Impact of Mobile Application Characteristics on the Application Engagement and Intention for Continuing Use in Tourism Industry

Şensev Payan İlkan

Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
in
Tourism Management

Eastern Mediterranean University
September 2023
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

Prof. Dr. Ali Hakan Ulusoy
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Doctor of Philosophy in Tourism Management.

Prof. Dr. Hasan Kılıç
Dean, Faculty of Tourism

We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Doctor of Philosophy in Tourism Management.

Prof. Dr. Turgay Avcı
Co-Supervisor

Prof. Dr. Ali Öztüren
Supervisor

Examining Committee

1. Prof. Dr. Atilla Akbaba
2. Prof. Dr. Oktay Emir
3. Prof. Dr. Anıl Kemal Kaya
4. Prof. Dr. Ali Öztüren
5. Asst. Prof. Dr. İlkay Yorgancı Maloney

ABSTRACT

Mobile devices have become essential components of the tourism industry. The importance of travel-based mobile apps is subsequently on the rise, particularly in marketing. Going onto mobile platforms is simple and necessary, even for the smallest businesses, as they will be able to connect with many travelers worldwide who prefer using their smartphones to plan their trips. In such a competitive environment, businesses should seek ways to attract consumers to their apps and keep them engaged. The study investigates the conceptual model using the Diffusion of Innovation Theory (DOI) and Uses and Gratifications Theory (UGT). An online survey questionnaire was designed and administered to 510 European consumers who were required to have a smartphone and use a mobile application for their tourism transactions. The study outcomes show that simplicity, compatibility, benefit, and playfulness positively influence user satisfaction, and perceived value is positively influenced by simplicity, compatibility, and benefit. The study also revealed that mApp engagement and intention for continuing use are positively impacted by user satisfaction. These outcomes will generally shed light on tourism organizations, software mobile application developing companies, and user interface/user experience designers regarding the consumer's perception and requirements from a mobile application.

Keywords: Mobile Tourism Application, Diffusion of Innovation Theory, Uses and Gratifications Theory, Perceived Value, User Satisfaction, Mobile Application Engagement, Intention to Continue Use

ÖZ

Mobil cihazlar turizm endüstrisinin önemli bileşenlerinden birisi olarak görülmektedir. Seyahat tabanlı mobil uygulamaların önemi turizmde gün geçtikçe, özellikle pazarlama açısından, artmaktadır. Seyahatlerini planlamak için akıllı telefonlarını kullanmayı tercih eden dünya çapındaki birçok gezginle bağlantı kurabileceklerinden, mobil platforma geçmek en küçük işletmelerin bile katılması için bir gereksinimdir. Böylesine rekabetçi bir ortamda işletmeler, tüketicileri uygulamalarına çekmenin ve ilgilerini canlı tutmanın yollarını aramalıdırlar. Bu çalışma İnovasyonun Yayılması Teorisi (Diffusion of Innovation Theory -DOI) ile Kullanımlar ve Doyumlar Teorisini (Uses and Gratifications Theory -UGT) kullanılarak kavramsal modeli araştırmaktadır. Çevrimiçi anket formu tasarlanmış olup, her türlü turizm işlemleri için akıllı telefon ve mobil uygulama kullanan 510 Avrupalı tüketiciye uygulanmıştır. Çalışma sonuçları, sadelik, uyumluluk ve faydanın kullanıcı memnuniyeti ve algılanan değer üzerinde olumlu bir etkiye sahip olduğunu, oysa yalnızca eğlencenin kullanıcı memnuniyeti üzerinde olumlu bir etkiye sahip olduğunu göstermektedir. Çalışma ayrıca, mobil uygulama etkileşimi ve sürekli kullanım niyetinin kullanıcı memnuniyetinden olumlu etkilendiğini ortaya koydu. Bu sonuçlar genel olarak turizm organizasyonlarına, mobil yazılım uygulama geliştiren firmalara ve kullanıcı arayüzü/kullanıcı deneyimi tasarımcılarına tüketicinin mobil uygulamadan algısı ve gereksinimleri konusunda ışık tutacaktır.

Anahtar Kelimeler: Mobil Turizm Uygulaması, İnovasyonun Yayılması Teorisi, Kullanımlar ve Doyumlar Teorisi, Algılanan Değer, Kullanıcı Memnuniyeti, Mobil Uygulama Etkileşimi, Sürekli Kullanım Niyeti

ACKNOWLEDGEMENT

I wish to express my deepest appreciation to everyone who contributed to my academic success. Most significantly, I want to express my gratitude to my supervisor, Professor Dr. Ali ÖZTÜREN, for being more than a supervisor and providing his professional support and assistance while carrying out this study. Your insightful comments have motivated me to sharpen my thinking and improve my work.

I would like to share my thanks to my co-supervisor Prof. Dr. Turgay AVCI for his support throughout my academic education period in the Faculty of Tourism.

I would also like to thank Dr. Foad IRANI, who always provided unwavering support and steered me in the right direction all through this time. It couldn't be possible without you.

Finally, my family, loved ones and best friends, I share my full lifetime of gratitude for their unconditional love. Throughout the years, they have been a constant source of encouragement, support, and strength.

Thank you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BEN	Benefit
COM	Compatibility
DOI	Diffusion of Innovation Theory
ENG	mApp engagement
ICU	Intention to continuing use
INF	Informativeness
mApp	Mobile application
PLA	Playfulness
PV	Perceived value
SIM	Simplicity
SAT	User satisfaction
UGT	Uses and Gratification Theory
UI/UX	User interface/user experience design
UNWTO	United nation world tourism organization
WTTC	World travel & tourism council

Chapter 1

INTRODUCTION

1.1 Overview

With the increasing popularity of new mobile communication technologies and mobile-based applications, mobile technology will continue to alter people's lifestyles and the manner in which industries operate. The tourism industry is highly affected by mobile technology (Chen et al., 2020). Many travel ideas, such as mobile tourism, smart tourism, e-tourism, and sustainable tourism, have been created or improved by mobility-related equipment (such as smartphones, tablets, glasses, or other wearable devices), technology, data, and services. Mobile technologies have taken over as the main methods for users to access the Internet, becoming an essential aspect of tourists' daily lives, as they have the ability to combine Information and Communication Technologies (ICTs) with mobility features (Wang et al., 2012). The tourism and hospitality sectors have seen a radical shift in consumer behavior and business operations because of mobile technologies (Wang et al., 2016).

The utilization of mobile technologies has resulted in many changes in the operation, management, and delivery of tourism services in recent years (Bernritter et al., 2022; Chen et al., 2021; Parapanos & Michopoulou, 2023). Mobile devices used around the world are expected to reach 18.22 billion by 2025 (The Radicati Group, 2021).

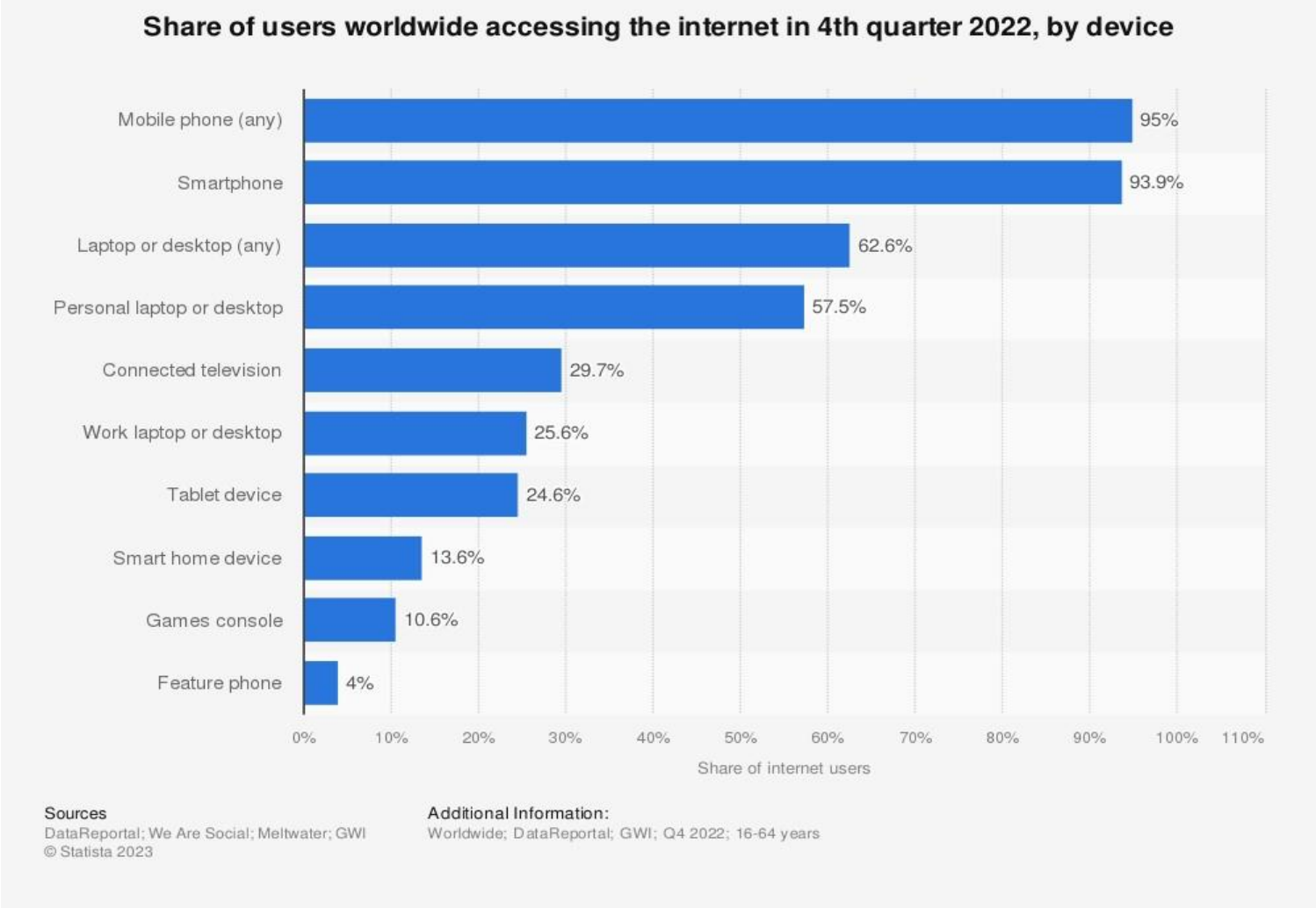

Figure 1: Percentage of global internet users, by device, in the fourth quarter of 2022.

Another statistic shows the percentage of global Internet users by device in the fourth quarter of 2022. Figure 1 demonstrates the outcomes, which show that the highest rate is achieved by mobile phones/devices. 95% of global users use mobile devices to access the Internet, while almost 94% use their smartphones (Statista, May 2023). People prefer using mobile devices to access Internet content in their daily lives for various reasons.

Young consumers aged between 16 and 24 years use their smartphones and related apps for social networking and messaging for more than four hours every day. An average adult, aged between 25 and 34 years, follows this rate with 3.45 hours per day (Statista Digital Market Insights, Jun 2019). Figure 2 highlights significant transformations in technology usage. Approximately 85% of a smartphone user's time is spent on apps, demonstrating how mobile technology, with the aid of the Internet and the availability of applications, has created an important breakthrough for a variety of businesses, including tourism, in terms of improving customer service and preserving engagement (Techcrunch, 2015).

Likewise, mobile applications (mApps) make devices meaningful and more functional. Global mobile app revenues are forecasted to exceed 700 billion US dollars by 2027 (Statista et al., June 2023). The revenues have been classified according to different fields travel based mobile apps worldwide have shown an enormous increase in revenue, rising from 556.34 million US dollars in 2019 and is projected to increase to 1964.44 million US dollars by 2027.

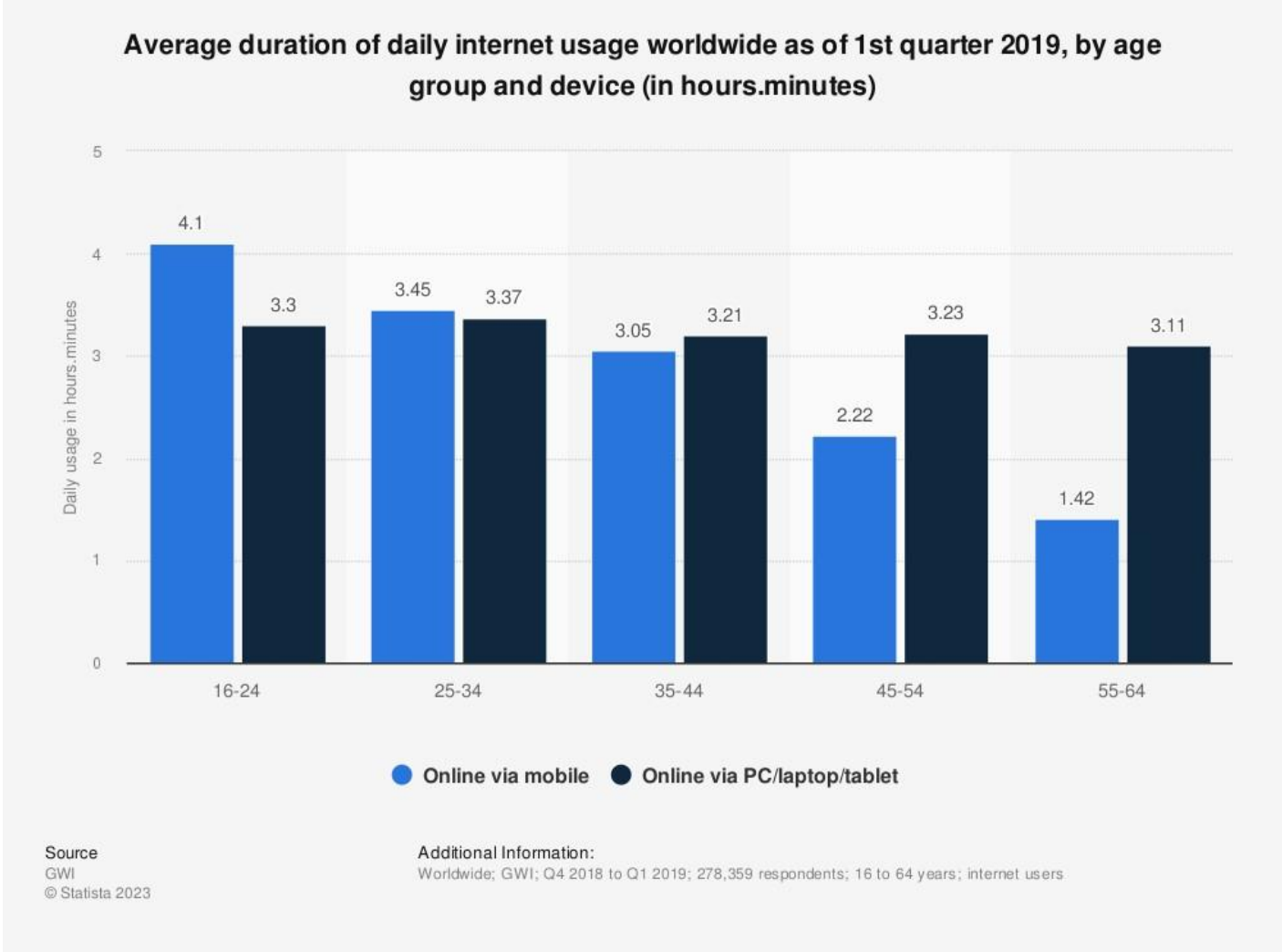

Figure 2: The average duration of daily internet usage worldwide as of 1st quarter of 2019, by age group and device (in hours.minutes)

Consumers are heavily dependent on mobile devices for many different tasks, such as booking a restaurant or vacation, asking for directions, guiding themselves to new places, and following reviews when making decisions. Mobile technology is a new channel for reaching potential consumers (Myers & Scarinci, 2022). Every sector has a perception of improving its business using mApps. Therefore, policymakers must recognize the significance of mobile technology in the tourism sector and invest more in apps, websites, and other tourist-oriented environments. To foster a new economic environment for tourism, many locations have made an effort to benefit from the advantages offered by the e-business revolution (Hassan & Sharma, 2020). Hassan and Sharma's book (2020) emphasizes how ICT applications have impacted several elements of the travel industry, resulting in more creative destination marketing strategies.

Within the tourism framework, consumers can easily plan their trips using their devices (Medeiros et al.,2022). They can receive support and navigation during their vacation and provide feedback (Medeiros et al.,2022). Mobile applications (mApps) allow consumers to connect with travel companies through direct channels (Myers et al., 2022). Applications that provide unique services and experiences to consumers have a more competitive advantage over others and have quickly become one of the most popular applications (Stocchi et al., 2021). However, the downside is that only around one-third of users continue to use an app a month after the initial trial, and this figure drops to just 4% after a year (Flurry, 2011).

Currently, tourist behavior is significantly transformed by the concept of mobile technology (Kim et al., 2016). Consumer attitudes have been observed to change in processes such as collecting and processing data, communicating with other travelers, and the way they interact with service suppliers (Wang et al., 2012). According to Neuhofer et al. (2014), understanding how people use their mApps for travel is critical because mobile technology has the potential to dramatically expand connections between companies and consumers, creating a more individualized experience.

Today, young generations like the millennials have needs that are rather different from those of their parents or ancestors within the field of tourism (Glover, 2010). They exhibit an increased desire to travel, regardless of financial or timing restrictions, compared with other generations (Santos et al., 2016). The tourism industry faces competition from the younger generation due to its characteristics, with the possibility of changing the way the industry is structured (Santos et al., 2016). Therefore, gaining a better understanding of this segment's characteristics and needs is necessary for all stakeholders in the tourism industry.

Mobile applications have gross potential for consumers and help lead to an organization's success (Rahimizhian et al., 2020). Therefore, this study will bring more awareness to the impact of mApp characteristics on the engagement and intention for continuing use in the tourism industry. The results are expected to contribute to the literature from the consumers' perspective instead of the developers' perspective. It will highlight the hedonic concept of mApps and what makes the consumer pleasant or unpleasant regarding a mApp.

This study's importance is finding the weak points that software application developers and tourism industry organizations may lack attention to while developing a new application. Both sides tend to miss out on developing loyalty and long-term relationships with their consumers over mApp. Therefore, it is important to understand how the application is perceived from consumers' perspective.

The next section of the paper consists of the theoretical background, the hypotheses, and the research model. The research methodology is discussed after that. The final section includes the study's conclusion, theoretical and practical implications, and limitations.

