of variations in effectiveness across diverse cultural settings (Bücker et al., 2015). Thanks to the concept of CQ, we can better understand why some individuals adapt more effectively to distinct cultural environments than others. According to Brislin et al. (2006), CQ has many different meanings that can

be considered complementary to each other. On the one hand, CQ refers to behaviors considered intelligent from the perspective of people in particular cultures. Such behaviors can include quickly applying pre-existing cultural knowledge, building relationships with people from other cultures, and carefully considering alternative actions in multicultural settings. On the other hand, CQ also suggests that the characteristics and skills of people adapt quickly, with minimal stress, when they interact extensively in cultures other than their native culture.

Accordingly, high CQ helps individuals have a broader understanding of cross-cultural situations (Mohamed & Marta, 2019) and promotes individuals' ability to interact with people of different cultures (Kotsaga, 2015). People with high CQ are able to communicate more effectively with people from other cultures. They do this easily because they understand the similarities and differences between cultures. (Ang & Van Dyne, 2015).

Earley and Ang (2003) points out that CQ is a multidimensional concept that includes metacognition, cognition, motivation, and behavior. Ang and Van Dyne (2015) also suggested that CQ is measured by four components, namely (1) Metacognitive CQ, (2) Cognitive CQ, (3) Motivational CQ and (4) Behavioral CQ.

Metacognitive CQ: This term refers to an individual's level of conscious cultural awareness during cross-cultural interactions. People with high metacognitive CQ often actively question their own cultural assumptions. Additionally, during interactions, people with high metacognitive CQ reflect on their interactions and adjust their cultural knowledge when interacting with people from other cultures. Metacognitive CQ involves higher-level thinking strategies that help individuals develop new ways and rules for interacting socially in different cultural contexts. This is accomplished by promoting in-depth information processing. People with high metacognitive CQ are often proactively aware of different cultural norms and preferences before and during interactions (Ang & Van Dyne, 2015).

Cognitive CQ: Cognitive CQ refers to an individual's level of cultural understanding or knowledge of the cultural environment acquired from education and personal experience. Such knowledge includes economic and legal systems, religious beliefs, marriage systems, arts and crafts, languages, and knowledge of the basic framework of cultural

values (Hofstede, 2001). When individuals have knowledge about a society's culture and its components, it helps the individual have a clearer picture of that society and facilitates specific interactions with other cultures. Therefore, people with high cognitive CQ are able to interact more effectively with people from other cultures(Ang & Van Dyne, 2015).

Motivational CQ: Motivational CQ reflects the ability to direct attention and energy toward learning and functioning in situations characterized by cultural differences. Motivational CQ is an important component of CQ because it is a source of motivation. It stimulates effort and energy toward functioning in novel cultural environments (Ang & Van Dyne, 2015).

Behavioral CQ: The final aspect reflects the ability to demonstrate appropriate verbal and nonverbal actions when interacting with people from different cultures. Behavioral CQ can be understood as an individual's capacity to exhibit appropriate verbal and nonverbal behaviors in diverse cultural contexts. This dimension of CQ is critical, as communication, both spoken and unspoken, is a primary component of social interaction. Therefore, individuals with high behavioral CQ are very flexible and can adjust their behavior to suit the specifics of each cultural interaction (Ang & Van Dyne, 2015).

2.2 Intention to Continue Using TMA

Continuity intention is a user's intention to continue using a technology system at a stage after initial adoption of use (Bhattacherjee, 2001). Coves-Martínez et al. (2023) stated that intention to continue using a travel mobile application is a traveler's intention to continue using a travel mobile application for travel-related purposes after initial acceptance of use.

Customer retention is the most important goal for companies that want to be successful and perhaps the most important concept in marketing. As a result, companies are focusing their efforts on retaining existing customers or getting them to repurchase, instead of focusing entirely on gaining new customers. Users' discontinuation of technology or perceived inefficiencies after initial adoption can have negative consequences for the business such as affecting profits (Bhattacherjee, 2001). Therefore, determining customers' intention to continue using a business's technology is an important deciding factor in bringing profits to the business. This is reflected in positive business results such

as reduced customer churn and price sensitivity, reduced marketing and new customer acquisition costs, while improving the company's reputation. These ultimately affected future profits directly or indirectly (Kim et al., 2015). Additionally, when exploring technology user intentions, continuance intention has been proposed as a key behavioral outcome at the post-technology adoption stage.

2.3 Tourist satisfaction

Tourist satisfaction is a topic that receives a lot of attention. The term tourist satisfaction in tourism research originates from customer satisfaction in the business (Y. Chen et al., 2013). Hansemark and Albinsson (2004) suggested that customer satisfaction is a customer's overall attitude toward a service provider, or an emotional response to differences between what the customer anticipated and what they experienced, with respect to the fulfillment of some need, goal or desire.