1.2 Problem Statement

Although the mobile revolution has significantly strengthened travel-based activities, little is known about how it has changed people's experiences before and during the on-the-go travel period (Apple, 2008). This information is essential because a better understanding of how customers use travel-related applications to plan their vacations could offer tourism businesses insightful information about opportunities, addressing the issue of consumers' limited access to information that could enhance their travel experiences. To solve this issue, travel-related businesses must first understand the unsatisfied requirements of consumers that they experience before, during, and after their trip to develop suitable solutions.

First, it is essential to understand why consumers download and use a travel-based application. Research has gathered that people download applications for functional reasons, such as searching for flights/accommodation, booking flights/accommodation, availing of an offer/promotion, keeping updated, and many

more (Medeiros et al., 2022). Even though applications provide similar services, understanding the engagement level and continuing use is another pressing argument. Statistics show that the retention rate for tourism-based mApps remains at 20% after day 1 of post-install, 7.6% after day 7, and drops to 3.6% by day 30 (Liftoff, 2020), prompts research and clarifying the reason behind consumers' engagement with an application and what causes them to continue or discontinue using the application after a certain time. Limited research exists regarding the determinants that impact users' engagement and continued use of mApps.

There has been considerable research conducted on the innovation qualities, perceived value, user satisfaction, and what motivates user's intention to continue use of an innovation. Many innovative quality metrics are considered for innovation tools of desktop platforms such as websites and social networking sites, which are alternative communication channels and marketing tools for businesses. Abbaspour & HazarinaHashim's (2015) study highlights the qualities of websites that influence customer satisfaction. His study findings indicate that innovative elements such as website design, informativeness, responsiveness, and interactivity have a positive influence on customer satisfaction (Abbaspour & HazarinaHashim, 2015). Kim et al. 2017 study state that mobile app gains and practices play a significant role in predicting the users' intention to revisit mobile social network sites (Kim et al., 2019). Chaouali's (2016) findings support that user satisfaction has a positive impact on sustained intention to use mobile social networking sites.

Various studies have used the Diffusion of Innovation Theory (DOI) with the innovation constructs, while others have used the Unified Theory of Acceptance and Use of Technology (UTAUT) with the psychological constructs. Emotional

requirements of using an application have been shown to influence users' emotional experiences, which is imperative for sustainable application usage (Dirin et al., 2018). Kim et al.'s (2019) study combines the Diffusion of Innovation Theory (DOI) with the Uses and Gratifications Theory (UGT) to understand the motives that prompt users to use mobile social networking sites for sustainable resolutions.

The volvingg and rising importance of the inclusion of mobile technologies and applications within the tourism sector entices increasing amounts of scholars. Between the years 2012 and 2017, 126 articles have been published regarding mobile technologies and applications topics. 35% were technological and provider perspectives, and 65% were consumer perspective studies. The subthemes of these studies include consumer attitudes, consumer intentions, smartphone/smart technology acceptance and consumer preferences, tourist experiences, and co-creation (Dorcic et al., 2019).

Although many studies have used the keywords simplicity, compatibility, and efficiency as the factors for adopting a mApp, this study will differ by combining DOI constructs simplicity, benefit, and compatibility and the UGT constructs informativeness, social interactivity, and playfulness to analyze their influence on mApp engagement and intention for continuing use of Europe's most popular tourism mApp. The constructs will use mediating variables perceived value and user satisfaction, which have been shown to have positive influences on users' engaging action with innovation and contribute to its continuance usage. Various samples confirm this relationship for websites, i.e. social networking sites, commercial websites, and mobile banking applications. However, lacking research sources are

available on travel-based mApps. Therefore, these variables will be specifically analyzed for tourism-based mApps.

1.3 Purpose of the study

This research seeks to comprehend the impacting factors for mobile app engagement and the intention for continuing use of the mobile app using six properties of innovation: simplicity, compatibility, benefit, playfulness, informativeness, and social interaction. Simplicity, benefit, and compatibility are the features of innovation suggested by the Diffusion of Innovation Theory (DOI) (Rogers, 1983), and informativeness, social interaction, and playfulness are the features of Uses and Gratifications Theory (UGT) that motivate an individual's continuous intention to use an innovation.

The study will refer to mApps, which are popularly used for their various functionalities that help users to secure their trips concerning flights, hotels, restaurants, and possible activities within a destination (Baharuddin et al., 2013). Europe is selected as the target region for inspecting and understanding which elements have influential effects on consumers.

Research questions of the study;

1. How do the constructs of Diffusion of Innovation Theory (DOI) and Uses and Gratifications Theory (UGT) influence user satisfaction (SAT) and perceived value (PV)?
2. How do SAT and PV impact mApp engagement (ENG) and intention for continuing use (ICU) for tourism-related mApps?

1.4 Contributions to the Current Knowledge

This research seeks to make a theoretical contribution by investigating the previous works DOI and UGT and their significant effects on mApp engagement and intention to continue the use of an application, with the mediating effects of user satisfaction and perceived value. The case will be unique for European consumers using the most popular mApp, which is the leading travel-based organization with the greatest number of users, holding a large proportion of the overall market share. The results will give a better understanding of the consumers' mApp perception regarding the different characteristics of the software application. The outcomes will reflect on which characteristics are valued more by the consumer and what enhances them to engage with and continue using the application. These results will give strong indications for the organizations in the travel industry that are seeking effective marketing tools in order to compete and survive in the sector. The study also addresses practical consequences for mApp developers, user-interface designers, and content developers regarding future marketing strategies based on consumer-centric outcomes which will clearly reflect the general needs, preferences, and expectations of the end users and help provide a quality experience for the travelers on the mobile web environment. Understanding and meeting consumer demand is important to maintain perceived value and improve user satisfaction with the mApp, which will enhance engagement and intention to continue using the mApp.

1.5 Organization of the Study

This dissertation has five chapters: an introduction, a literature review, methods sections for the study, a results section, and a conclusion section. The next section of the dissertation report consists of the conceptual background, theoretical background, the hypotheses defined, and the research model. The research methodology is discussed in chapter three. This section includes the research philosophy, sample details, questionnaire development, data collection, and analysis procedure. Chapter 4 explains the findings and results with statistical demonstrations. The final section includes the study's conclusion, theoretical and practical implications, and limitations.

1.6 Definitions of the Terms

Throughout the study, the mApp constructs derived from DOI and UGT theories will be emphasized for their potential influence on the general mApp engagement and intention to continue use. Figure 5 shows the research model of the study. Simplicity, compatibility, and benefit constructs are derived from DOI. According to the DOI, simplicity refers to "the level of the innovation being easy to understand and use," and if there is the perception of relative simplicity (easiness) in its use, the potential adopters would be susceptible to use the innovation. Compatibility relates to the individual's understanding of the innovation convenience to their present standards, past familiarities, and current requirements. A person's social or cultural values and beliefs previously introduced ideas and a person's requirement for innovation (Rogers, 1995) are said to be the critical factors of compatibility. Benefit refers to the "level of which an innovation is supposed to be as better than the idea it is aiming to replace" (Rogers, 1983). Consumers evaluate the benefits of a mApp by comparing it to the pre-existing technologies that they had been using (Min et al., 2019).

The study will also emphasize the constructs derived from UGT. Informativeness is one of the constructs defined as a facility that informs consumers about product/service alternatives. Timeliness of information, accuracy, completeness, and usefulness are the key features of informativeness. Informativeness is also defined as a feature that makes resources available (Chakraborty, 2005). Social interactivity is a very close term and links with informativeness, as interactivity is explained as the transfer of information in a process of communication. Interactivity is the need for the transfer of information in order to exist (Ariel & Avidar, 2015). Interactivity is analyzed as a process-based variable that is affected by responsiveness and interchange in the communication medium. Playfulness and enjoyment have been explained as the perceived fun that the user experiences when using the technology (Van der Heijden, 2004). The playfulness of innovation is essential for motivating consumers to utilize a system. Another study defines playfulness as: "users' interactions with the World Wide Web, their curiosity during such interactions, and their perception of how fun or fascinating those interactions are themselves." (Moon, 2001)

Perceived value is the basis for all marketing decisions. It is one of the major goals to be accomplished by any business that wants to succeed. Many sources define 'value' as the consumer's general assessment of the subjected item or technology based on their views about the received benefit and the given cost. Our study will utilize perceived value to test the effects of the DOI and UGT constructs. User satisfaction is another mediating variable the study will utilize. User Satisfaction is relating to the feelings of the consumer when they are using the mApp. The product may bring a feeling of pleasure or displeasure as a result. Feelings are changeable from one user to

the other. The consumers' perception of satisfaction can be considered withier from a cognitive nature or/and an affective nature.

mApp engagement is the overall judgment of an individual's reaction towards an offering such as a product, service, or website. In the context of mApps this will refer to the user's positive, satisfying, and app-related state of mind that is supported by commitment (enthusiasm, inspiration), absorption (full concentration and deep immersion), and involvement (refers to dedication). When someone expresses a continuing usage for an activity or goal they currently have performed, it is referred to as having a continuation intention (Chen et al., 2021). Intention for continuing use of an application is very important for any business to accentuate the long-term growth of the corporation. The key goal that the company must achieve to remain competitive and compete with its rivals is to achieve consumer mApp engagement and intention for continuing use.

Chapter 2

LITERATURE REVIEW

2.1 Tourism Industry

Also known as the ‘travel industry’ includes people’s movements domestically or internationally from one place to another either for leisure, social reasons, or business purposes. It is one of the world's largest industries, and tourism plays a significant role in the economies of many countries. Transportation, accommodation, food and beverage, entertainment, and other associated industries are all included and part of this industry. The industry contains other industries, such as transportation, accommodation, food and beverage, entertainment, and other related industries.

Tourism is a requirement for a country in terms of economic strength. It also provides many job opportunities for its citizens and helps to decrease unemployment in a country. Tourism can strengthen connections between states or corporations, produce leisure and entertainment opportunities, and raise the worth of a country’s currency.

Countries are looking for ways to use governmental forces and activating commissions to improve tourism-related products and services. They are not only focusing on enhancing their services but also following the recent trends and improvements in order to gain more power in the competitive market of tourism.

It is also a requirement to know the types of travelers. Some people travel for work-related reasons, while others may travel for their purposes, such as to see friends and family, for leisure, entertainment, or other personal reasons. Business travelers have little influence over the decision to travel or where they will go. On the other hand, leisure travel is highly elastic depending on the traveler's choice and preferences. There are other considerations, such as an airline, a certain vacation package, or a specific lodging, that can override pricing when choosing one travel product over another. Age can hinder one's capacity to travel either due to health issues or economic considerations. Travelers may have the funds and the time, yet obligations to their families may prevent them from going on vacation. Although this problem might not stop people from traveling, political peace and stability might restrict their options for travel. Any conflicts, wars, or terrorist attacks may prevent people from traveling to certain locations. Not to mention the pandemic and natural hazards which can pose restrictions on travelers' choices.

People will evaluate distinct aspects of destinations differently. A vast range of human emotions and motivations may come into play when traveling for leisure and enjoyment, some of which may be challenging to articulate. The factors that could explain why people behave in a certain way are known as motivators. They also appear to justify the individuals' behavioral intentions. They are inherent and may be connected to people's inner thoughts, feelings, and beliefs since they arise from needs and desires. Tourism service providers, such as tourism planners, developers and promoters, must show closer attention when understanding reasons people prefer to travel, as well as the factors that influence their choice of location.

2.2 Mobile Technologies and its Global Impact

Cellular communication is made available by mobile technology. Mobile technology has evolved rapidly over recent years. Since the early years of 2000, mobile devices have changed themselves from being nothing but just call-making and receiving communication devices to portable entertainment consoles, GPS navigation tools, integrated web browsers, and live messaging clients. MApps are software tools that make mobile devices meaningful. MApps are being used by people to manage documents, access the Internet, organize files, connect with friends, and for amusement. Users can access mApp features from anywhere. People can complete many of their daily tasks as well as their business tasks using mApps. Several commercial enterprises use these applications to generate income. The mApp has an impact on society.

The majority of mobile phones, even basic models and budget-saving models can operate mApps that are expected to be user-friendly, reasonable, and easily downloaded (Islam et. al., 2010). Due to their extensive functionality, mApps can be used for a variety of purposes, such as making calls, texting, web surfing, chatting, social network communication, audio, video, and gaming. In recent years, mobile phone manufacturers are upgrading their devices' computing capabilities, which is also improving smart mobile applications and their capabilities (Islam et al., 2010). The mApps have a wide range of uses because of their vast capabilities, including calling, messaging, browsing, chatting, social network communication, audio, video, and gaming. In recent years, mobile companies are increasing the computing power of those mobile phones in parallel, rapidly improving the smart mobile application (Islam et al., 2010). MApps are being developed for various tasks, such as live

communication, social media, GPS systems, mobile commerce, entertainment. Statistics show that people use their mobile devices for a minimum of 30 minutes per day for different tasks, 28 percent of respondents used social media applications daily for between 30 and 60 minutes during the second quarter of 2022. 52 percent of people spend 30 minutes or less on e-commerce apps, while 27 percent spend 30 minutes to 60 minutes for similar reasons (Digital Turbine, 2022). This large proportion shows the opportunities companies can gain by opening their marketplace on the mobile technology platform.

According to Statista estimates, mobile internet penetration will hit a new peak in 2028 at 90.44% after five years of increase within Central and Western Europe (Statista Digital Market Insights, Mar 2023). The population's overall access to the Internet via a mobile broadband connection is referred to as the penetration rate. The more penetration, the more people will be accessible by the companies who have an mApp.

Another interesting statistic is regarding the age rate of people in Europe using the Internet daily. The European Union statistics (EUROSTAT) have published the age ranges of consumers using the Internet. In 2022, the EU reported that more than 94 percent of young people aged 16-29 years in all European countries were using the Internet every day, compared with 84 percent of the adult population. The adult population showed different variations according to their country, as in Figure 3.

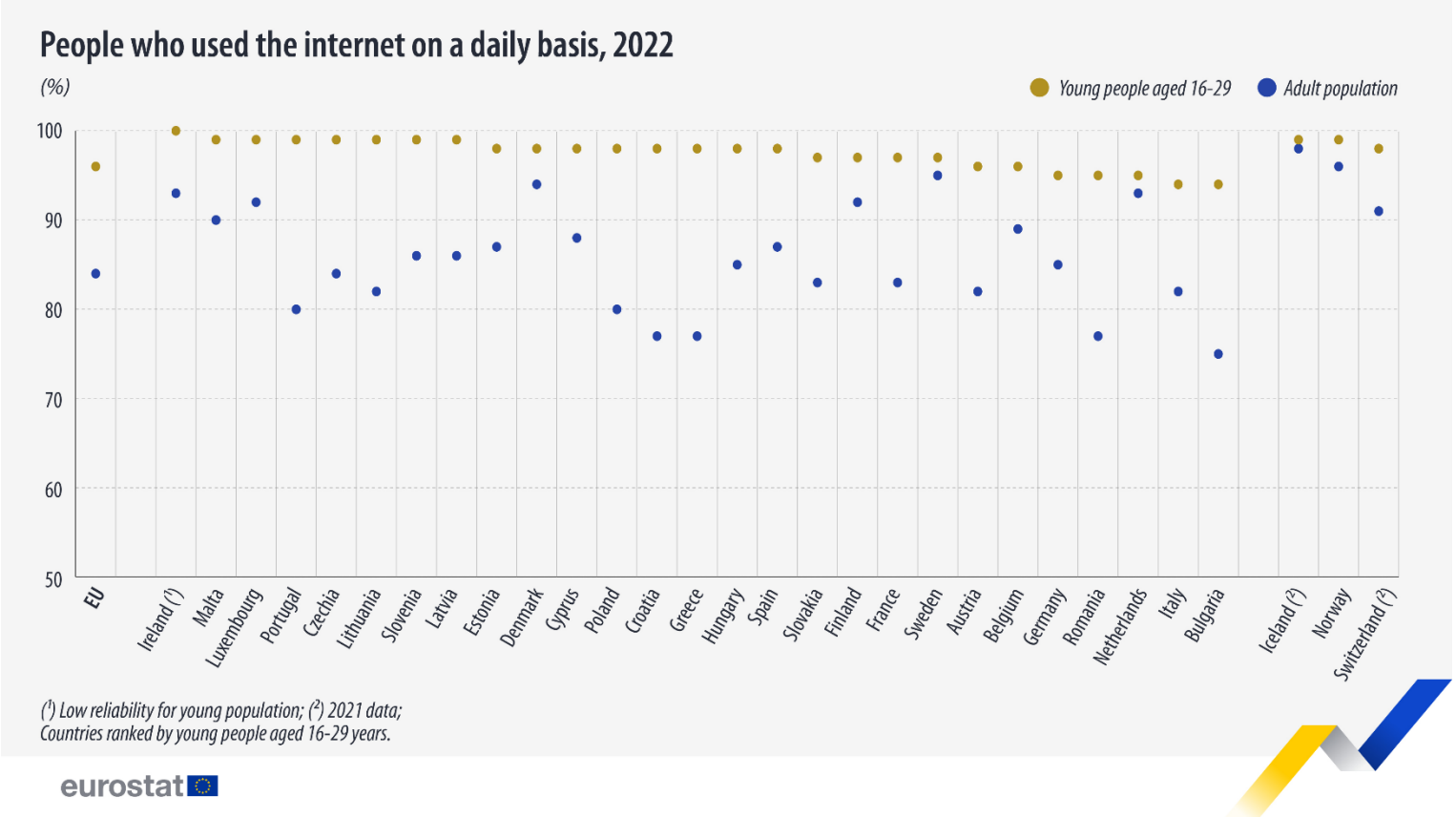

Figure 3: People who used the internet on a daily basis,2022. By Eurostat, 2022.

2.3 Mobile Technologies in Tourism

A paradigm shift in the tourism industry was brought about by the advent of the new Information and Communication Technology (ICT) age. The development of the travel and hospitality industries has been affected by the disruption of digital technologies (Khatri, 2019). The progress of modern technologies has caused several transformations in the tourism industry. These changes may be seen in both the tourism supply and demand. Technology has evolved around mApps and web environments, which are being used to extend to a large consumer population worldwide. Mobile apps are becoming essential in pre-trip travel preparation, making decisions, and sharing tacit information (Khatri, 2019). ICT adoption is also providing tools for globalization, clustering, teamwork, and the development of a critical mass (Khatri, 2018). As a result, the adoption of IT has a variety of implications for tourism by altering the competitive landscape.