In the field of tourism, tourist satisfaction is the difference between the expected value and the perceived value that tourism products have on the emotional state of tourists (Yoon & Uysal, 2005). In addition, tourist satisfaction is also considered the level of satisfaction that tourists feel, derived from the customer's experience during the trip in meeting the wishes, expectations and needs of tourists related to the trip (C. Chen & Tsai, 2007). In the field of travel technology, satisfaction with travel applications is understood as consumers' perception of overall consumption when they use travel applications (Hsiao et al., 2016).

2.4 Proposed research model

The proposed research model is mainly based on the fundamental theoretical model of Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). Two main groups of factors including cultural intelligence and personal beliefs are expected to influence the intention to continue using travel applications through the premise of satisfaction (The research model is combined presenting with the results estimated by PLS-SEM in Figure 1).

Personal beliefs are inherited from Coves-Martínez et al. (2023). The contribution of this study is that the components of CQ are considered separately with four aspects including metacognitive CQ, cognitive CQ, motivational CQ and behavioral CQ. Examining each

of these components will help to further explore in this research field the type of CQ that needs attention and development for tourists, thereby enhancing their satisfaction and increasing their intention to continue using the travel app.

Joia and Altieri (2018) emphasized the need to integrate the Technology Acceptance Model (TAM) and its variants with satisfaction to explain technology acceptance more effectively. The UTAUT2 model is one of the variations of the TAM model. Wixom and Todd (2005) argue that there are two distinct theoretical streams applied in the study of information systems adoption. The first part concerns technology acceptance models, with an emphasis on TAM and its variations. The second theory, proposed by Bailey and Pearson (1983) and Ives et al. (1983), applies user satisfaction with information systems to explain similar adoption. These theoretical trends have contributed greatly to improved understanding of the success/failure of information systems use (Wixom & Todd, 2005). According to Liu et al. (2023), Coves-Martínez et al. (2023) and Alalwan (2020), user satisfaction is an important antecedent of mobile application continuance intention.

- *The influence of CQ on tourist satisfaction with travel applications:* Application satisfaction is a user's emotional response to technology after use (Ives et al., 1983). Stauss and Mang (1999) argued that one of the main issues related to cultural differences is that customer and supplier expectations may not be met, when supplier performance or behavior and customers differ from what is expected. Travel applications originate from many countries around the world. Each application is created to work in different countries around the world, thus cultural differences are inevitable. Coves-Martínez et al. (2018) that each culture is defined by norms, beliefs, and values that influence and complicate everyone’s thinking and actions. In the context of tourism, CQ minimizes this problem for both suppliers and tourists because it helps both parties adapt and resolve challenging issues that may arise across different cultures. Therefore, tourists with high CQ could be able to understand and act effectively in foreign environments and be in a better position to manage their expectations.

Coves-Martínez et al. (2022) show that CQ increases the use of travel applications during the travel experience and allows tourists to exploit the application to their fullest needs. This is because several specific characteristics are associated with CQ such as behavioral flexibility, motivation, performance, and the ability to adapt to unfamiliar cultural

environments (Ang & Van Dyne, 2015; Earley & Ang, 2003). CQ influences and enhances travel application characteristics such as productivity, efficiency, communication, and social interaction. CQ-related characteristics will also influence and enhance the utility of travel applications, for example in gathering information about destinations or finding new experiences. Coves-Martínez et al. (2022) stated that CQ could be able to improve the management skills and human skills of individuals on a global scale, which could have an impact on motivation, leadership, productivity, empowerment and satisfaction, among many other aspects.

In Vietnam, popular travel applications often originate from different countries around the world. Some popular online travel agencies in Vietnam include Traveloka, Agoda, Booking.com, Vietnam Booking, iVIVU, etc. This can create a cultural gap between users and the application. Tourism applications are created to serve both domestic and international tourists, so it is challenging to avoid cultural differences between regions and countries. Therefore, studying CQ in the context of tourism mobile applications is truly necessary.

Regarding the components of CQ, metacognitive CQ could enable individuals to perceive the cultural differences represented in applications, from which visitors could be able to form action strategies to achieve adaptation to those differences, while cognitive CQ pertains to knowledge about the general elements that make up other cultures, such as history, norms, or values (Ang & Van Dyne, 2015). Cognitive CQ refers to what tourists understand about other cultures, helping tourists understand the differences between other cultures. Besides, people with high motivational CQ could direct attention and energy to cross-cultural situations based on intrinsic concerns, concerns about using travel applications. In addition, behavioral CQ involves visitors' performing verbal or non-verbal behaviors to use the application. With good behavioral CQ, visitors can learn more deeply about the information on the application, helping visitors maximize the benefits that the application brings to customers. Coves-Martínez et al. (2022) also provided evidence that CQ has a great influence on satisfaction with travel applications. Therefore, a tool like the app that provides accurate, personalized and high-quality information about a destination will be very useful for individuals with high CQ who will exploit its full potential on the trip. Therefore, the following research hypothesis is proposed:

$H_{1.1}$: Metacognitive QQ has a positive influence on tourist satisfaction with TMA.

$H_{1.2}$: Cognitive CQ has a positive influence on tourist satisfaction with TMA.

$H_{1.3}$: Motivational CQ has a positive influence on tourist satisfaction with TMA.

$H_{1.4}$: Behavioral CQ has a positive influence on tourist satisfaction with TMA.

- *The influence of performance expectancy on tourist satisfaction with travel applications:* Performance expectancy is defined as the degree to which an individual believes that using the system will help the user achieve higher job performance (Venkatesh et al., 2003). In other words, it is the extent to which participants can complete tasks with the help of technology (Venkatesh et al., 2012). Customers use applications related to TMA, mobile features and flexibility provide convenience in interacting with travel service providers. By using a travel mobile app, customers can connect with any provider of accommodation, air tickets, transportation and other services at any time on any day. During the week, there are many options to consume, gather complete information and book services. At the same time, TMA also provide information about destinations, transportation methods, etc. to help users better understand the travel destination they are going to. Therefore, it can be argued that customers are more likely to be satisfied with TMA if they perceive high usefulness in using these applications. From a technological perspective, the use of travel apps can enrich the travel experience through practical applications for tourists, such as providing a travel database through the wireless internet infrastructure, creating favourable conditions for the application of mobile technology.

In the field of tourism, Liu et al. (2023) confirmed the relationship between tourists' expected effects on tourists' travel app satisfaction. This relationship between performance expectancy and tourist satisfaction has been documented by previous literature on mobile technology (Choi et al., 2019; Coves-Martínez et al., 2023; Joia & Altieri, 2018; Weng et al., 2017). Besides, most studies believe that expected performance is an important factor affecting satisfaction with applications. Users may be more satisfied with their experience with a travel mobile application if they feel that the application is more valuable and practical for their travel trip. Accordingly, the following hypothesis is proposed:

H_2: Performance expectancy has a positive influence on tourist satisfaction with TMA.

- *The influence of expected effort on tourist satisfaction with travel applications:* Expected effort is understood as the degree to which individuals perceive using a new technology as easy (Venkatesh et al., 2003). This construct parallels the perceived ease of use of the TAM model (Venkatesh et al., 2003). Accordingly, it can be suggested that as long as customers feel that it is easy to use, they will be satisfied with the experience of using a travel mobile application. In addition to usefulness and functionality, people also choose new technology because it is easier to learn and use (Kalinić et al., 2019).

In research on mobile applications, in the case of food delivery applications, the level of effort and energy shown by users can also indicate how easy or difficult it is to use the mobile application. From there, it can be inferred that customers enjoy using and feel satisfied with a certain application if they think the application is easier and less complicated (Lam et al., 2021; Ramos & Catalan, 2023). In the tourism sector, Coves-Martínez et al. (2023) argue that effort expectancy influences satisfaction among tourists from individualistic and uncertainty-avoiding cultures. However, for travellers from collectivist and uncertainty-avoiding cultures, such as the Spanish, if the technology is helpful to them during their trip, they will be satisfied with the technology no matter how difficult it is to use.

Travelers often have to consider gathering a variety of information when making travel plans, such as information about required travel documents, legal issues, famous sightseeing spots, accommodations, public and private transport as well as weather conditions. Due to the variety and quantity of needed information, tourists need time to retrieve and process the needed information. Therefore, the next hypothesis is posed as follows:

H_3: Expected effort has a positive influence on tourist satisfaction with TMA.

- *The influence of enjoyment motivation on tourist satisfaction with travel applications:* Enjoyment motivation, defined as the pleasure derived from using technology, has been shown to play an important role in technology acceptance and use (Brown & Venkatesh, 2005). Choi et al. (2019) noted that the perceived hedonic benefits of a travel app influence satisfaction with that app because most travel apps offer games, prizes and other

incentives as well as challenges to bring laughter and entertainment to tourists. They can also make a trip more enjoyable thanks to the information they provide about places of interest or personalized recommendations for activities at the destination. Enjoyment motivation affects user satisfaction. If the user has fun and entertainment when using the application, it will increase satisfaction with the application. Many studies have confirmed this relationship in some fields of mobile applications, such as fast-food delivery applications by Ramos and Catalan (2023) and Lam et al. (2021), mobile store application by Alalwan (2020), tourism application by Coves-Martínez et al. (2023). From the above conclusions, the following hypothesis is proposed:

H_4: Enjoyment motivation has a positive influence on tourist satisfaction with TMA.