These two closely associated industries, tourism and hospitality, are heavily utilizing ICT technologies more and more every day. It is utilized to enhance communication between travelers, travel companies, and service suppliers for travel (Khatri, 2019). An obvious portion of the tourism and hospitality sector is currently being implemented in various touristic locations, hotels, transportation, and other related service providers. Nowadays, e-tourism and digitalized tourism and hospitality activities such as bookings on the Internet, travel blogs, e-tour guides, and online service platforms are popular. It is undeniable that technological advancements are influencing how people travel and their experiences (Dorcic et al.,2019). Khatri's study (2019) analyses 64 research articles published in the last 10 years to assess the concept of IT in the tourism and hospitality sector to comprehend the underlying

objective, internal company processes, value creation, and competitive advantage. The outcomes have shown that people utilize mobile and information technology extensively in tourism and hospitality to search for, share, and exchange information. People use apps as a primary information source (Duan et al.,2015) as new technologies make it simple to obtain an extensive range of tourism information (Rodriguez et al., 2012). Smartphones and other mobile devices have altered the tourism business, and travelers' ability to obtain information during their trip will continue to develop as they are utilizing these devices during their trip (Jung et al., 2015).

The rate of competition in tourism and hospitality is always high. There are too many members in the sector forming this intense competition, and several destinations are competing with one another to attract tourists (Khatri, 2018). In such cases, promoting and marketing tourism and hospitality products and services are very important. The impact of psychological distance on consumers' preferences for promotional material, according to Kim et al. (2016), is significantly influenced by informational media (textual vs. graphical). The usage of ICT enables universal and varying patterns of interaction in destination marketing (Choi et al., 2017). Virtual reality, augmented reality, the Internet of Things, and artificial intelligence have become more widely used as marketing techniques across many sectors (He et al.,2018). Figure 4 shows the percentage of tourists worldwide who expect to utilize specific trip planning tools in 2033 as of August 2022. Outcomes show that people will be mostly demanding apps that have everything a consumer may need to plan their trip. Virtual reality and augmented reality tours also have a significant percentage. People are also referring to websites, price comparison pages, and social media as the popular tools of travelers in the future.

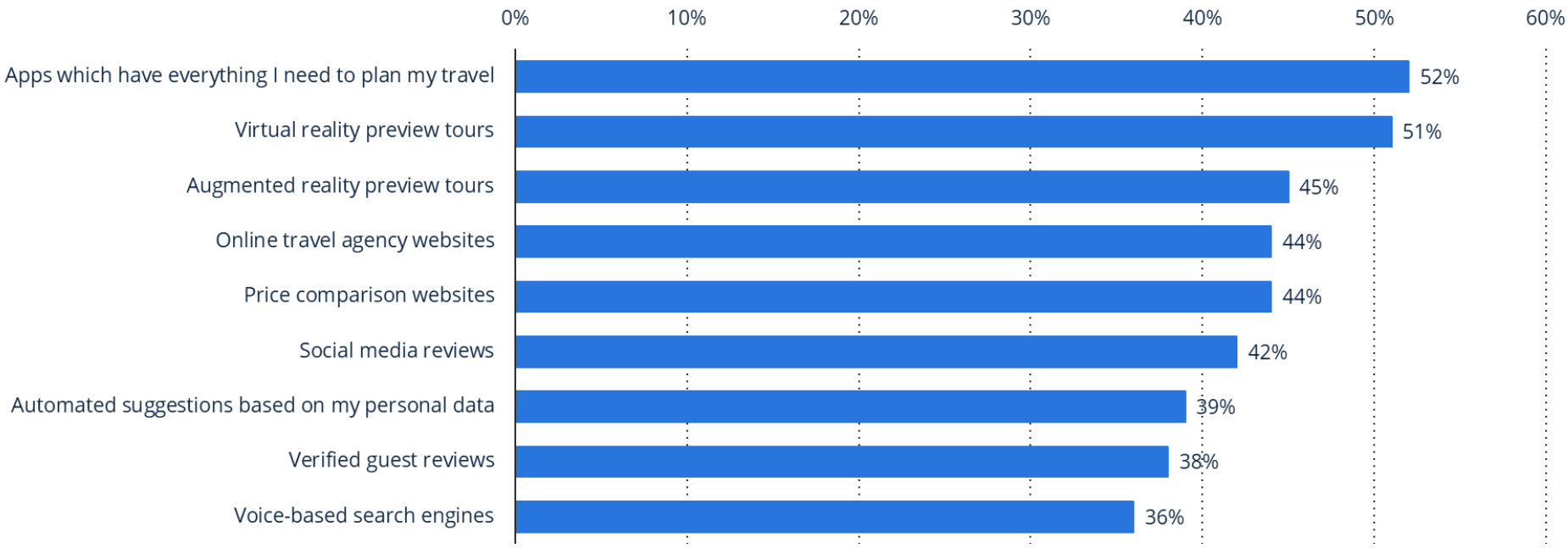

Figure 4: The percentage of tourists worldwide who expect to utilize specific trip planning tools in 2033 as of August 2022.

Sharing information and displaying content is not sufficient for users but the services provided over the mApp are helping to gain more attention from the users. Figure 5 shows the global average retention rate of travel, tourism, and hospitality apps in 2022. The retention rate is the percentage of users who keep using an app after downloading it. According to a 2022 study, hospitality and tourist apps had a 57 percent average retention over 30 days (1 month), a 46 percent average retention over 90 days that year, and a 34 percent average annual retention rate in 2022 (Alchemer, 2023). This shows that mApp engagement and intention to continue using the application must be achieved within the first 30 days to preserve its usage. This can only be achieved by providing compatible, beneficial, and unique services which will enhance users' satisfaction and help maintain the connection. An important way mApp has linked to consumers is through reviews and ratings of services. Many websites and applications are offering this feature as an important tool to get direct feedback from consumers instantly regarding their experience, overall quality, and user satisfaction. Figure 6 shows the global average amount of travel, tourism, and hospitality app reviews in 2022. People value sharing and reading other comments in the decision-making process. They can also refer to the reviews before, during, and after their trip and easily share their own comments which are influential by travelers in the decision-making stage.

Another important use of technology in the tourism and hospitality field is regarding behavior and performance analyses (Khatri, 2019). It is rather important to understand the consumer and purchaser motives, habits, and behavior when using tourism applications, websites, and other sources.

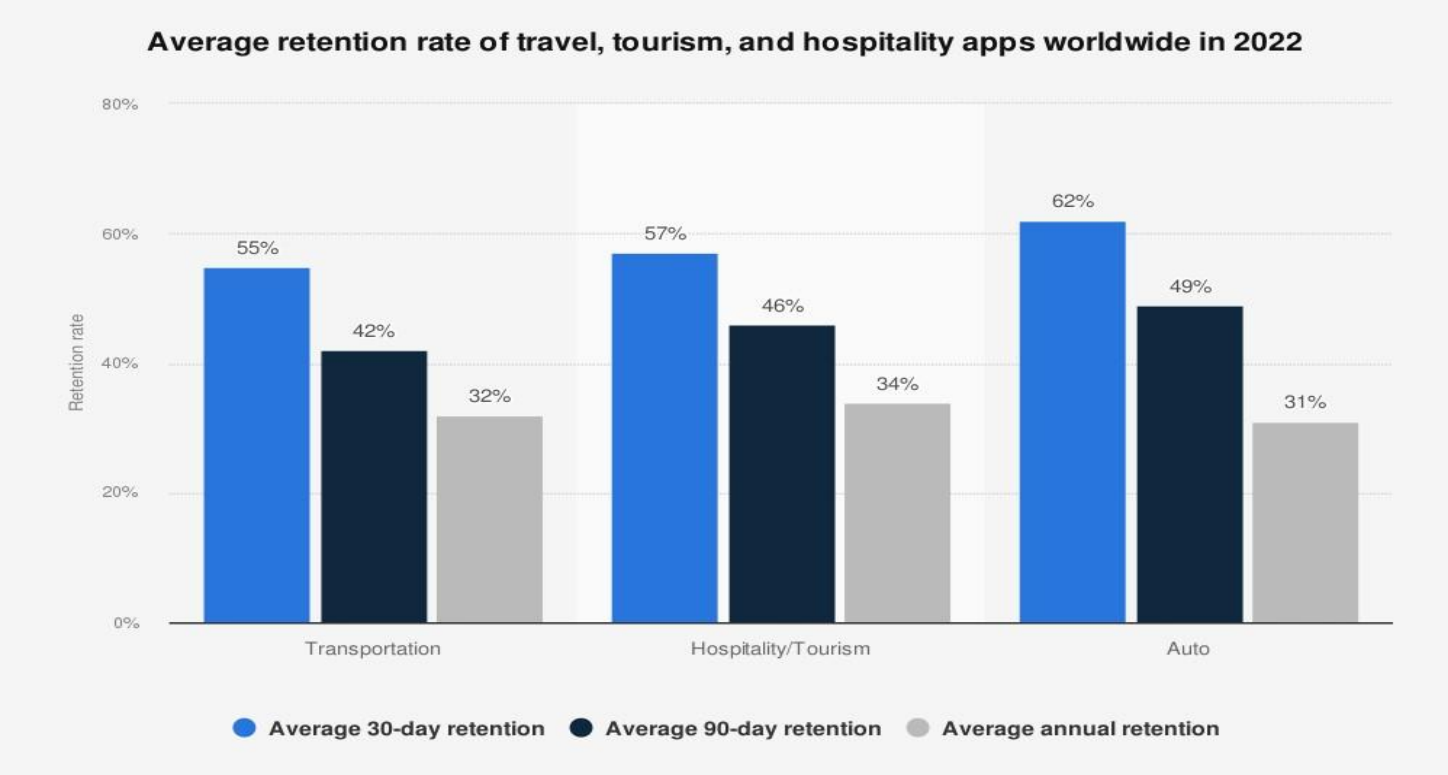

Figure 5: The global average retention rate of travel, tourism, and hospitality apps in 2022.

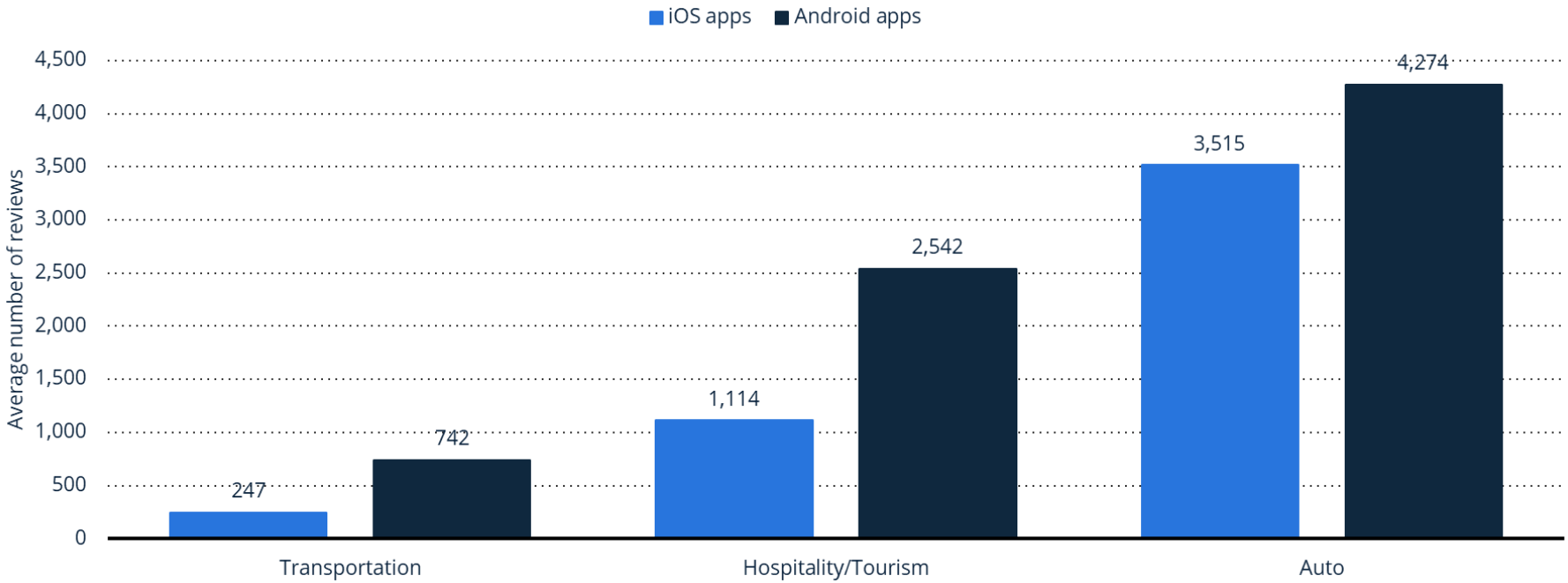

Figure 6: The global average amount of travel, tourism, and hospitality app reviews in 2022.

Prior studies have concentrated on planning employees' acceptance of new ICT (Cheng & Cho, 2010), understanding perceptions of tourists (Choi et al., 2018), identifying tourist activities as well as time preferences (Vu et al., 2018) or examining the determinants of purchasing products and services (Escobar-Rodriguez et al., 2014). The investigation of people's behavior concerning information technology is an increasing trend in the travel and hospitality sectors. Xiang et al.(2015) researched how consumers have adapted to using the Internet over time and how they use it for planning their trips. Ying (2014) examined the interaction patterns of various tourism stakeholders. Sanders and LeClus (2009) examined the expectations and experiences of tourism marketing students with lecture podcasting. No and Kim (2014) studied the factors that determine how travelers use their smartphones to access travel information. They found that usefulness, usability, social influence, and contentment with travel websites were important determinants. The prior studies lacked newer mApp features and the important determinants that may influence users' satisfaction and perceived value, leading to a long-term commitment and engagement with the mApp.

2.4 Theoretical Framework

2.4.1 Diffusion of Innovation Theory (DOI)

Various theoretical models have been developed to explain different aspects of technological innovations, such as the important factors that make up the innovation, the adoption and acceptance of an innovation, and how these innovations influence society. Many researchers have used Innovation Diffusion Theory (DOI) to understand in what way, for what reason, and to what degree new ideas and technologies extend among users. The theory's main point is about understanding the individual's thoughts, senses, and experiences about innovation. Rogers (1983) DOI offers a theoretical basis to explain the characteristics influencing a user's mApp engagement and continuous

use. The innovation diffusion theory explains which innovation features help the adoption of that innovation by the user (Kim et al., 2020). When we look from the consumer's perception, innovation acceptance is not compulsory; it is based on an individual's interest, choice, and attachment to the current technology (Antón et al., 2013), or a person may accept using the innovation to increase their benefit or enjoy their overall experience of using a different technology. The consumer may reject an innovation due to the fear of not adapting to the innovation or having a less emotional attachment to the current technology. As every person is different, their perception of innovation is also expected to be different.

DOI is a suitable framework for analyzing tourists' online usage (Agag & El-Masry, 2016). This framework can analyze the consumers' emotional reactions towards mApps to understand what positively influences the consumer, increasing the likelihood of users' engagement with the mApp and intention for continuing use. According to the DOI, innovation characteristics and self-efficacy affect the innovation's acceptance rate (Kim et al., 2020). For example, the strong connection of e-readers to hardcopy books, as well as their compatibility with reading styles, have a detrimental impact on e-book adoption (Waheed et al., 2015). Customers' adoption of information technology, smartphone banking, and mobile tourism websites is mostly motivated by simplicity, compatibility, and relative advantage (Kim et al., 2020).

2.4.2 Simplicity

One of Rogers's DOI theory characteristics simplicity supports when adopting a new idea or innovation. Simplicity is defined as the degree to which an innovation or technology is perceived as easy to understand and use (Rogers, 1983). Rogers also suggests that if an innovation has complexity, potential adopters may not fully comprehend its functionality; this may prevent the innovation from being easily

adopted and used. According to studies, if technology is simple to understand and utilize, its acceptance and innovation will spread more and become diffused among consumers more quickly (Kim, 2021). Jun et al. (2018) followed Cho and Sagynov's (2015) interpretation of simplicity as ease of use. They confirmed the positive impact of ease of use (simplicity) on perceived value, a finding consistent with previous research of DeLone and McLean (1992). Tran Le Na and Hien (2021) also used Ko et al.'s (2009) statement regarding ease of use impacting perceived value in adopting technology. This statement supports Venkatesh et al. (2003) declaration that ease of use (simplicity) is an important prerequisite for perceived value in accepting new things.

Similarly, Verkijika and De Wet's (2019) study supports simplicity as having an important influence on forming perceptions of a system's ease of use and impacting users' satisfaction with the system. Several researchers' empirical evidence supports this viewpoint. Choi et al. (2012) discovered a significant positive relationship between smartphone user satisfaction and simplicity. Eytam et al. (2017) support simplicity in shaping user attitudes, which turns into a positive attitude leading to user satisfaction if the system is free from complexity.

According to the DOI theory, one of the most influential factors in consumers' adoption of an innovation is its simplicity. Kim et al. (2020) posits that simplicity is a crucial characteristic of innovation associated positively with user adoption. Users' positive experience with the mApp has a significant association with its simplicity and ease of use, resulting in increased satisfaction. Therefore, we expect simplicity to enhance perceived value and user satisfaction positively. Hence, the following hypotheses were constructed:

H1. The simplicity of the mApp positively influences its perceived value.

H2. The simplicity of the mApp positively influences user satisfaction.

2.4.3 Benefit

According to Rogers' notion, innovations must offer a clear and apparent advantage over the previous approach (Rogers, 1983). These innovations will be easier to adopt and implement. Relative advantage can help determine how a person perceives a new concept or invention (Ali et al., 2019). People will adopt an innovation when it is thought to be more beneficial, for instance, enhancing effectiveness and efficiency (Min et al., 2019). Consumers will evaluate the mApp's benefit in comparison to the previous applications, websites, or other technologies to make similar transactions. Within the DOI theory, Rogers (1995) supports that relative advantage (benefit) is one of the main elements of innovation. Wang (2014) further argued on this statement that mobile technology's convenience positively influences its perceived value. Lin et al. (2020) followed Kim et al. (2016), Wang (2014) and Yang et al.'s (2016) collective interpretation of benefit, confirming that it positively affects perceived value. Prior studies as Kleijnen et al. (2007) and Yang et al. (2016) support smartphones' benefit, stating that timely and effective delivery of services helps to bring value to mobile with such value-added services. In this study, mApp's benefits are considered in terms of its efficiency, the practical solution it provides for consumers, and the reliability of its services. Wang (2014) further argued that mobile technology's convenience (benefit) positively affects perceived value.

Lee and Shin (2018) analyzed the key characteristics of a smartphone influencing user satisfaction, and they have referred to benefit as a relative advantage. The study cites Rijsdijk et al.'s (2007) research findings that support relative advantage (benefit) to

impact user satisfaction positively. Rogers (1995) also insisted that a product's relative advantage (benefit) is a source of satisfaction when outlining the key characteristics of his theory. Tran Le Na and Hien (2021) follows Aji et al.'s (2020) analyses that the advantages of technology influenced both the intention to adopt e-wallets and customer satisfaction and referred to Hsu et al.'s (2010) statement that the greater the benefits, the higher the perceived value and satisfaction. These statements indicate that the benefits of mApp may influence perceived value and user satisfaction. Thus, the following hypotheses are proposed:

H3. The benefit from mApp positively influences its perceived value.