- *The influence of tourist satisfaction on intention to continue using TMA:* Some previous studies document that user satisfaction plays an important role in predicting future continued usage behaviour. Bhattacherjee (2001) conducted research on mobile banking services and showed that when user satisfaction is high, they will tend to use the system again. Higher levels of satisfaction can lead users to repeat consumption in the future. This is an important factor in establishing a long-term relationship. Many studies on mobile applications in different fields have demonstrated the influence of satisfaction on the intention to continue using mobile applications such as Weng et al. (2017), Joia and Altieri (2018) or Alalwan (2020). In the field of tourism, studies confirmed the relationship between satisfaction and intention to continue using include Choi et al. (2019), Liu et al. (2023) or Coves-Martínez et al. (2023). However, research on this relationship in the field of tourism - especially mobile applications in tourism is still very limited in quantity. Therefore, hypothesis H_5 expects that:

H_5: Satisfaction with travel applications has a positive influence on the intention to continue using TMA.

3. Research Methods

3.1 Data collection method

Primary data was collected through surveys at famous destinations in Can Tho city such as Ninh Kieu Quay, My Khanh tourist area, Ong De tourist area, Hung Kings temple and Truc Lam Phuong Nam Zen monastery. The survey subjects are domestic tourists coming

to Can Tho City who use TMA to search for information or book travel services. The study focuses on users over 18 years old who frequently use smartphone applications for travel-related needs. The research sample was selected using convenience and snowball sampling methods.

According to Nguyen (2011), to use EFA, the minimum sample size should have a recommended ratio of observations to measured variables of 5:1. Therefore, in this study, with 40 proposed observed variables, the minimum sample size needed is 200 tourists. Besides, to have reliability in testing the appropriateness of the SEM model, the sample size must be from 100 to 200 (Hoyle, 1995). Therefore, the determined minimum sample size meets the minimum requirement in SEM analysis. To prevent unsatisfactory responses to the questionnaire, the sample size was increased to 250 tourists.

3.2 Data analysis method

Before performing EFA, testing the reliability of the scale through Cronbach's Alpha coefficient was performed. Variables that meet the requirements in testing scale reliability and are interdependent will be gathered into factors using the exploratory factor analysis (EFA) method. Next, the study uses PLS-SEM to test the hypotheses. PLS-SEM was chosen as a quantitative analysis technique due to its advantages such as effective analysis in complex cases and the limited amount of information obtained due to sample conditions. PLS-SEM is also more effective in behavioral and marketing research because it does not require normally distributed data (Hair Jr et al., 2017).

4. Results and Discussions

4.1 Data description

After collecting 250 questionnaires, they were filtered to remove invalid ones due to missing information. There are 212 valid questionnaires for data analysis. The research sample had a negligible difference in the number of male and female tourists with the respective rates being 52.8 and 47.2%. Most respondents are between the ages of 18 and 30 years old (73.1% of total respondents). This is the age group with very high access to TMA today. In addition, the research sample had 46 people between the ages of 31 and 45 years old (accounting for 21.7%). The remaining 11 people were aged over 45 years

old or older (accounting for 5.2%). The age groups in this study are consistent with the age group structure of mobile application users in studies on mobile application users published by the "We are Social" organization that young people are the highest users of the application.

Most tourists in the sample who have ever used TMA of online travel agencies to search for information or book travel services have university degrees (accounting for 68.4%). Regarding professional characteristics, most tourists are office workers (34.4%) and officials (22.6%). These tourists have jobs, stable income and are also people who often travel on business. The highest average monthly income of tourists in the research sample is 23 million VND/month, while the lowest is 3 million VND/month. The average income of respondents is 7.2 million VND/month. Most of the respondents were working and had stable jobs, the respondents' income was relatively high.

With the development of the Internet and mobile devices, TMA are becoming more popular and necessary for travelers around the world in general and Vietnam in particular during their travel trips. Survey data of 212 tourists shows that Traveloka application is the application chosen by most tourists (57.5% of the total respondents). Next, the application that many people choose to use frequently is Booking.com with 80 people (accounting for 37.7%). Agoda application ranked third among the applications commonly used by tourists with 63 respondents (29.7%). The group of TMA originating from Vietnam ranked next in descending order of number of choices are Vietnam Booking, iVIVU, Viettravel, Mytour, Vntrip (with the proportion of respondents was 18.9%, 11.8%, 9.9%, 7.1%, 5.2% respectively). In addition, other foreign online travel agency applications are also used such as Tripadvisor, Expedia and Klook.

Most tourists have only used TMA in the last 6 months (accounting for 53.8% of the total respondents). Meanwhile, 18.4% of respondents said they had used travel mobile applications for about 6 months to less than 1 year. Besides, there are 14.2% respondents being used TMA of online travel agencies from over 1 year to less than 2 years and 13.6% used the application for 2 years or more. In addition, statistics also show that the majority of tourists know about online travel agencies' TMA through social networks (75.5%), followed by information sources from friends and relatives (36.3%), from websites (28.3%) and 9.9% from newspapers and magazines.