H4. The benefit from mApp positively influences user satisfaction.

2.4.4 Compatibility

The study also considers compatibility an influential element in adopting and using technology. Compatibility is another key variable of Roger's DOI Theory. According to Roger's theory, compatibility relates to how well innovation fits with existent values, beliefs, habits, and present and past experiences (Rogers, 1983). Compatibility can be assessed over the current users' life cycle of innovation and relate to post-use confirmation and satisfaction (Lee et al., 2021). Prior studies state that customer adoption behavior is primarily connected with their expectations, values, and beliefs about innovation (Ali et al., 2019). If the mApp meets the expectations and values of the consumer, they will probably be willing to use it. Lin et al. (2020) use Lin and Lu's (2011) interpretation regarding compatibility with mobile applications, referring to the fact that consumers get the same service functionality online as they would get offline while utilizing PCs or cell phones to browse community websites. Lin's study emphasizes Kleijnen et al.'s (2007) statement about consumers using mobile value-added services to meet their specific needs; compatibility at this level refers to the

degree to which these services meet the consumers' requirements. He supports that when the consumers' service needs are fulfilled, their perceived value towards the mobile service increases, as proved in the study results.

Lee and Shin (2018) refer to Rijsdijk et al. (2007), who have continuously studied consumers' behavior towards different inventions, including smartphone technologies. They investigated the relationship between user satisfaction and the DOI theory constructs, and their findings support that compatibility positively impacts consumer satisfaction (Rijsdijk et al., 2007). The findings showed that both DOI variables, relative advantage and compatibility, showed a positive impact on consumer satisfaction. Prior studies reveal that a higher level of compatibility will have a more positive impact on perceived value (Kim and Ammeter, 2014). Puspitasari et al. (2021) study utilizes DOI variable compatibility, which confirms a positive correlation with satisfaction. This study aims to develop a clear understanding of the role of compatibility of tourism-based mApps towards forming a positive perceived value and user satisfaction. Hence, proposing the following hypotheses:

H5. The compatibility of the mApp positively influences its perceived value.

H6. The compatibility of the mApp positively influences user satisfaction.

2.4.5 Uses and Gratifications Theory (UGT)

UGT is an approach to understanding what triggers individuals to use specific communication channels to satisfy their requirements actively. The theory emphasizes social communication. The theory serves mainly in the field of communications and media and supports that the media's most vital objective is to satisfy the needs and incentives of the audience (Mehrad & Tajer, 2016). The theory assumes that the audience is not passive during media selection (Katz et al., 1973). Not being passive means that consumers are aware of their selection. They have an active response or

resistance towards their selection and can define their emotional desires more accurately when accepting one selection and rejecting the other. The UGT can describe how media is used to satisfy the needs of people with various objectives (Kim et al., 2020). UGT is that it aids in understanding the motivations behind consumers' intentions, values, or satisfaction when using social platforms, media technology, and web-based or mobile services (Geng et al., 2023). This study will analyze the determinants of user satisfaction and perceived value based on the three original dimensions of UGT, namely informativeness, social interaction, and playfulness of the mApp experience. A sample was explained for virtual network games where the theory helped explain the ongoing desire to play with the games (Li et al., 2015). The theory proposes that hedonic, mobile, and integrated convenience gratifications impact users' attitudes, leading to using the subjected communications channel (Ha et al., 2015) and potential travel (Kim et al., 2019).

There are many reasons a person would use an mApp, including data gathering, playfulness, social interaction, and spending free time. Gallego et al. (2016) declared that the uses and gratifications model explain how gratifications influence consumers' engagement and intention to use virtual reality for knowledge. Consumers engage in virtual reality tourism activities to meet their information needs, social interaction, and playfulness (Kim et al., 2019). This study will discover whether a tourism-based mApp's informativeness, social interaction, and playfulness influence the consumer's engagement with the application and continue to use it.

2.4.6 Informativeness

Among the gratifications, informativeness is considered to be the most important element because consumers need to fetch for a travel destination or plan a trip mainly with an information-acquiring purpose; for example, the need of the consumer

motivates the planning of a trip, following which the consumer searches for information, compare several possibilities, and finally makes a precise selection. Orden-Mejía and Huertas (2022) followed Li and Mao's (2015) interpretation of informativeness as the ability to deliver appropriate data effectively. Mapp informativeness is about the quality, relevance, and trustworthiness of the consumer's information to help them find a destination and make a plan or reservation. Prior studies mostly state the value of informativeness in online advertisement. Aydin and Karamehmet's (2017) study convey that to be valuable to the target, the information offered in advertisements should be timely and relevant; according to this, the importance of informativeness in producing value for consumers is widely acknowledged. Orden-Mejía and Huertas's (2022) study supports Yen and Chiang's (2021) statement that informativeness positively affects consumers' trust in chatbots, and user satisfaction is increased when information is of high quality (DeLone & McLean, 1992). Veeramootoo et al. (2018) also support that correct, complete, and current information plays an important role in users' satisfaction. The satisfaction of the consumer is significantly impacted by knowledge and experience sharing when traveling via mApps or digital platforms (Geng et al., 2023). The study comes to a general view regarding the help informativeness brings consumers while planning their trips. It forms satisfaction, positive perception, and value of tourism technologies. Hence, the following hypotheses were constructed:

H7. The informativeness of the mApp positively influences perceived value.

H8. The informativeness of the mApp positively influences user satisfaction.

2.4.7 Social Interaction

Social interaction is another important element of UGT. This study will refer to how the consumer may use mApp as a social environment to interact with other consumers.

Zhang et al's (2017) study supports Jacobs's (2016) view that social interaction is key to enhancing a community's sense of trust, cooperation, and collective actions. In mApps, social interaction includes sharing user reviews, comments, and ideas about vacation places. Consumers would feel more content if they could ask questions of other consumers and receive their opinions. Referring to Lin and Lu (2011), and Wang and Chen (2012) statements about social interaction positively influences shared value, trust, and continuance intention to use social networking services, Zhang et al. (2017) support that enhanced interactivity among consumers increase perceived value for such services. Bae's (2018) confirmed that social networking service users feel deep contentment when they perceive having met others or getting advice from others. It appears that social connections impact people's satisfaction since they can help meet some of the needs of consumers through innovation (Geng et al., 2023). Therefore, the following hypotheses are proposed:

H9. Social interaction of the mApp positively influences perceived value.

H10. Social interaction of mApp positively influences user satisfaction.

2.4.8 Playfulness

Playfulness is another type of gratification that touches the consumers' emotions and feelings. Ma et al.'s (2019) study highlights Bae (2018) and Li et al.'s (2015) fact about UGT, supports that social-, information-, and entertainment (playfulness)-associated needs impact user satisfaction. The study implies that user satisfaction triggered by social information and enjoyment may affect user stickiness and continuing intention to use/stay at the subject platform. Ma et al.'s (2019) study supports social reasons (social interaction) and those related to information (informativeness) and enjoyment (playfulness) to be the predictors of user satisfaction. Lin and Bautista's (2020) study demonstrates that computer media providing entertainment and enjoyment positively

affects consumers' moods. In the advertisement field, if the advertisers fulfill the user's entertainment (playfulness) needs, they can help increase loyalty and perceived value to their brand (Lin & Bautista, 2020). Singh et al's (2021) study extended the perceived value theory by analyzing the determinant factors and stated that perceived enjoyment (playfulness) is one of these determinants. He highlights that according to findings from research on US consumers, perceived enjoyment (playfulness) is a major predictor of perceived values and behavioral intention. Lin and Bautista's (2020) study highlights that entertaining content in media is a significant predictor of value in Internet advertising and mobile advertising. Playfulness measures how much hedonic value consumers derive from innovative content, and it is a powerful factor in explaining consumers' satisfaction (Geng et al., 2023). Taking these facts into account, the following hypotheses are constructed;

H11. The playfulness of the mApp positively influences its perceived value.

H12. The playfulness of the mApp positively influences user satisfaction.

2.4.9 Perceived Value Influence on mApp Engagement and Intention for Continuing Use

Consumer perceived value has been used as a marketing term in many research studies, reflecting how a consumer views a product or service. This view may result in success as well as failure depending on the consumers' expectations or meeting demand for that particular product or service. Perceived value is important as it results in a conclusion where the consumer will decide whether they are willing to obtain and continue using the product or service. El-Haddadeh et al.'s (2019) study follow Zeithaml's (1988) interpretation of perceived value being assessed by the consumers' amount of 'give and take' involved in the process. His findings use Dodds et al.'s (1991) statement, which evaluates the give and take as non-monetary and supposedly

in terms of the time and effort invested in using the product or service. El-Haddadeh et al.'s (2019) statements are similarly supported in Kim et al.'s (2018) study on the value of mobile services as perceived by consumers. His research refers to Pihlström's (2008) study, where perceived value is assessed by convenience value and the effective and efficient pace at which a goal or job is completed. The study highlights the approval of Kim et al. (2013) and Kim et al. (2016) findings about perceived value becoming an activating source for mobile engagement and intention for continuing use. Perceived value is also examined in the marketing field. A study by Itani et al. (2019) uses Parasuraman and Grewal's (2000) findings that perceived value supports pre-purchase and post-purchase stages in which satisfaction and repurchase occur. The research draws attention to Maslowska et al. (2016) statement about the overall experience's positivity, leading customers to be more engaged in the effort to market the service brand. This effect also lies in the ability to prevent consumer switching behaviors, according to Chiu et al. (2014) findings. Itani et al. (2019) research outcomes supported his claims within the restaurant industry, showing that customer-perceived value had a significant positive impact on customer engagement.

Another research regarding wellness tourism by Xie et al. (2021) claims that consumer engagement comes from an interactive experience and values co-creation process and will influence consumer behavior toward a product or service. Xie et al.'s (2021) research findings on wellness tourism confirmed the direct positive influence of consumers' perceived value on consumers' engagement, indicating that the higher the perceived value, the more the degree of engagement, which is considered a valuable asset for the service providers.

Prodanova et al. (2019) study on m-banking applications has investigated the effects of perceived value, specifically on adopting and continuing to use an application. The study uses Kuo et al. (2009) research findings where perceived value positively influenced behavioral intentions in mobile services, particularly in the intention to continue using the mobile service. Other studies by Farah et al. (2018) and Karjaluoto et al. (2019) regarding m-banking services have confirmed the positive impact of perceived value on consumers' adoption and usage intentions. Prodanova et al.'s (2019) hypothesis for consumers' intention to continue using m-banking is positively influenced by perceived value. Therefore, the following hypotheses are proposed accordingly;

H13. The perceived value of the mApp positively influences mApp Engagement.

H14. The perceived value of the mApp positively influences the Intention for Continuing Use

2.4.10 User Satisfaction Influence on mApp Engagement and Intention for Continuing Use

User satisfaction has been a research topic since technology and information systems were introduced. It has consistently been one of the top research agendas and frequently measured constructs. User satisfaction has been used as an indication of the user's perceptions of the effectiveness of the introduced technology or service. Many studies have used user satisfaction as a measuring construct with different antecedents, which may change according to the technology. This study will use utilitarian and hedonic characteristics of mApps, which bring satisfaction that will enhance mApp engagement and intention to continue use.

Pang's (2021) study has evaluated the effect of satisfaction on eWOM engagement. His prior research has been in line with his findings, confirming that satisfaction with

WeChat usage positively impacts eWOM engagement. Pang has also referenced numerous studies that have analyzed social media services and discovered that future behavioral intentions of users, such as purchase decisions, intention to spread positive word of mouth, and desire to promote the application were impacted by satisfaction.

Kim et al. (2013) research on mobile user engagement draws attention to satisfaction outcomes and how they may relate to mobile engagement and intention to continue use. Their article refers to Jones et al. (2004) and Kahn's (1990) statements that satisfaction with a mobile device brings value. This sentence may also come to the similar meaning that satisfaction will reduce the likelihood of disengagement and turnover intention. Kim et al. (2013) highlights the necessity of satisfaction as an important factor for successful smartphone user engagement, influencing user consumption choices. His findings supported that smartphone user satisfaction and perceived value had positively influenced users' engagement and intention to continue using the smartphone, which leads to an understanding that the more the consumer is satisfied with the mApp, the more likely they are to engage and continue using it. Hence, proposing the following hypotheses:

H15. User satisfaction with the mApp positively influences mApp Engagement.

H16. User satisfaction with the mApp positively influences Intention for Continuing Use

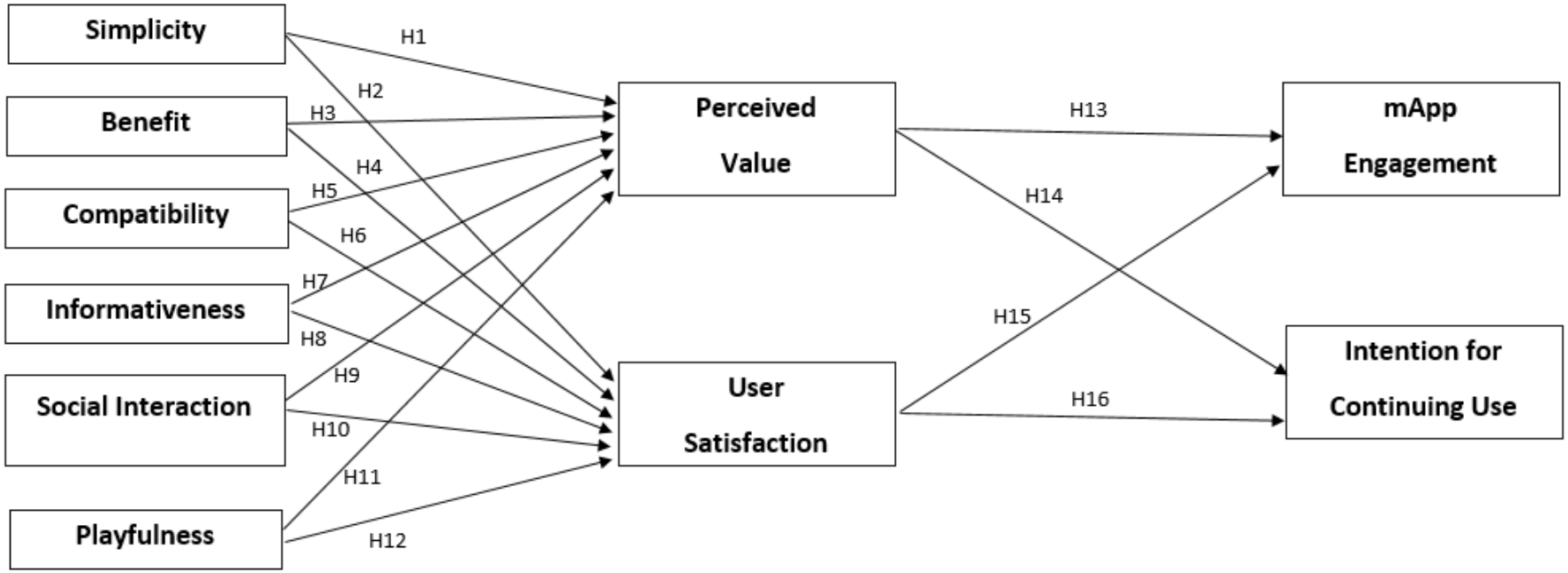

Figure 7: A research model for the study

2.5 About European Tourism Industry

The study target area is selected as Europe. With the high population and a large number of mobile technology consumers' the study will have a better understanding of the consumers' perception of various mApp features. It is best to understand the nature of the tourism industry in Europe and the habits of its travelers. Europe leads the world in international tourism, accounting for nearly two-thirds of all foreign visitor arrivals globally as you can see in Figure 8, showing for the years 2005 to 2022, the number of foreign tourist arrivals worldwide, grouped by region. Although there was a general decrease due to the pandemic, Europe still received about 594.5 million arrivals in 2022, making it the continent with the largest volume of inbound tourists.

For this reason, Europe has a large proportion of tourism service providers and consumers, affecting the overall economy of Europe. In 2019, the 'travel and tourism' sector generated 3.9% of EU GDP and employed 5.1% of the total labor force (which equates to some 11.9 million jobs) (Europarl, 2023). Figure 9 shows, from 2019 to 2021, the total contribution made by travel and tourism to European GDP (in billion U.S. dollars). Also In 2019, there were 1.5 billion international tourist arrivals globally (+4%), with 745 million, or 50% of the market, in Europe. The biggest threat to the tourism industry's future is the COVID-19 pandemic outbreak in March 2020, with its ensuing uncertainties over travel restrictions and sanitary requirements.