In general, the three applications most frequently used by travelers are Traveloka, Booking.com and Agoda. These three applications all originate from abroad. Hence, it could be said that foreign online travel agencies are occupying a very large market in Vietnam. This investigation result is consistent with market research on the current situation of using online travel agency platforms in Vietnam by tourists conducted by Q&Me in 2021. This study also had results stating that Traveloka, Booking.com and Agoda are the most used applications. Besides, mobile applications of online travel agencies originating in Vietnam that are frequently used by tourists account for a relatively modest proportion. Therefore, tourism mobile applications originating in Vietnam need to be invested more to be able to self-serve the home market and improve competitiveness with units originating from foreign countries. In addition, the survey results show that over half of tourists to Can Tho City in the sample have recently used TMA. This could be a new trend in tourist travel behavior. The trend could be originated from the fact that these applications have only been focused on promoting access to tourists in recent years. Hence, TMA could be an effective channel for units operating in the tourism sector to convey information and tourism services to tourists in the future.

4.2 Results of testing the reliability of the scale and EFA

The results of Cronbach's Alpha analysis show that all variables ensure reliability. Then, the study performed EFA with observed variables of independent factors, intermediate factors and dependent factors.

The scale of factors affecting satisfaction with TMA is evaluated through 31 observed variables belonging to 7 factors including metacognitive CQ, cognitive CQ, motivational CQ, behavioral CQ, performance expectancy, effort expectancy and enjoyment motivation. The results of EFA for the first group of independent variables showed that all 7 factors from the 31 initially observed variables were extracted. The total variance extracted of these factors was 55,423%, which means that these factors can explain 55.423% of the variation in the data. There is no change of observed variables among 7 factors compared to the initially proposed research model. Based on the results of rotating matrix analysis, the factor loading coefficients are all greater than 0.5, so they meet the requirements except for observed variables COG 4, COG5 belonging to the cognitive CQ factor and MOT3 belonging to the motivational CQ factor. The factor loading of these

observed variables is less than 0.5, so they are eliminated from the model. The remaining 28 variables continue to be included in the second EFA (Table 1).

Table 1. Rotated matrix of independent factors for the second time

No.	Code	Observed variables	Factors						
			1	2	3	4	5	6	7
Behavioral CQ									
1	BE4	I change my body language as needed to communicate in a multicultural environment.	0.776						
2	BE3	I vary my speaking speed as needed to communicate in a multicultural environment.	0.741						
3	BE1	I change my verbal behavior (e.g. tone, intonation, etc.) when I need to communicate in a different cultural environment.	0.705						
4	BE5	I change my facial expressions when I need to communicate in a multicultural environment.	0.692						
5	BE2	I use different pauses and silences to suit the multicultural environment.	0.669						
Motivational CQ									
6	MOT4	I like living in cultures that are different from mine.		0.843					
7	MOT1	I like interacting with people from different cultures.		0.814					
8	MOT2	I am confident that I can communicate with local people in a culture that is unfamiliar to me.		0.731					
9	MOT5	I am confident that I can get used to shopping conditions in another culture.		0.718					
Metacognitive CQ									
10	MET1	I am conscious of the cultural knowledge I use when interacting with people from many different cultures.			0.784				
11	MET3	I am aware of the cultural knowledge that I apply in interactions with different cultures.			0.760				
12	MET2	I adapt my cultural knowledge when interacting with people whose culture is different from mine.			0.743				
13	MET4	I test the accuracy of my cultural knowledge when I interact with people from different cultures.			0.715				
Performance expectancy									
14	PE2	Using online travel application on a mobile device helps me do many things related to my travel purposes more conveniently and easily.				0.889			

No.	Code	Observed variables	Factors						
			1	2	3	4	5	6	7
15	PE3	Using online travel application helps me get everything done for my trip faster.				0.736			
16	PE1	I find online travel application on a mobile device useful in my travel experience.				0.694			
17	PE4	Using online travel application on mobile devices increases my travel productivity.				0.661			
Effort expectancy									
18	EE2	Interaction with online travel application on mobile devices is very clear and easy to understand (The structure of the application such as layout presentation, movement operations, selection… is very easy understand).					0.904		
19	EE3	I find online travel applications on mobile devices easier to use than other accessible platforms (such as desktop websites, mobile websites...)					0.774		
20	EE1	Learning how to use online travel applications on mobile devices was easy for me.					0.619		
21	EE4	I easily master online travel applications on mobile devices.					0.574		
Cognitive CQ									
22	COG2	I know the rules (e.g. vocabulary, gramma…) of other languages.						0.786	
23	COG3	I know the cultural values and religious beliefs of other cultures.						0.754	
24	COG1	I know the legal and economic systems of other cultures.						0.731	
25	COG6	I know the rules of nonverbal behavior in other cultures.						0.672	
Enjoyment motivation									
26	HM3	The use of online travel mobile applications is entertaining.							0.844
27	HM1	I'm excited to use online travel application on mobile device.							0.771
28	HM2	Using online travel application on mobile devices brings exciting experiences.							0.716
Eigenvalues			7.684	2.984	2.491	1.966	1.659	1.557	1.109
Total variable extracted of 7 factors (%)						59.640			
KMO coefficient						0.859			
Sig. value of Bartlett test						0.000			

The results show that the observed model is appropriate and there is no change in the grouping of observed variables compared to the initially proposed research model. The

EFA results for factors of satisfaction and factor of intention to continue using also extracted two factors as initially proposed (Table 2).

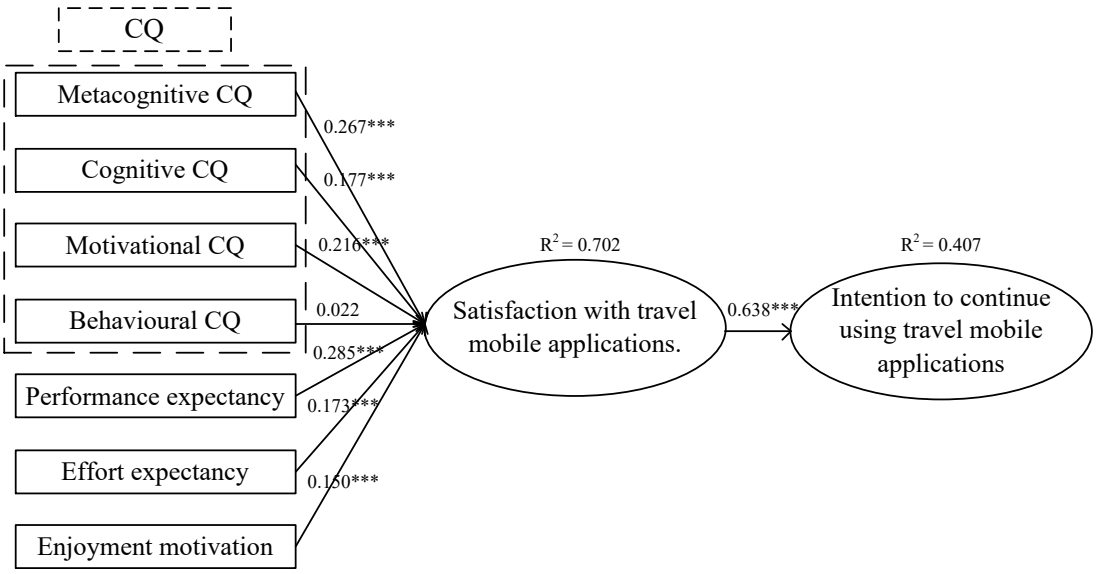
Table 2. Rotated matrix of moderating variables and dependent variables

No.	Code	Observed variables	Factor loading	No.	Code	Observed variables	Factor loading
Satisfaction with TMA				**Intention to continue using TMA**			
1	SAT1	I feel happy while using online travel applications on mobile devices.	0,830	1	CI4	I intend to continue using online travel applications on mobile devices for future travel purposes.	0.862
2	SAT5	I think I made the right decision to use online travel applications on mobile devices.	0.809	2	CI1	I will always try to use online travel applications on mobile devices during my travels.	0.855
3	SAT4	Overall, I am completely satisfied with online mobile travel application's services.	0.808	3	CI2	I intend to continue using the online travel applications on my mobile device during my travels instead of deleting the application.	0.847
4	SAT3	The online travel applications on mobile devices completely satisfied my expectations.	0.795	4	CI3	My intention is to continue using online TMA rather than alternative tools.	0.833
5	SAT2	I feel very satisfied with using online travel application on mobile devices.	0.742				
Eigenvalues			3.178	Eigenvalues			2.888
Total variable extracted (%)			63.554	Total variable extracted (%)			72.193
KMO coefficient			0.859	KMO coefficient			0.825
Sig. value of Bartlett test			0.000	Sig. value of Bartlett test			0.000

4.3 Results of PLS-SEM

Before estimating PLS-SEM, the evaluation of the measurement model is performed based on three aspects including scale reliability, convergent validity and discriminant validity. To evaluate scale reliability, the analysis results show that Cronbach's Alpha and composite reliability (CR) of all factors are greater than 0.7. Therefore, the research model ensures the reliability of the scale. In addition, all AVE coefficients of factors are greater than 0.5 and all outer loading coefficients of observed variables are greater than 0.7. Besides, all HTMT coefficients range from 0.044 to 0.734, all less than 0.9. Therefore, the scale achieves discriminant validity.

The estimated results of PLS-SEM in Figure 1 show that there are 6 factors having a significantly positive influence on satisfaction with TMA including metacognitive CQ, cognitive CQ, motivational CQ, performance expectancy, effort expectancy and enjoyment motivation. The estimated coefficient of behavioural CQ factor is not statistically significant. The above factors explain 70.2% of the variation in satisfaction with TMA. In addition, statistical evidence also shows that the factor of satisfaction with TMA has a positive influence on the intention to continue using TMA. This satisfaction factor explains 40.7% of the variation in the intention to continue using TMA.