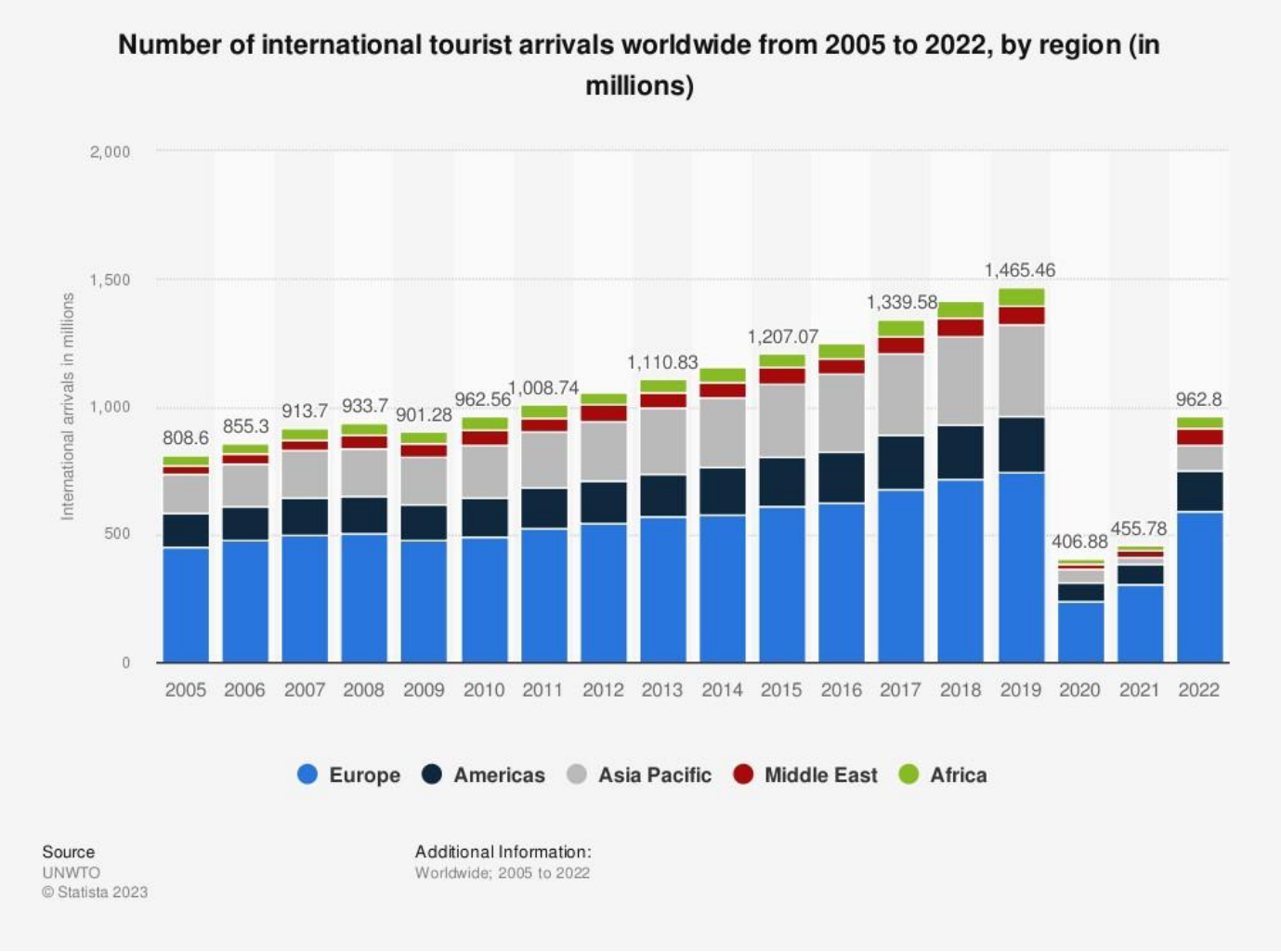

Figure 8: Number of international tourist arrivals worldwide from 2005 to 2022, by region(in millions)

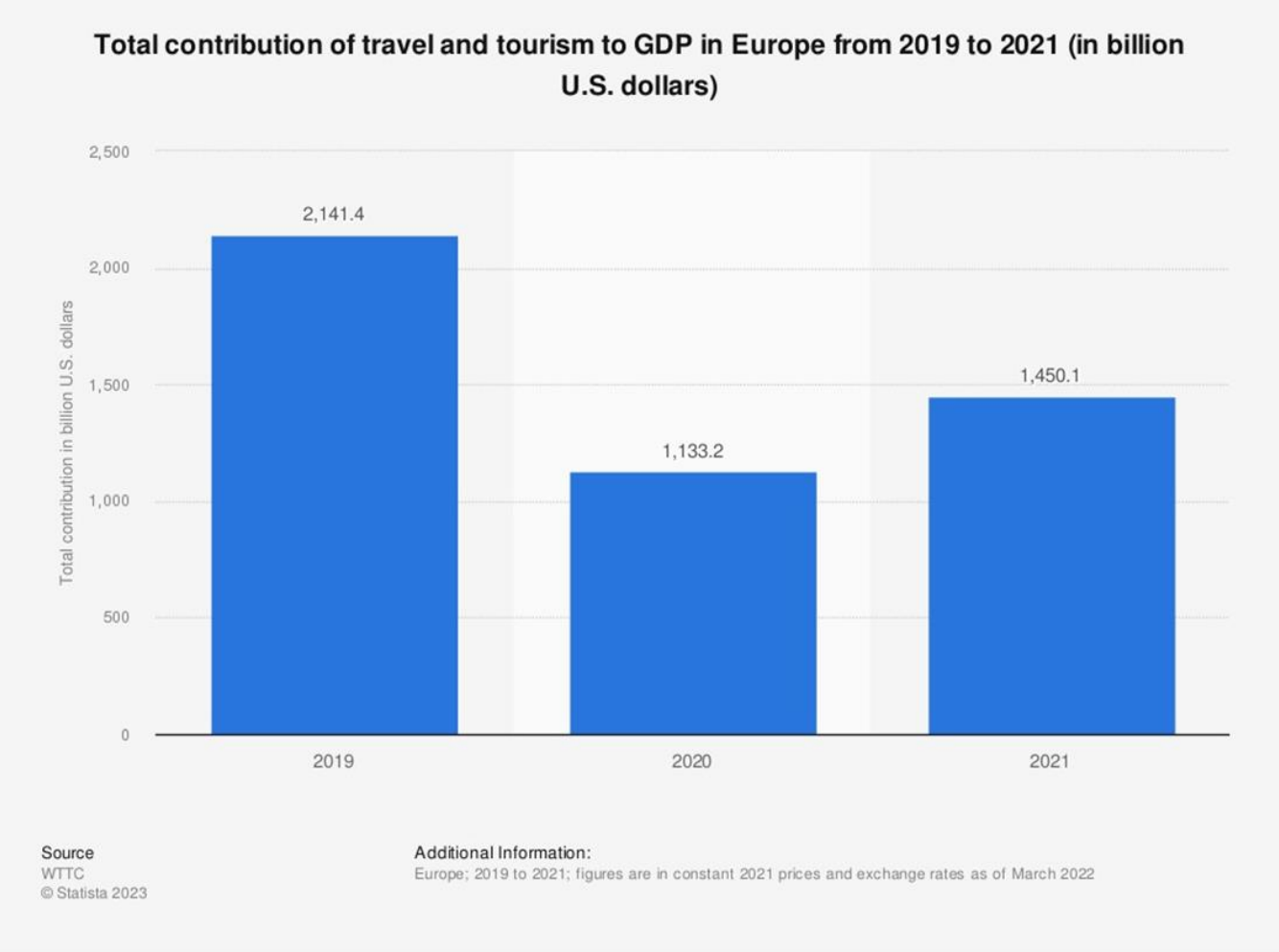

Figure 9: From 2019 to 2021, the total contribution made by travel and tourism to the European GDP (in billion U.S. dollars).

Service providers are taking new initiatives to gain significance over time. There are new projects involving sustainable, responsible, and ethical tourism. The European Commission suggested an operational framework and initiatives to enhance the EU tourism industry in a message titled ‘Working together for the Future of European Tourism’ (COM, 2001). Attempting to elevate Europe as a prime travel destination, which involved gathering both public and private participants in the EU tourism business to carry out a variety of initiatives. Some of these initiatives include promoting competitive and long-term growth in the industry (2017), encouraging, and creating sports and wellness products and services as well as assisting in the preservation of Europe’s cultural and industrial legacy (2015), enabling EU tourism movements for elder and younger people in non-busy and medium-busy seasons (2014) (COSME, 2018). These new measures have brought new interest and an aim to boost tourism rates higher, prompting more people to travel to Europe from abroad and offer opportunities for its citizens who would like to travel around Europe.

Consumer habits have also changed over time. European visitors preferred domestic and surrounding locations over countries beyond Europe, according to a study in 2022, as in Figure 10. As of May 2023, 26 percent mentioned planning a visit within their own countries, about 30 percent of people intended to travel to a nearby European destination or a country within Europe, and 29 percent are planning to visit a non-neighboring European country in the next six months. Patterns have shown that most Europeans plan to travel on a non-peak month. They prefer to prevent the crowded seasons and look for reasonable prices by early reservations.

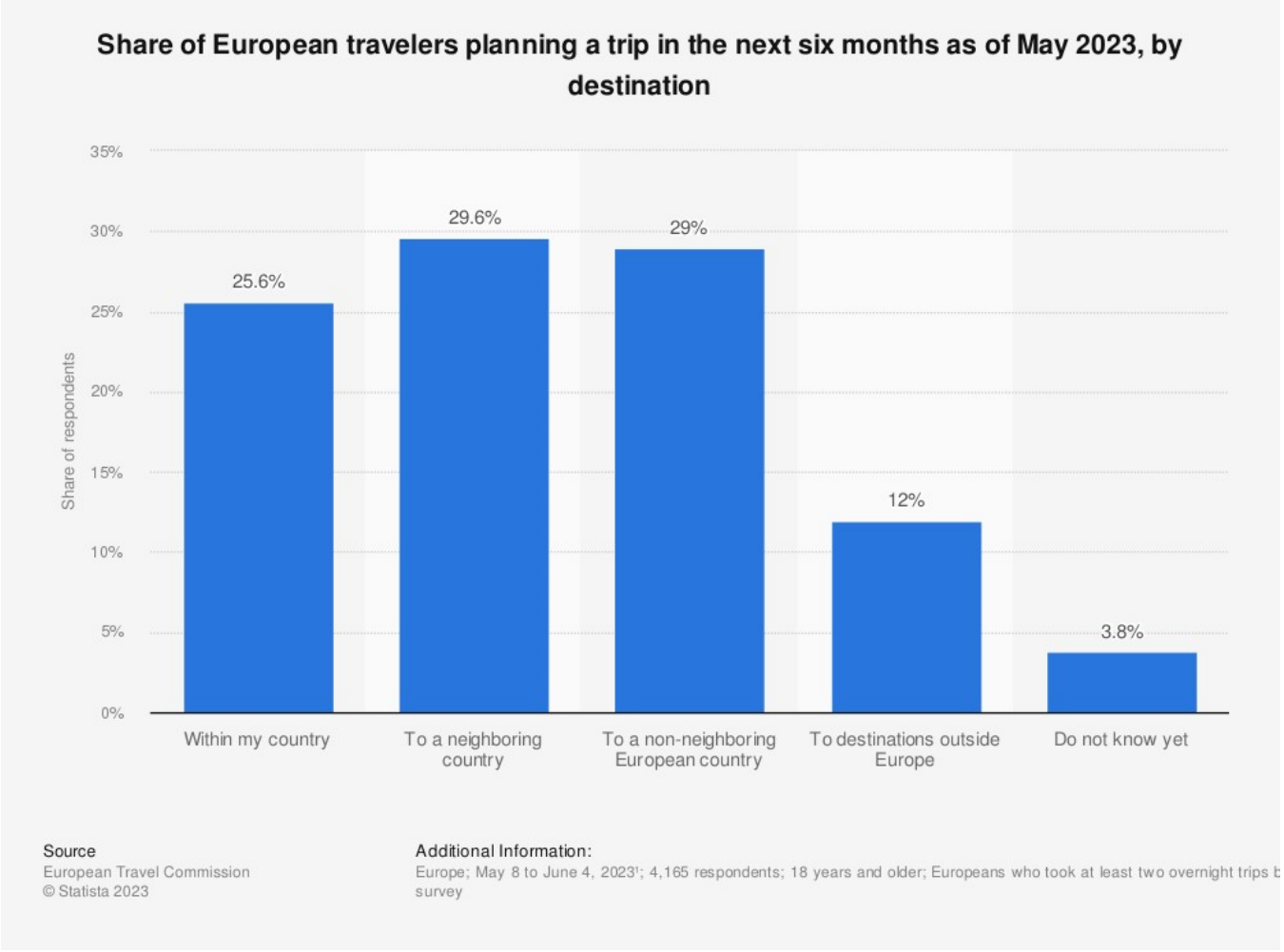

Figure 10: As of May 2023, the proportion of European tourists planning a trip in the following six months, by destination

In 2023, around 72 percent of Europeans planned to travel between April and September (ETC, 2023). According to the research, the primary reason for travel remains to be leisure (69%). Post-pandemic effects, increasing travel prices as a result of inflation, the ongoing conflict in Ukraine, and fears about catastrophic weather conditions all have an impact on Europeans' travel choices for spring and summer 2023 (ETC, 2023). The latest research on "Monitoring Sentiment for Domestic and Intra-European Travel – Wave 15" by the European Travel Commission (ETC) has highlighted the travel intentions and understanding of the preferences of European travelers. The findings confirm their prior study on the habits of travelers. People prefer spring or early summer vacations, trying to skip the crowded summer travels. Figure 11 shows the main concerns of European travelers in recent years. Early reservations are more favored recently since inflation and personal financial issues have led people to bid to secure lower prices. Other minor factors which have influenced travelers' habits and preferences are pleasant weather conditions prompting people when choosing a destination, followed by attractive bargains, and welcoming local communities.

Figure 12 demonstrates the proportion of European travelers intending on a vacation by their purpose. These statistics show that the main aim of taking a vacation is highly for leisure, recreation, and holiday. The tourism industry and service providers ought to consider these preferences and recently updating habits of travelers and try to make offers that will meet the expectations and demands of their consumers. A popular marketing and connection channel to these consumers would be through the means of mobile technology and tourism-based applications.

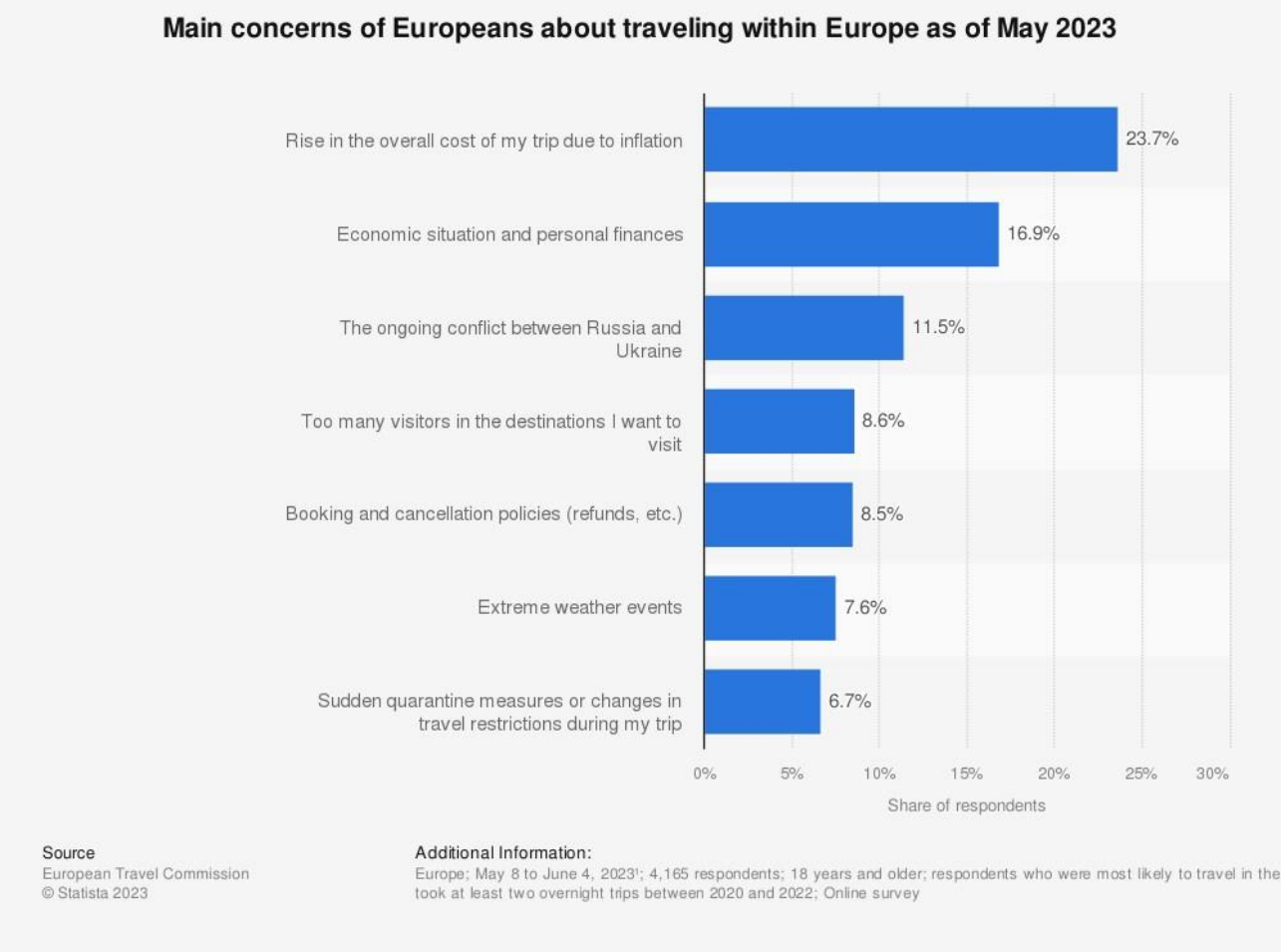

Figure 11: Main concerns of Europeans about traveling within Europe as of May 2023

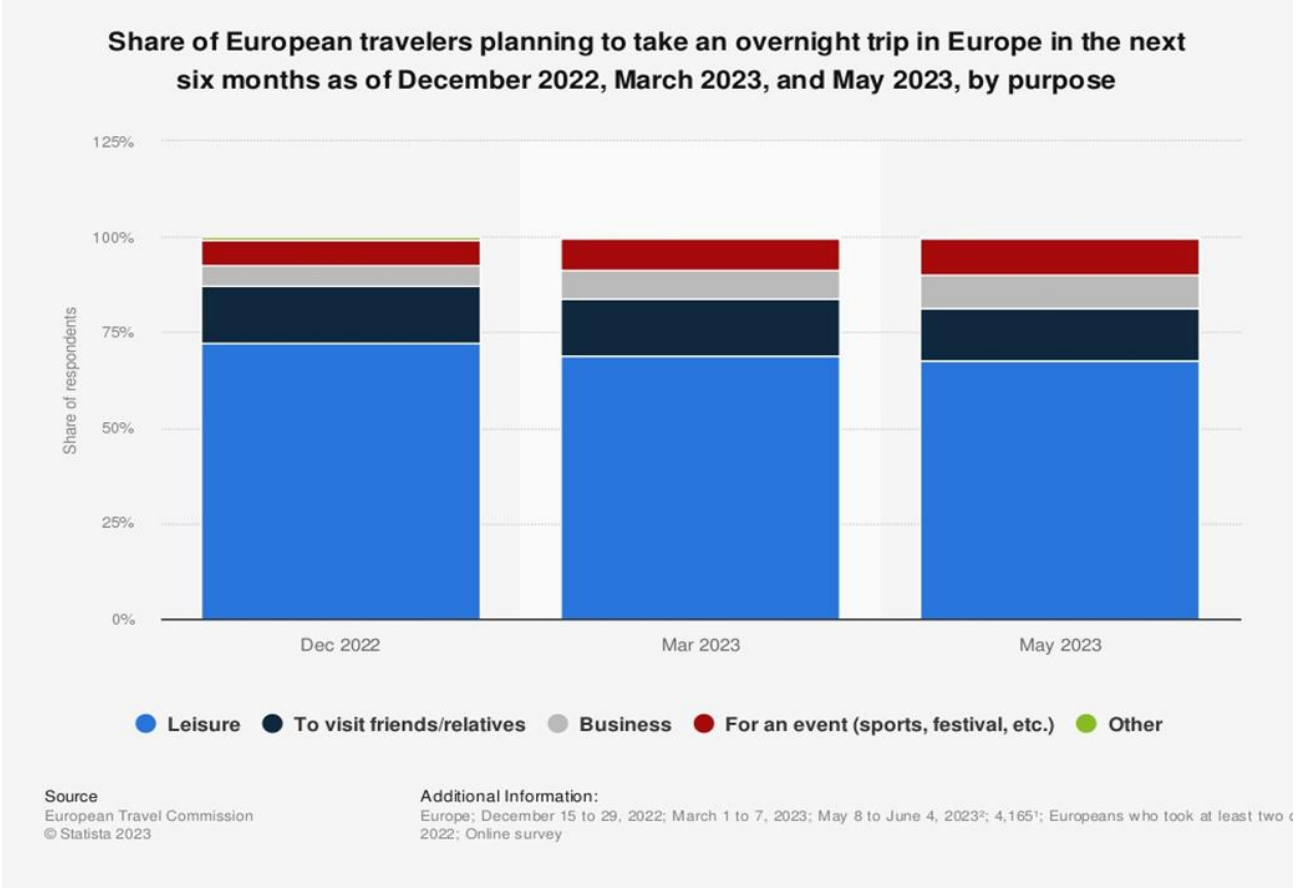

Figure 12: Share of European travelers planning to take an overnight trip in Europe in the next six months as of December 2022, March 2023, and May 2023, by purpose.