*Notes: ***, ** and * represent statistical significance levels of 1%, 5%, and 10%, respectively*

Figure 1: PLS-SEM linear structural model results

- *Metacognitive CQ:* Metacognitive CQ is found to have a positive influence on tourists' satisfaction with TMA with a weight of 0.267 at the 1% significance level. Therefore, the statistical evidence supports hypothesis $H_{1.1}$. This implies that the higher tourists' metacognitive CQ is, the higher their satisfaction with TMA. Metacognitive CQ enables individuals to adapt and modify their strategies to be more culturally appropriate and more likely to achieve desired outcomes in cross-cultural encounters. That allows travellers to adapt and adjust their behaviour to the cultural differences between the app user and the app producer's culture.

- *Cognitive CQ:* The statistical evidence also supports hypothesis $H_{1.2}$ that cognitive CQ has a positive influence on tourists' satisfaction with TMA. This demonstrates that the higher cognitive CQ tourists have, the higher their satisfaction with the travel mobile application. The cognitive aspect of CQ is an important component of CQ because cultural knowledge influences human thinking and behaviour. Understanding a society's culture and its components allows individuals to better appreciate the systems that shape and cause specific patterns of social interaction within a culture. Therefore, people with high cognitive CQ are better able to interact with people from a different cultural society. It can also lead to better traveller engagement with travel mobile apps.

- *CQ motivation:* The estimation results in Figure 1 also show that motivational CQ has a positive influence on tourists' satisfaction with TMA. TMA have various attractive features such as booking hotel rooms, booking airline tickets, consulting travel information… that make it much more convenient and flexible for visitors to search for information and book travel services compared to traditional ways such as going to service providers or booking on websites. Accordingly, tourists can save more time and effort as well as achieve more productivity during their travel trip. From there, tourists will feel more satisfied with the travel mobile application. Therefore, building a more useful tourism mobile application system such as increasing convenience during use, increasing processing speed as well as tourism-related features could be necessary to make tourists to be more satisfied. Studies in the context of technology adoption have confirmed that the functional benefits of technology contribute to enhancing user satisfaction. This is shown in the case of using mobile food ordering applications (Alalwan, 2020; Ramos & Catalan, 2023), ride-hailing applications (Joia & Altieri, 2018; Weng et al., 2017) or in the tourism sector (Choi et al., 2019; Coves-Martínez et al., 2023; Liu et al., 2023).

It can be said that previous studies have not or very little studied the impact of CQ components on satisfaction with tourism mobile applications. The discovery that the metacognitive CQ, cognitive CQ and motivational CQ aspects have a positive influence on satisfaction with TMA helps us better understand which aspects of CQ actually influence to satisfaction. This result will contribute to clarifying the research results of Coves-Martínez et al. (2023) that CQ has a positive influence on satisfaction with TMA.

- *Effort expectation:* The results of PLS-SEM show that effort expectation is positively correlated with tourist satisfaction. Therefore, hypothesis H_3 is supported. In other words, if other factors remain constant, the easier it is for tourists to perceive using a travel mobile application, the more satisfied they will be with the experience of using a travel mobile application. This is suitable for the context of the topic because most users are new tourists who have only recently used mobile travel applications, so their experience in using the application is not high. At the same time, TMA have only become popular in recent years in Vietnam. Therefore, the tourism mobile application system has many novel features for users, making effort expectation in the UTAUT2 model more meaningful. The results of this study are consistent with the results of studies on other mobile applications such as Lam et al. (2021), Ramos and Catalan (2023) or Coves-Martínez et al. (2023).

- *Enjoyment motivation:* The factor of enjoyment motivation positively affects tourists' satisfaction with TMA with a weight of 0.150 and 99% confidence level, so hypothesis H_4 is also supported. This implies that if other factors remain unchanged, the more motivating tourists feel coming from mobile travel applications will lead to their greater level of satisfaction with this application. TMA are still a technology that has only become popular in Vietnam in recent years. Therefore, the use of such applications can accelerate customer satisfaction and enjoyment. Therefore, travel e-commerce enterprises should fully consider the important influence of user psychology on application satisfaction in the process of actively improving the quality of travel applications. This result is consistent with the results from other fields such as Alalwan (2020) or Ramos and Catalan (2023).

- *Satisfaction with* TMA*:* The analysis results in Figure 1 show that the estimated coefficient of the satisfaction factor is 0.638 with a statistical significance of 1%. In other words, if other factors remain constant, the higher a tourist's satisfaction, the higher their intention to continue using TMA. This finding suggests that satisfaction is an important factor in studying behaviour after using travel apps. It can be seen that satisfaction is a strong predictor of tourists' intention to continue using TMA, so service providers need to focus on improving tourist satisfaction towards using travel apps to increase their intention to continue using travel apps in the future. This result further strengthens the relationship between satisfaction and continuance intention to use technology in the

expectation confirmation model (Bhattacherjee, 2001). This result has been supported by many studies on mobile applications in different fields in proving the influence of satisfaction on the intention to continue using the application such as Choi et al. (2019), Liu et al. (2023) or Coves-Martínez et al. (2023).

To evaluate the reliability of the model estimates, Bootstrap analysis with a repeated sampling method with replacement from the initial sample (n=212) is used. The estimated results with 5000 times were averaged. Bootstrap results show that all weights do not have significant differences. Thus, the estimates in the model can be concluded to be reliable.

5. Conclusions and Recommendations

The number of smartphone users has increased rapidly around the world and Vietnam is no exception to that trend. The Vietnamese spends averagely more than 4 hours a day using their smartphone. This represents a cultural change in users' use of technology. Thus, it could be said that the use of smartphones has significantly changed behavior and business processes in the tourism sector. The new point of this study is to apply the UTAUT2 model with a group of personal belief variables to predict the intention to continue using through the premise of satisfaction with the application. This study also examines the influence of some aspects of cultural intelligence on satisfaction with tourism applications such as metacognitive CQ, cognitive CQ, motivational CQ and behavioral CQ which has not been investigated in previous studies.

Data was collected through a survey of 212 tourists to Can Tho City who had used online travel agency mobile applications by convenience sampling. The research sample had a slightly higher number of male tourists than female tourists. Online travel agency mobile applications are often chosen by tourists from abroad, of which the three applications most chosen by tourists are Traveloka, Agoda and Booking.com. In general, tourists have only recently used TMA. This may be a trend for tourists in the future. Social networks are the information channel that many tourists choose the most when learning more about TMA.

The estimated results of PLS-SEM show that there are six factors affecting satisfaction with tourism mobile applications, namely Metacognitive CQ, Cognitive CQ,

Motivational CQ, Performance Expectancy, Effort Expectancy, and Hedonic Motivation. In addition, the research results also show that satisfaction with tourism mobile applications has a statistically significant positive effect on tourists' intention to continue using tourism mobile applications. Based on the analysis results, some managerial implications to help improve tourists' intention to continue using tourism mobile applications are proposed. Specifically, as follows:

- *Travel app designers should consider the cultural intelligence of users:* In the context of tourism, technology providers and app designers need to pay special attention to the CQ of users. An effective travel app that provides accurate, personalized, and high-quality information about a destination will maximize the benefits for individuals with high CQ. These users are likely to fully utilize the app's potential to enhance their travel experience. At the same time, companies should consider both the ability of their customers and the ability of their employees to adjust to different cultural environments. The application should prioritize the most representative cultures so that customers can better understand the culture of each place. As shown in the cognitive CQ scale, many different topics can be covered, from legal and economic systems to marriage traditions, religion, etc. This knowledge can help tourists choose a satisfactory destination.

- *Mobile application providers should enhance users' cultural motivation:* The applications should offer personalized and interesting travel programs, unique and interesting, creating excitement in the cultural connection at the tourist destination. If apps help address the above issues, individuals with CQ will take full advantage of the technology because they are more motivated and immerse themselves more fully in different cultures.

- *Exploiting and enhancing the functions of* TMA*: S*oftware developers should conduct customer surveys to be able to connect with users to create a more user-friendly system and to resolve user requests more quickly. Furthermore, services on TMA should make efforts to provide convenient package travel services. They should connect with related services such as payment services, e-wallets, etc. to increase the efficiency of using travel applications for tourists.

- *Improving and refining the application to create an easy-to-use interface for users:* Application operators should aim to design the user interface, navigation system and

menu bar of the application to be simple. The instructions should be clear and easy to understand. The travel mobile application should integrate the function of user instructions and resolve common errors in writing or can apply a smart chatbox based on artificial intelligence applications to provide quick and convenient instructions. There should be a call center link to help tourists receive timely instructions. App developers can survey users to identify their difficulties in using mobile apps and mitigate the adverse effects of effort expectancy.

- *Increasing the entertainment, comfort, and enjoyment of tourists using* TMA*: A*pplication designers should design application content in a way that creates fun, intuitive and lively for users, for example, incorporating entertainment elements into the application by adding interactive games, adding background music to interactive items, etc.

- *Improving the factors that make up tourists' satisfaction with* TMA *as well as conducting a survey on user satisfaction with the application: T*ravel applications should conduct periodic surveys on user satisfaction with travel applications and collect factors that make users dissatisfied with the company's application. From there, companies can overcome factors that make customers dissatisfied and thereby help to further improve the application system.

This study employed a convenient sampling method combined with a snowball sampling. To make the research results more representative, a random sampling method should be used. Moreover, the survey was confined to tourists visiting Can Tho City. Broadening the geographical scope of the survey would further strengthen the representativeness and generalizability of the study.

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