Chapter 3

METHODOLOGY

As it is indicated in the title, this chapter includes the research methodology of the dissertation. This research is motivated by the main purpose of studying the effect of various mApp characteristics, simplicity, compatibility, benefit, playfulness, informativeness, and social interaction, on mApp engagement and intention for continuing use. Compatibility, simplicity, and benefit are the attributes of innovation suggested by the DOI (Rogers, 1983), and informativeness, social interaction, and playfulness are the attributes of UGT that motivate an individual's continuous intention to use an innovation.

The study will analyze the significance of the six constructs in forming user satisfaction (SAT) and perceived value (PV). The study will utilize SAT and PV to test their significance on the dependent variables mApp engagement (ENG) and intention for continuing use (ICU) and to understand their influential effect as a mediator between the six constructs and the dependent variables.

The analysis for this paper utilizes a quantitative method along with a deductive strategy. The deductive approach supports hypotheses based on current theories (DOI and UGT) prior to developing a research approach to investigate such assumptions. It is the dominant research technique, where rules serve as the basis for explanation, allow for event prediction, and hence control. The deductive approach was used to

examine if the causal relationships of the research model given by a certain theory were valid. The first is to clarify the causal connections between ideas and variables. While looking into the reasons for mApp engagement and intention to continue use, the hypotheses can be developed to test if DOI and UGT constructs have any effect on these variables using perceived value and user satisfaction as mediating elements after finding this gap in the current literature. Consequently, this model will be assessed among European mApp users to collect measurable evidence to put this idea to the test. Finally, the last characteristic of the deduction is a generalization. To generalize, the samples were collected carefully to guarantee that they were of sufficient size (according to the population of Europe the required sample size was 384, the study collected more than 500 samples).

The purpose of this chapter is to discuss the research philosophy, research strategy, sample and population, instrumentation, data collection and data analyses. This section describes how the research outcome will be achieved in line with the study's objective.

3.1 Research Philosophy

"Research philosophy" is an approach to scientific investigation and refers to a set of presumptions and convictions about how new information is produced in the scientific community. It takes a lot of time and effort to conduct research to learn more about a topic. Regardless of how small a contribution it may be to knowledge, solving a specific issue of a problem still qualifies as new knowledge generation. At every level of an investigation, assumptions are made. Academics will encounter numerous instances of assumptions when conducting research. Preconceived ideas influence the study's objectives, procedures, and conclusions (Crotty 1998). It is challenging to establish a solid study approach without carefully considered and consistent

assumptions. Business and management research is highly dependent on philosophical commitments.

When choosing a specific method, there are many considerations regarding your research design, research process, planning on data acquisition, accessibility to the research area, and collecting the information required. To understand and choose the best method for research, it is important to know the philosophical concepts. According to many researchers all research conducted should be based on numerous philosophical assumptions (Alharahsheh & Pius, 2020). First, it starts with one's opinion about the study's subject. Second, a belief in the idea of knowledge. Beliefs as explored by regarding the relationship between knowledge and the empirical world (Orlikowski & Baroudi, 1991). It is crucial for researchers to comprehend the fundamental ontological and epistemological presumptions, as well as how these presumptions influence the approach and methodologies they choose to use (Alharahsheh & Pius, 2020). It is crucial for researchers to comprehend the fundamental ontological and epistemological presumptions, as well as how these presumptions influence the approach and methodologies they choose to use.

Ontology, epistemology, methodology, methods, and paradigm are key concepts in the philosophy of social sciences (Eriksson & Kovalainen, 2015). The short definition of ontology is the nature of reality as described by (Hudson & Ozanne, 1988). By pointing to various kinds of knowledge that already exist, it seeks to reveal the truth or a solution to a research issue. According to Carson et al. (2001), an epistemological definition is a short statement on how a researcher knows reality. How a researcher seeks to discover knowledge to find reality is the subject of epistemology (Alharahsheh & Pius,

2020). In terms of ontology and epistemology, different paradigms hold different notions and perspectives.

As a result, each of them may hold distinct beliefs about how reality and knowledge are viewed, and this will influence the study strategy that is mirrored in each of its methodologies and methods (Scotland, 2012).

Some reasons, specifically regarding study technique, are highlighted by Easterby-Smith et al. (2012) for why philosophical investigation may be important: First of all, it can assist the researcher in defining and honing the research techniques to be employed in a study or in making the entire research plan clearer. Contained in this would be the kind of evidence obtained, where it came from, how it was processed, and how it contributed to the resolution of the study questions. Research philosophy, secondly, will help the researcher assess various approaches and techniques and prevent improper application and needless effort by early detection of certain approaches' shortcomings. The most widely cited methodological distinctions center on the distinctions between qualitative research—which is most frequently connected with post-positivist philosophy—and quantitative research, which is typically associated with positivist philosophical traditions (Polit et al., 2010). Positivism focuses on the observable reality/facts/experiments, which will lead to the production of generalization. It relates to the tangible/measurable reality. It has a nature where the researcher is independent from the investigated/examined samples. The researcher does not influence reality but seeks to find out about the causal relationship between the gathered data in order to approve or disprove their research questions and hypotheses. The limitation here is that to the natural world, findings may not be transferable to the social world all the time. The findings are designed according to the

used variables, and maybe other variables may fit in better, but the study lacks this consideration. Various measuring tools and techniques may change the results. Generalization may lead to ignoring certain sections or intentions of individuals, therefore leaving this section to be unexplored. With a greater emphasis on descriptive study findings, positivism is more dependent on status norm. For this reason, it could be difficult for researchers to obtain an understanding of complex subjects to be included in their study (Saunders et al., 2012; Scotland, 2012).

Interpretivism has a more subjective perspective. Every human individually interprets the social and psychological world. The outcomes are debatable. Interpretivism is more involved with the in-depth variables and factors affecting a context (Alharahsheh & Pius, 2020). Rather than seeking to establish certain, universal laws that can be applied to everyone, independent of certain important circumstances and factors, interpretivism seeks to include richness in the insights gained (Saunders et al., 2012). However, interpretivism can be discussed as interpretive research may face criticism of its own because it questions the validity of information established as a foundation base and communicated as a universal law, rejecting it and calling for standards distinct from those used in the positivist paradigm (Alharahsheh & Pius, 2020). According to interpretivism, reality is arbitrary and prone to change depending on the viewpoint of the individual. Also, data is mainly dependent on a specific context, viewpoint, and values. Therefore, the results can be less generalized.

The general research strategy utilized to conduct research is what methodology is concerned with; as a result, this would determine the methods to be used and correspond with the defined research plan. Clarity on the forms of data collecting is provided by methods that are incorporated and discussed in the methodology

(Alharahsheh & Pius, 2020). The major factors influencing the study methods are methodological assumptions. These assumptions include techniques related to sampling, the size of the sample selected, as well as collection and analysis techniques for data included in the research. Two methods that can be applied, either quantitative or qualitative research. However, mixed methods can also be used in some cases.

Qualitative research is an interpretivist approach that focuses on the meaning and process when it may not be possible to examine it through quantity or amount. With less generality, qualitative research seeks to provide a specific understanding of a phenomenon based on those who are experiencing it (Alharahsheh & Pius, 2020). By conducting extensive exploratory studies, qualitative research aims to develop a thorough grasp of a particular situation in order to produce high-quality replies throughout the research.

According to Creswell (2002), a quantitative approach is a way of evaluating objective hypotheses by investigating the relationship between variables. These variables can be computed and statistically evaluated according to the input. There are a number of quantitative research procedures; survey research, which is used in most quantitative research processes and investigations.

Sukamolson (2007) defines survey research as “a technique for determining the characteristics of a population using statistical approaches that combine designed questionnaires with scientific sampling procedures”. He also defines a survey as “a form of quantitative study involving sampling questionnaire, designing, and administration” in order to compile data from the group under research and then analyze it to understand their traits/behaviors better.

Regarding the study topic, mApp users living in Europe will be the subjected population. Due to the remoteness of location, time limitation and the need to access a large sample, an online convenience sampling technique was employed. The term "convenience sampling" refers to a strategy employed by researchers to collect market research data from a pool of easily accessible respondents. The European population is rather large, and connecting to everyone who uses a tourism-based mApp is impossible. There is almost no way to test the entire community. Therefore, the survey was disseminated via online channels, and respondents volunteered to participate in the study. The main criteria were explained at the beginning of the questionnaire, and those who were not eligible for the survey did not continue to take part as a sample. In that way, any biases in the data collection were minimized.

Figure 13. Six advantages of adopting convenience sampling

3.2 Sample and Population

The target research area is selected to be European consumers for various reasons. Europe has a 746.4 million population, with more than 90% of mobile devices buying products and services through mApps. A large youth population in Europe has helped

boost application usage. In 2018, mobile app downloads in Europe amounted to 25.8 billion and were projected to reach 30.4 billion annual app downloads in 2023. It is the second continent with the highest number of app downloads. Europe continues to be the world's largest outbound region for tourist flows, accounting for more than half (51 percent) of all international arrivals each year (UNWTO, 2019). Europe had the highest international tourism figure in 2020 (UNWTO, 2021a) and provided the most international tourists by region of origin in 2019 (UNWTO, 2021b). According to the population of Europe, the required sample size was 384.

3.3 Questionnaire Development

The questionnaire was designed with multiple sections. Several procedural remedies were used to reduce the potential common method bias (Podsakoff et al., 2003). The first part of the questionnaire includes general demographic questions. It assures that the respondent has a recent involvement with a travel-based mApp by asking for the mApp name, duration of experience with the mApp, and the user's frequency of travel.

The second part of the questionnaire addresses DOI's constructs: simplicity, compatibility, and benefit. The three items for simplicity, four for benefit, and three for compatibility were measured with scales from Fang et al. (2017). The third part of the questionnaire addresses the constructs of UGT: playfulness, informativeness, and social interaction. Playfulness was evaluated using four items, informativeness was evaluated using four items, and social interaction was evaluated using four items from Kim et al. (2020) study. The last part of the questionnaire measures mApp users' experience in terms of perceived value, satisfaction, mApp engagement, and intention to continue using. Three items for perceived value were measured using the scale from Mohd Suki (2017). Four items regarding user satisfaction were measured with the

scale from Wang et al. (2019). Five items for mApp engagement were measured using the scale Tarute et al. (2017), and six items regarding the intention to continue use were measured with the scale from Tarute et al. (2017). This multi-item questionnaire utilized the 5-point Likert-type scale ranging from “Strongly Disagree” to “Strongly Agree.”

3.4 Data Collection

An online convenience sampling technique was employed. An online form was designed using the Microsoft Forms application. The original version of the questionnaire was prepared in English. The content validity of the instrument was examined by submitting the questionnaire to five specialists, including two practitioners and three academics who are specialists in the subject of mobile engagement platforms. They proposed minor adjustments that were implemented to the final version of the questionnaire.

To further reduce measurement errors before gathering actual data, the validity of the content was verified by a pre-test, which took place in April 2021. 30 respondents were used to check the survey’s clarity and fill out the questionnaire in order to detect confusing concepts or questions that would be difficult to respond to. According to Kumar (2011), a pre-test should be conducted on a group of persons who share the same characteristics as the research population. The same questionnaire was utilized to collect data later, as the participants reported no difficulties comprehending or answering the questions.

Actual participants were gathered through mApp-related consumer discussion social media groups. We conducted a keyword search on social media platforms to locate

mApp groups. Once the groups were identified, we sent in requests to join. The survey URL and background information about our study were included in the messages accompanying the group requests. The study's aim, ethical considerations, the survey's autonomy, and the time commitment necessary were all communicated to group administrators and moderators via private messages. We shared the survey URL on each group's social media page which was updated with explanatory text about informed consent and the time commitment required to take the survey.

The actual data was collected from May 2021 to July 2021. 548 responses were received. After discarding 38 responses due to more than 10 percent missing values, 510 valid responses were obtained with a 78.5 percent return rate. The demographic profiles of the respondents are provided in Table 1.

Table 1. Demographic profile.

Characteristics	**Frequency (N=510)**	**Percent (%)**
Age		
Under 20	16	3.2
20-29	398	78
30-39	67	13.1
40-49	19	3.7
50-59	5	1
60 or above	5	1
Gender		
Female	352	69
Male	158	31
Education level		
Below or high school	26	5.1
College	33	6.5
University	355	69.6
Graduate school or higher	96	18.8
Monthly income		
Below 1000 euro	185	36.3
1000 to 2999	206	40.4
3000 to 4999	74	14.5
5000 euros and above	45	8.8

As observable from the table above, 69 percent of the participants were female, and 31 percent were male. The age range shows that over 78 percent of the participants are from the youth population of Europe aged between 20-29. The reason for this can be explained as the survey was collected from online consumer panels and the users of these panels are observed to the mostly in this age range. Most respondents accepting to participate in the survey were categorized in the 20-29 age group. The main reason for this can be explained as this age range use mobile applications at a far higher rate than other ranges. Approximately 13 percent were aged between 30-39. Most participants' education levels were observed to be university-level.

3.5 Data Analyses

As Schumacker & Lomax (2016) recommended, a two-step approach was utilized to evaluate the measurement model and test the structural model. Hence, the data was analyzed using SPSS 24 and AMOS 26. Confirmatory factor analysis (CFA) was used to examine the measurement model. The CFA was used to evaluate the reliability and validity of the constructs. All the items significantly load on their relative constructs. To analyze the entire measurement model, fit indicators were used. The value obtained for NFI, IFI, TLI, CFI, and RFI was above the cut-off level of 0.9, and the value obtained for RMSEA was lower than 0.08 (Byrne, 2001); thus, the measurement model indicates a good model fit.

Additionally, we ran CFA for different models to check the most suitable model, five complementary measurement models were estimated, and their fit indicators were contrasted (Huertas-Valdivia et al., 2021; Rojo et al., 2016). As illustrated in Table 3, based on the results, The proposed measurement model is the most realistic data representation. The alternative models have significantly lower global fit indices, and

these indices worsen as more variables combined. Thus, the findings contribute to the confirmation of reasonable discriminant validity.

Table 2. Measurement model results.

Variables and Items	Standardized loadings	*t*-value	Cronbach's Alpha	AVE	CR
Simplicity (SIM)			**0.80**	**0.58**	**0.81**
SIM1: The travel app is easy to use.	0.79	F			
SIM2: Learning how to use this travel app is easy for me.	0.65	14.69			
SIM3: I would imagine that most people would learn to use this app very quickly.	0.84	19.37			
Benefit (BEN)			**0.77**	**0.55**	**0.78**
BEN1: This travel app enhances my trip planning and traveling experience.	0.69	F			
BEN2: This travel app makes it easier to understand destinations.	-	-			
BEN3: This travel app helps me save a lot of time.	0.72	14.50			
BEN4: This travel app makes trip planning and traveling more effective.	0.81	15.92			
Compatibility (COM)			**0.87**	**0.70**	**0.87**
COM1: This travel app is compatible with my travel preferences.	0.75	F			
COM2: This travel app suits my travel needs.	0.87	20.04			
COM3: This travel app fits well with my travel needs.	0.88	20.33			
Informativeness (INF)			**0.76**	**0.62**	**0.76**
INF1: I appreciate various things about the travel app.	-	-			
INF2: I have a variety of experiences while using the travel app.	-	-			

INF3: I get varied knowledge from using the travel app.	0.79	12.89			
INF4: I collect diverse information by using the travel app.	0.77	F			
Social interaction (SOC)			**0.94**	**0.80**	**0.94**
SOC1: Using the travel app enables me to create social relationships with other users.	0.89	F			
SOC2: Using the travel app helps me maintain social relationships with others.	0.92	30.71			
SOC3: Using the travel app helps me make new friends.	0.86	26.97			
SOC4: Using the travel app enhances my social relationships with others.	0.90	28.23			
Playfulness (PLA)			**0.85**	**0.57**	**0.84**
PLA1: Using this travel app is enjoyable for me.	0.75	F			
PLA2: Using this travel app is pleasurable for me.	0.78	19.94			
PLA3: Using this travel app is fun for me.	0.75	15.03			
PLA4: Using this travel app keeps me happy.	0.74	14.11			
Perceived value (PV)			**0.74**	**0.51**	**0.75**
PV1: The travel app on my mobile device is saving my time.	0.66	F			
PV2: The travel app on my mobile device allows me to identify the precise thing, which I am looking for.	0.75	14.15			
PV3: The travel app on my mobile device provides more options in terms of the trip planning.	0.70	13.44			
User satisfaction (SAT)			**0.85**	**0.61**	**0.86**
SAT1: I am satisfied with the travel app.	0.81	F			
SAT2: The travel app has met my expectations.	0.80	20.13			
SAT3: My experience with the travel app is very pleasing.	0.72	17.69			

SAT4: The travel app does a satisfactory job of fulfilling my needs.	0.78	17.71			
mApp engagement (ENG)			**0.84**	**0.65**	**0.88**
ENG1: Whenever I have to use a travel app, I usually use this app.	-	-			
ENG2: I am passionate about this mobile app.	0.85	F			
ENG3: I love this mobile app.	0.82	22.14			
ENG4: I am excited when using this mobile app.	0.79	20.01			
ENG5: I am proud of using this mobile app.	0.76	19.82			
Intention to continuing use (ICU)			**0.82**	**0.64**	**0.87**
ICU1: I think that I would use this mobile application in the future.	0.80	F			
ICU2: I like to use this mobile application.	0.81	19.88			
ICU3: I tend to leave positive comments about this mobile application.	-	-			
ICU4: I think this mobile application is the best out of similar ones.	-	-			
ICU5: I would like to use this mobile application in the future.	0.80	19.18			
ICU6: I would recommend this mobile application for my family and friends.	0.78	19.04			

Note: F=fixed; AVE=average variance extracted; CR=composite reliability.

Chapter 4

FINDING AND RESULTS

4.1 Structural Model

The results of confirmatory factor analysis lent support to the ten-factor measurement model. Precisely, the measurement model results in a good fit: X^2 = 995.883, *df* = 474, X^2/df = 2.101; CFI = 0.954; PNFI = 0.775; TLI = 0.946; RMSEA = 0.047; SRMR = 0.0454. Table 2 reveals that all the BEN2, INF1, INF2, ENG1, ICU3, and ICU4 items were removed because the loading value was less than 0.6, while the remaining items had a more significant level than 0.6. In other words, each item is presented as a powerful measure of its variable.

According to Fornell & Larcker (1981), the average variance retrieved from all variables was more than 0.5, confirming the convergent validity. The discriminant validity was assessed through three different techniques. Firstly, the CFA results used to check the fit indices of the ten-factor measurement model, as given in Table 3, proved the measurement model's superiority compared to alternative models. Secondly, the AVE square root of each construct compared to the intercorrelations suggested by Fornell & Larcker (1981), only the square root of the AVE for SAT is less than its correlation with PV. As a result, we employed the Anderson & Gerbing (1988) criteria to re-evaluate the discriminant validity of these two conceptions. The chi-square and df findings of two-factor SAT and PV with single-factor SAT and PV were compared and found to be significant. Lastly, as given in Table 4, the Heterotrait-

Monotrait ratios were lower than 0.85 (Fornell & Larcker, 1981; Henseler et al., 2015). Thus, the study's discriminant validity was established.

The composite reliability (CR) and Cronbach's alpha (α) of each construct are greater than the threshold level of 0.7; therefore, the internal consistency reliability was achieved for this study (Bagozzi & Yi, 1988).

Table 3. Model comparison

	$\chi 2$	*df*	$\chi 2/df$	$\Delta\chi 2$	Δdf	CFI	TLI	PNFI	RMSEA	SRMR
Model 1	995.883	474	2.101	-	-	0.954	0.946	0.775	0.047	0.0454
Model 2	3462.239	509	6.802	2466.356	35	0.742	0.716	0.646	0.107	0.1361
Model 3	3533.595	513	6.888	2537.712	39	0.736	0.711	0.645	0.108	0.1366
Model 4	4361.088	516	8.452	3365.205	42	0.664	0.635	0.586	0.121	0.1625
Model 5	4492.671	518	8.673	3496.788	44	0.653	0.624	0.578	0.123	0.1437
Model 6	4746.376	519	9.145	3750.493	45	0.631	0.601	0.559	0.127	0.1426

Note: Model 1 = Hypothesized model
Model 2 = five factors (SIM+BEN+COMP+PLA+INF+SOC), PV, SAT, ENG, AND ICU
Model 3 = four factors (SIM+BEN+COMP+PLA+INF+SOC), (PV+SAT), ENG, and ICU
Model 4 = three factors (SIM+BEN+COMP+PLA+INF+SOC), (PV+SAT), and (ENG+ICU)
Model 5 = two factors (SIM+BEN+COMP+PLA+INF+SOC), (PV+SAT+ENG+ICU)
Model 6 = all factors combined
CFI = Comparative fit index; TLI = Tucker-Lewis index; PNFI = Parsimony normed fit index; RMSEA = Root mean square error of approximation; SRMR = Standardized root mean square residual; SIM = Simplicity; BEN = Benefit; COM = Compatibility; PLA= Playfulness; INF = Informativeness; SOC = Social interaction; PV = Perceived value; SAT= User satisfaction; ENG= mApp engagement; ICU= Intention for continuing use.

Table 4. Heterotrait-Monotrait ratios

	SIM	BEN	COM	PLA	INF	SOC	PV	SAT	ENG	ICU
SIM	-									
BEN	0.798	-								
COM	0.727	0.791	-							
PLA	0.454	0.485	0.489	-						
INF	0.309	0.465	0.382	0.537	-					
SOC	0.000	0.000	0.000	0.425	0.384	-				
PV	0.668	0.827	0.727	0.475	0.484	0.000	-			
SAT	0.717	0.748	0.729	0.551	0.412	0.000	0.856	-		
ENG	0.210	0.363	0.327	0.727	0.512	0.522	0.349	0.451	-	
ICU	0.687	0.728	0.735	0.544	0.390	0.000	0.748	0.871	0.464	-

Note: SIM = Simplicity; BEN = Benefit; COM = Compatibility; PLA= Playfulness; INF = Informativeness; SOC = Social interaction; PV = Perceived value; SAT= User satisfaction; ENG= mApp engagement; ICU= Intention for continuing use.

4.2 Common Method Variance Check

Statistical remedies were used to check for common method variance, as self-reported data were used (Podsakoff et al., 2003). Harman's single-factor test was applied to control common method variance threat (Podsakoff et al., 2003). The results obtained from unrotated exploratory factor analysis showed that the first factor explained 36.0% of the variance, which is less than 50% (Fuller et al., 2016). Thus, it gives the impression that common method variance is not a concern.

4.3 Hypotheses Testing

As illustrated in Table 5, hypothesis H1, which implies SIM relates positively to PV ($\beta = 0.121$, $t = 3.586$***), empirically receives support. Similarly, we observed that there are significant direct positive effects from SIM to SAT, BEN to PV, BEN to SAT, COM to PV, and COM to SAT ($\beta = 0.186$, $t = 5.942$***), ($\beta = 0.453$, $t = 8.033$***), ($\beta = 0.298$, $t = 7.231$***), ($\beta = 0.252$, $t = 6.582$***), and ($\beta = 0.311$, $t = 8.893$***) respectively. Thus, hypotheses H2, H3, H4, H5, and H6 received empirical support. Whereas, H7 that imply INF relates positively to PV ($\beta = 0.097$, $t = 3.234$ns), H8 which imply INF relates positively to SAT ($\beta = 0.049$, $t = 2.299$ns), H9 that imply SOC relates positively to PV ($\beta = -0.040$, $t = -2.256$ns), H10 that imply SOC relates to SAT ($\beta = -0.042$, $t = -2.624$ns) and H11 which imply PLA positively relates to PV ($\beta = 0.078$, $t = 2.528$ns), were not empirically supported. Hypothesis H12 which states PLA positively relates to SAT ($\beta = 0.232$, $t = 6.696$***) received empirical support. Both H13 and H14 which implies PV positively relates to ENG ($\beta = -0.076$, $t = -0.563$ns) and PV positively relates to ICU ($\beta = 0.163$, $t = 2.177$ns) respectively were not empirically supported. Lastly, both H15 which claims SAT positively relates to ENG ($\beta = 0.793$, $t = 6.223$***) and H16 which claims SAT positively relates to ICU ($\beta = 0.941$, $t = 10.271$***), received empirical support (see Figure 19).

The bootstrap technique was used to test for mediation effects since it is more accurate than Baron and Kenny's test (Preacher & Hayes, 2008). According to Zhao et al. (2010), mediation is verified when the indirect effects are statistically significant, and there is no zero in the confidence interval encompassing the confidence interval. Table 6 shows the standardized indirect bias-corrected bootstrap estimates with a 95 percent confidence interval based on 5000 bootstrap samples.

As expected, SIM has a strong positive effect on SAT ($\beta = 0.186$, $t = 5.942$***) and SAT has a strong positive effect on ICU ($\beta = 0.941$, $t = 10.271$***), thus, H2 and H16 were confirmed. Hypothesis H30 implies that SAT mediates the association between SIM and ICU ($\beta = 0.200$, $p < 0.05$), thus, H30 empirically received support. As both the H4 and H16 that implies direct effects of BEN on SAT ($\beta = 0.298$, $t = 7.231$***) and the direct effect of SAT relates positively to ICU ($\beta = 0.941$, $t = 10.271$***) were supported, respectively, and the indirect effect of SAT on the link between BEN and ICU ($\beta = 0.284$, $p < 0.001$) was supported; thus, H32 was also supported. Therefore, SAT mediates the link between BEN in ICU. Hypothesis H38 proposed that SAT mediates the link between COM and ICU. In this regard, as already discussed, both H6 and H16 were supported. Also, COM--->SAT--->ICU ($\beta = 0.326$, $p < 0.001$), received support. Thus, we can conclude that SAT mediates the effect of COM on the ICU. Regarding H40, the proposed SAT mediates the link of PLA on ICU since the direct effects (H12 and H16) were both significantly supported, and the indirect effect of PLA--->SAT--->ICU ($\beta = 0.276$, $p < 0.001$) was supported, based on the findings we conclude that SAT mediates the relationship between PLA and ICU.

Table 5. Hypothesized paths (direct effects)

Direct effects	**Path coefficients (*β*)**	***t*-values**	**Remarks**
SIM ---> PV	0.121	3.586^{***}	**Supported**
SIM ---> SAT	0.186	5.942^{***}	**Supported**
BEN ---> PV	0.453	8.033^{***}	**Supported**
BEN ---> SAT	0.298	7.231^{***}	**Supported**
COM ---> PV	0.252	6.582^{***}	**Supported**
COM ---> SAT	0.311	8.893^{***}	**Supported**
PLA ---> PV	0.078	2.528^{ns}	Not supported
PLA ---> SAT	0.232	6.696^{***}	**Supported**
INF ---> PV	0.097	3.234^{ns}	Not supported
INF ---> SAT	0.049	2.299^{ns}	Not supported
SOC ---> PV	-0.040	-2.256^{ns}	Not supported
SOC ---> SAT	-0.042	-2.624^{ns}	Not supported
PV ---> ENG	-0.076	-0.563^{ns}	Not supported
PV ---> ICU	0.163	2.177^{ns}	Not supported
SAT ---> ENG	0.793	6.223^{***}	**Supported**
SAT ---> ICU	0.941	10.271^{***}	**Supported**

Note: Note: * $p < 0.050$; *** $p < 0.001$; “ns = Not supported”; SIM = Simplicity; BEN = Benefit; COM = Compatibility; PLA= Playfulness; INF = Informativeness; SOC = Social interaction; PV = Perceived value; SAT= User satisfaction; ENG= mApp engagement; ICU= Intention for continuing use.

Table 6. Hypothesized paths (indirect effects)

Indirect Path	Standardized estimates	Lower	Upper	P-Value	Remarks
SIM --> PV --> ENG	-0.013	-2.430	0.049	ns	Not supported
SIM --> PV --> ICU	0.023	0.000	0.083	ns	Not supported
SIM --> SAT --> ENG	0.118†	0.040	2.515	ns	Not supported
SIM --> SAT --> ICU	0.200*	0.052	0.289	0.018	**Supported**
BEN --> PV --> ENG	-0.042	-7.036	0.361	ns	Not supported
BEN --> PV --> ICU	0.072	-0.030	0.194	ns	Not supported
BEN --> SAT --> ENG	0.167†	0.050	8.033	ns	Not supported
BEN --> SAT --> ICU	0.284***	0.176	0.921	0.001	**Supported**
COM --> PV --> ENG	-0.026	-2.780	0.173	ns	Not supported
COM --> PV --> ICU	0.045	-0.010	0.120	ns	Not supported
COM --> SAT --> ENG	0.191†	0.064	3.199	ns	Not supported
COM --> SAT --> ICU	0.326***	0.189	0.459	0.001	**Supported**
PLA --> PV --> ENG	-0.007	-3.944	0.024	ns	Not supported
PLA --> PV --> ICU	0.013	-0.014	0.069	ns	Not supported
PLA --> SAT --> ENG	0.162†	0.016	2.065	ns	Not supported
PLA --> SAT --> ICU	0.276***	0.139	0.321	0.001	**Supported**
INF --> PV --> ENG	-0.015	-1.156	0.076	ns	Not supported
INF --> PV --> ICU	0.026	-0.003	0.054	ns	Not supported
INF --> SAT --> ENG	0.048	-0.008	0.804	ns	Not supported
INF --> SAT --> ICU	0.081	-0.003	0.123	ns	Not supported
SOC --> PV --> ENG	0.008	-0.013	0.694	ns	Not supported
SOC --> PV --> ICU	-0.013	-0.037	0.000	ns	Not supported
SOC --> SAT --> ENG	-0.048	-0.664	0.005	ns	Not supported
SOC --> SAT --> ICU	-0.081	-0.077	0.002	ns	Not supported

Note: * $p < 0.050$; SIM = Simplicity; BEN = Benefit; COM = Compatibility; PLA= Playfulness; INF = Informativeness; SOC = Social interaction; PV = Perceived value; SAT= User satisfaction; ENG= mApp engagement; ICU= Intention for continuing use.

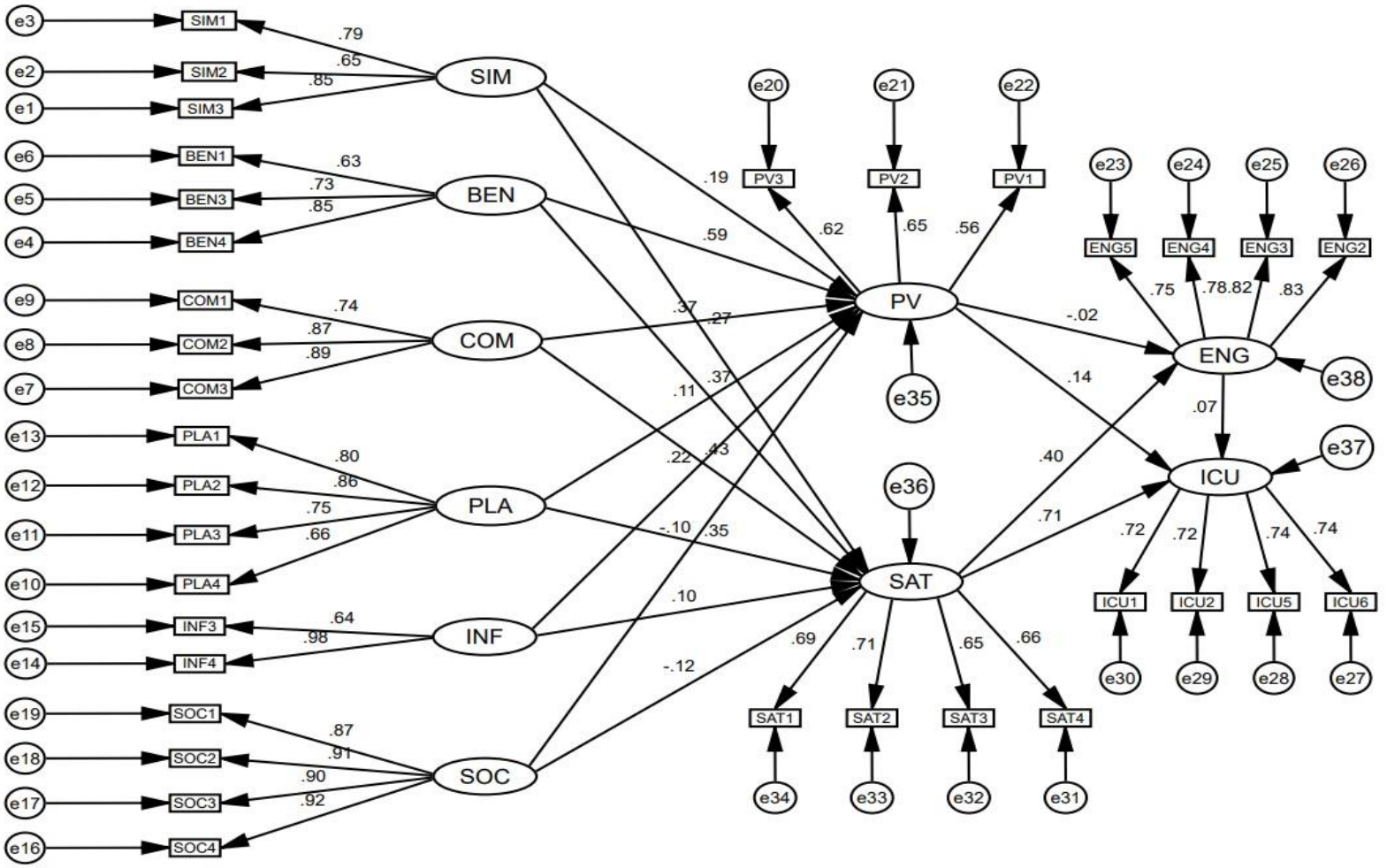

Figure 14. Results of model

4.4 Discussion

In Hypotheses 1 and 2, research results verified a relationship between simplicity with perceived value and user satisfaction. Simplicity is an important element for a good user experience. The study results are in line with Tran Le Na & Hien's (2021) statement that ease of use (simplicity) impacts perceived value in adopting technology and Verkijika & De Wet's (2019) statement that simplicity has a substantial role in forming perception about the system, influencing users' satisfaction. The basic and navigable structure of an application interface is shown to have importance in building a perceived value and satisfaction from the consumers' perception.

In Hypotheses 3 and 4, it is presumed that benefits from the mobile app positively influence perceived value and user satisfaction. Benefit (also mentioned as a relative advantage in many studies) shows the superiority of the technology over its competitors or pre-versions, offering better conditions. Previous studies confirmed that benefits positively affected the perceived value of mobile payment services (Lin et al., 2020). Another study by Lee & Shin (2018) analyzed that relative advantage is one of the key characteristics of a smartphone influencing user satisfaction. Therefore, advantageous mApps help build perceived value and user satisfaction.

In Hypotheses 5 and 6, it is claimed that compatibility of the mobile app positively affects perceived value and user satisfaction. Compatibility is another important element of innovation. It is the degree to which an invention is regarded to be fitting with potential consumers' existing values, past experiences, and needs Lin et al. (2020) study outcomes are in line with our findings that mobile payment service compatibility significantly affected perceived value. (Awais et al., 2022) study outcome analyzed

and concluded that mApp compatibility had a significant association with user satisfaction. Our study results on tourism-based mApps showed that consumers valued compatibility. The results proved that compatibility had a substantial relation with perceived value and user satisfaction. Based on the relative literature in the tourism field very few studies have investigated the effect of DOI constructs (simplicity, benefit, and compatibility) effect on perceived value and user satisfaction when considering the mApp which is used by a large population to make reservation and plan a vacation. Consumers may opt in and out of using mApps for various reasons. MApp developers or service providers of the tourism industry should carefully consider improving these characteristics of an application.

In Hypotheses 12, we examined UGT construct playfulness. Playfulness has found empirical support for user satisfaction. Playfulness is related to innovation providing entertainment and enjoyment to the consumer. In our case exploring new places, finding deals and making reservations were tested as to how much joy, pleasure and happiness the consumer would receive. The outcomes proved that playfulness has a positive impact on user satisfaction. This result is in accordance with the study of Liu et al. (2021) who also found support for playfulness over user satisfaction based on E-book mobile applications. The playfulness of the mApp appears to influence consumers' concentration, curiosity, and enjoyment enhancing their satisfaction.

In Hypotheses 15 and 16 we have tested and received a response regarding the relations between user satisfaction and our conceptual framework dependent variables mApp engagement and intention to continue use. User satisfaction has received empirical support for its relationship with Mapp engagement and intention for continuing use. One of the most important outcomes of this study is to explore the antecedents of

mApp engagement and intention to continue use. The target of every mobile app developer or service provider in the tourism industry is to keep their consumers engaging on a continuing basis. They do not prefer their consumers to switch to another application. If user satisfaction is enhanced, then mApp engagement and intention to continue use are likely to be achieved. These findings are in line with previous studies by Pang (2021) who found the significant effect of satisfaction on eWOM engagement and Kim et al. (2013) highlighted the necessity of satisfaction on smartphone user engagement and intention behavior. Another study by Goel et al. (2022) also supported that customers' intent to continue e-shopping was influenced by customer satisfaction.

Chapter 5

CONCLUSION

5.1 Conclusion

The widespread use of mobile devices and the daily amount of time consumers spend on mApps are increasing. Conducting many day-to-day transactions online is becoming a lifestyle. People are seeking effortless options to conduct various tasks. In tourism, mApps have brought practical solutions to replace many tourism agencies. People are not only able to browse vacations, but they are also able to make reservations, make online payments, and read reviews of other travelers. Many similar applications are competing in the market. Every tourism agency seeks ways to generate long-term consumers who keep engaged with the application and intend to continue using it. The study aims to understand the properties of mApps influencing consumers to form perceived value and satisfaction. The study examines the relationship between the most important constructs of the two popular theories: DOI and UGT, with perceived value and user satisfaction. The study also analyses the influence of perceived value and user satisfaction on mApp engagement and intention for continuing use among mApp users in Europe. The respondents had to use a tourism-based mApp and share their experiences and feelings according to its functionality. A theoretically integrated model has been created and tested in the tourism domain despite the growing importance and interest in mApps.

5.2 Theoretical Implications

This study contributes to the tourism and technology literature in a few ways. Firstly, the study brings a new perspective and contribution to the mApp tourism-related fields. The research extends the empirical studies in tourism and technology literature by developing and testing a model that integrates the DOI theory and UGT. Both theories are tested for their direct effect on perceived value and user satisfaction. The literature lacks in testing the factors which may influence mApp engagement and intention for continuing use. The first theory, DOI, tests the application properties, and the second theory, UGT, tests the consumer motives and how they satisfy their needs. This is an initial attempt to develop an integrated model using the theories to understand the consumers' perspective and needs in the mApp field; therefore, the study aims to verify which factors contribute to Mapp engagement and intention for continuing use. The model tests the direct effects of the most important constructs of the two theories over perceived value and user satisfaction. The findings corroborate previous studies that support the result that DOI theory constructs impact the user's satisfaction and perceived value.

Not to forget that DOI theory is well established for explaining how an innovation spreads throughout the population (Wang et al., 2012). The simplicity of the application design is important. Consumers should be able to follow the services of the mobile app effectively. With a clear user interface design, simplicity will help bring more rapid service enabling users to achieve their aims more easily. The study found that simplicity had a positive effect on perceived value and user satisfaction. These findings align with and support Kim's (2021) statements on retail apps. The lower the complexity, the higher the perceived value of the consumer with a bad experience

flow. The findings also support Tran Le Na and Hien's (2021) statement regarding ease of use (simplicity) impacting perceived value in adopting technology. The results support the work of Verkijika and De Wet (2019), who demonstrated that simplicity was positive and significantly associated with user satisfaction.

The compatibility of the mApp is described as the degree to which users' sense of value, experience, and needs for the Mapp aligns with those of the existing mApp. The study's findings on compatibility confirmed that it positively influences perceived value, which is also approved in Lin et al.'s (2020) study on mobile payment services. Compatibility positively affects user satisfaction, extending prior research on the study about the impact of mApp compatibility, online shopping, and payment on user satisfaction (Awais et al., 2022).

Another important element of the DOI Theory is the benefit. Our study shows that benefits influence perceived value and satisfaction. This outcome extends the findings of prior studies by Wang et al. (2020) on mobile government services, which supports the fact that relative advantage (benefit) influences perceived value. Benefits have also shown support for user satisfaction. Users seem to receive satisfaction from the application when they receive the application functions as beneficial. Alnawas and Aburub's (2016) study of branded mApps complies with our findings. Their study results confirm that the benefit offered by an mApp positively affects user satisfaction.

Our study utilizes the theoretical framework of the UGT to investigate whether the mApps' uses and gratifications influence perceived value and user satisfaction. UGT is popularly used to explain how the population uses media to gratify specific wants and needs (Ho & Syu, 2010). A few prior studies have analyzed UGT's relationship

with mobile technologies and some have found a significant relationship between the theory constructs and mobile technologies. The study points to the motives and gratifications of mApp users regarding playfulness, informativeness, and social interaction. Although the study analyzed the effects of these constructs on perceived value and user satisfaction, the outcome showed that only playfulness had a positive impact on user satisfaction. This finding supports and helps explain previous studies. Ma et al. (2019) study outcomes on security education and social media confirmed the significant effect of entertainment (playfulness) on user satisfaction. The insignificant roles of the remaining uses and gratifications towards perceived value and user satisfaction must be further explored before any conclusion can be drawn. There could be a requirement for different mediators or moderators to explain such an influence. Some previous studies also found insignificance between the uses and gratifications, as Choi et al. (2016) study on social media marketing couldn't find support between social interaction and user satisfaction. The research confirmed that social interaction did not significantly affect user satisfaction with the hotel's social media page. Another study by Wuryandari (2021) on the Uses and Gratification of Virtual Purchase Behavior of Mobile Game Items found no relation between utilitarian gratification (playfulness, entertainment) and perceived value. Another study by Paul et al. (2020) analyzed the effect of Uses and Gratifications on satisfaction in developing positive Electronic Word of Mouth (EWom) on social media. Their study lacked support between information seeking (informativeness) and user satisfaction, as well as between social enhancement (social interaction) and user satisfaction.

The current study makes a substantial contribution to the limited literature on the effects of user satisfaction on mApp engagement and intention for continuing use. The study outcomes show a significant effect between these variables. User satisfaction significantly influences mApp engagement. This investigation supports Cheung et al. (2015) study regarding online game sales, where the findings proved that game satisfaction is positively associated with customer engagement. Another study by Kamboj et al. (2022) also investigated the effects of user satisfaction on customer engagement in m-banking applications. The outcomes showed that user satisfaction eventually affected customer engagement. Another relationship supported in this study is the effect of user satisfaction on the intention to continue using mApp. Many prior studies have proven the effect of users' satisfaction over the intended innovation, such as mobile communication applications (Wang & Chen, 2019), smart city services (Abu Salim et al., 2021) and Internet banking services (Tsai et al., 2014). This finding stands in line with previous literature.

5.3 Practical Implications

This study makes practical contributions to the association between DOI constructs and perceived value and user satisfaction. The relation between user satisfaction and mApp engagement and intention to continue use is also highlighted in the findings. Few prior studies integrate the DOI theory with the UGT and very few focus on the issue from the user's perspective. The integrated model created in this study helps to comprehend European mApp users' emotional reactions towards certain application properties and how this may influence users to engage with the application and motivate the users' intention for continuing use. The competitive environment of the tourism industry is driving service providers to find new and more attractive options to keep their consumers engaged. Many mApps provide very similar services.

Consumers have many choices of applications that they download and rarely use. An mApp's functionality, simplicity, benefit, compatibility, and playfulness are the most important elements affecting the consumers' overall experience with the application. The satisfaction gained from successive designs and elements of the application will affect the consumers' future behavior, enhancing engagement and continuing use. The outcomes of this study can be beneficial for software application developing companies, UI/UX designers, and service providers within the tourism industry.

Simplicity, benefit, and compatibility of an application are important to the DOI generally and specifically to the diffusion of a certain mApp which is taking part among many other competing mApp in the tourism sector. Software application developers should focus on these elements and use a consumer-centric approach when developing and improving a mApp. Empirical evidence from this study has shown that simple, easy-to-use design promotes perceived value and user satisfaction. The simplistic design drives developers to evaluate the consumer's fundamental needs and deploy features necessary for the mApp. Creating a seamless and straightforward process for the consumer will encourage satisfaction and perceived value. The consumer also requests an application to be beneficial and compatible compared to what it supersedes. Although the brand name is impressive, the differentiating features and relative advantage will help the application stand out from its competitors. The effectiveness of the functionalities and how they meet the consumers' needs helps to strengthen the existing consumer relationships, maintain satisfaction and value, and helps to attract prospective consumers. Playfulness is an important gratification construct. Playfulness as a way of interacting with the mApp is increasingly important in human-computer interaction and application design. Playfulness represents the

enjoyment consumers receive as they use the application for their transactions. Planning a trip, searching for a location, sharing reviews, and making reservations through the mApp motivates the consumer and gives them a sense of joy. The playful experience of using a mApp positively impacts the consumer's attitude as consumers are more likely to engage in activities that give them pleasurable experiences and good feelings. The outcomes verify that this emotional construct has an impact on user satisfaction.

The study outcomes have also highlighted user satisfaction's importance over mApp engagement and intention to continue use. The overall achievement for any application developing company or service provider is having user engagement and intention for continuing use. These are the signals of loyalty and long-term commitment to the consumer. Application developing companies and service providers in the industry may focus on the consumers' various needs, pain points, impactful problems, and other elements that guide the development of mApp features. These outcomes intend to achieve consumer satisfaction and loyalty, which will, consequently, enhance consumer engagement and intention to continue using mApp. The study findings revealed that engagement and intention to continue use are positively impacted by user satisfaction, meaning that if the consumer is happy with the mApp features and gratifications, they would be willing to engage with the application and continue using it in the future.

5.4 Answers to the Research Questions

1. How do the constructs of Diffusion of Innovation Theory (DOI) and Uses and Gratifications Theory (UGT) influence user satisfaction (SAT) and perceived value (PV)?

   Diffusion of Innovation theory (DOI) constructs have fully shown a positive influence on user satisfaction and perceived value. Simplicity, compatibility, and benefit of an mApp are impacting user satisfaction and perceived value. Simplicity, the opposite of complexity, indicates the degree to which the mApp is viewed as being free of effort to operate and understand. When a mApp is efficient in learning to use and collecting necessary information, it brings user satisfaction and gains more perceived value. Compatibility reflects the degree to which people believe using a mApp fits their travel requirements and desires. These technological characteristics and task characteristics affect users' perception of perceived value and satisfaction. The benefit is a result of the innovativeness of mApp. Measuring how consumers perceive the benefit of an application involves a variety of factors, including both real and intangible advantages that typically have to do with its functioning and level of personalization, which has also been shown to help build perceived value and satisfaction when the consumer feels that the travel app is superior to other existing travel apps. Uses and Gratifications theory (UGT) construct playfulness has shown a significant effect on user satisfaction. Consumers feel satisfaction when they experience the sense of being entertained and joyful when using mApp. The findings have shown that there is no significance between playfulness and perceived value. For the other constructs of UGT,

informativeness and social interaction, there has been no significance proven for perceived value and user satisfaction. While some studies have also found insignificant effects for these variables, the reason for this outcome should be further examined before drawing a conclusion.

2. How do SAT and PV impact mApp engagement (ENG) and intention for continuing use (ICU) for tourism-related mApps?

   User satisfaction has shown a positive relation with mApp engagement and intention for continuing use. Satisfaction towards the mApp may be evaluated in two ways, transaction-specific and cumulative perspective. The level of pleasure concerning a particular transaction in a particular circumstance is referred to as the transaction-specific perspective of satisfaction. The cumulative perception suggests that the mApp entity, such as the service delivery system, vendor, or service provider, is evaluated overall by consumers to determine how satisfied they are with that entity. If the consumer experiences satisfaction with the mApp, this will motivate them to engage and continue using the mApp. On the other hand, the perceived value did not show any effect on mApp engagement and intention for continuing use.

5.5 Limitations and Suggestions for Future Study

This study has a few limitations. Firstly, the study location is selected as Europe because of the large youth population with a high rate of mobile devices and applications. Samples were taken from respondents residing in 31 different countries. The interpretation of the study results may be revised for other continents, such as Asia or the United States. These continents may have different culture-specific orientations or motives for engaging and continuing to use a mApp. Age is also another limitation. Most participants were observed to be in the 20-29 age range. Higher age ranges may have a different perception or attitude towards engaging with and continuing to use a mApp. The results may be generalized better if all age groups were considered on an equal basis.

Another important limitation is that the users were provided a questionnaire in a single language (English). In Europe it may be considered that some users would prefer to express their opinions and ideas more freely when they are provided with a questionnaire in their own local language. Also, it must be considered that users may not speak or understand English.

The statistics showed that 36 percent of the respondents had a monthly income of 100 Euro or below. This may imply that with such a low income, a user may not be a frequent traveler therefore affecting the number of times that user interacts with a travel-based software application.

The following limitation of the study was that it prompted users to select the application they were using. The results were majorly centered on four popular applications used in Europe. Future studies may consider focusing on a specific mApp

where respondents may share their observations about the same application. Software developing companies and tourism service providers may use this method as an opinion poll. The questionnaire will help them collect consumer reviews and upgrade their product accordingly. Many service providers use short questionnaires or online polls as a marketing strategy.

The next limitation was the constructs of both theories used for this study. Only three constructs were selected from each theory. Future studies may focus on adding the remaining constructs (trialability and observability for DOI theory and escape, exposure, and affection for UGT) to understand their overall influence on mApp engagement and intention to continue use.

Lastly, the data used in the study is cross-sectional. Future research may consider collecting the data on a longitudinal basis, comparing the results, and analyzing the perception pattern changes over time.

REFERENCES

Abbaspour, B., & HazarinaHashim, N. (2015). The influence of website quality dimensions on customer satisfaction in travel website. *International Journal of Science Commerce and Humanities*, 3(5), 6-17.

Abu Salim, T., El Barachi, M., Onyia, O. P., & Mathew, S. S. (2021). Effects of smart city service channel-and user-characteristics on user satisfaction and continuance intention. *Information Technology & People*, 34(1), 147-177. https://doi.org/10.1108/ITP-06-2019-0300

Agag, G., & El-Masry, A. A. (2016). Understanding consumer intention to participate in the online travel community and effects on consumer intention to purchase travel online and WOM: An integration of innovation diffusion theory and TAM with trust. *Computers in Human Behavior*, 60, 97–111. https://doi.org/10.1016/j.chb.2016.02.038

Aji, H. M., Berakon, I., & Md Husin, M. (2020). COVID-19 and e-wallet usage intention: A multigroup analysis between Indonesia and Malaysia. *Cogent Business & Management*, 7(1), 1804181. https://doi.org/10.1080/23311975.2020.1804181

Alchemer, Apr 2023. Average retention rate of travel, tourism, and hospitality apps worldwide in 2022. 2023 Mobile Customer Engagement Benchmark Report, page 73. Retrieved April, 2023 from

https://www.statista.com/statistics/1230130/retention-rate-travel-apps-globally/

Alharahsheh, H. H., & Pius, A. (2020). A review of key paradigms: Positivism VS interpretivism. *Global Academic Journal of Humanities and Social Sciences*, 2(3), 39-43. https://gajrc.com/media/articles/GAJHSS_23_39-43_VMGJbOK.pdf

Ali, M., Raza, S. A., Puah, C. H., & Amin, H. (2019). Consumer acceptance toward takaful in Pakistan: An application of diffusion of innovation theory. *International Journal of Emerging Markets*, 14(4), 620-638. https://doi.org/10.1108/IJOEM-08-2017-0275

Alnawas, I., & Aburub, F. (2016). The effect of benefits generated from interacting with branded mobile apps on consumer satisfaction and purchase intentions. *Journal of Retailing and Consumer Services*, 31, 313–322. https://doi.org/10.1016/j.jretconser.2016.04.004

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Antón, C., Camarero, C., & Rodríguez, J. (2013). Usefulness, Enjoyment, and Self-Image Congruence: The Adoption of e-Book Readers. *Psychology & Marketing*, 30(4), 372–384. https://doi.org/10.1002/mar.20612

Ariel, Y., & Avidar, R. (2015). Information, interactivity, and social media. *Atlantic Journal of Communication,* 23(1), 19-30. DOI: 10.1080/15456870.2015.972404

Apple (2008). iPhone 3G on sale tomorrow. Retrieved from http://www.apple.com/pr/library/2008/07/10iPhone-3G-on-Sale-Tomorrow.html. Accessed on July 22, 2018

Awais, S., Yasin, Dr. Z., & Raza, F. (2022). Impact of Mobile Application Compatibility, Online Shopping and Payment on the User Satisfaction in Pakistan Context: Mediating role of Social Networking Site Adoption. *Journal of Management Practices, Humanities and Social Sciences,* 6(1). https://doi.org/10.33152/jmphss-6.1.4

Aydin, G., & Karamehmet, B. (2017). A comparative study on attitudes towards SMS advertising and mobile application advertising. *International Journal of Mobile Communications,* 15(5), 514. https://doi.org/10.1504/IJMC.2017.086366

Bae, M. (2018). Understanding the effect of the discrepancy between sought and obtained gratification on social networking site users' satisfaction and continuance intention. *Computers in Human Behavior*, 79, 137–153. https://doi.org/10.1016/j.chb.2017.10.026

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74–94. https://doi.org/10.1007/BF02723327

Baharuddin, R., Singh, D., & Razali, R. (2013). Usability dimensions for mobile applications-a review. *Res. J. Appl. Sci. Eng. Technology*, 5(6), 2225-2231.

Bernritter, S. F., Okazaki, S., & West, D. C. (2022). Mobile technology and advertising: Moving the research agenda forward. *Journal of Advertising*, 51(4), 407-410. https://doi.org/10.1080/00913367.2022.2089407

Byrne, B. M. (2001). Structural equation modelmg with AMOS: Basic concepts, applications and programming Mahwah, NJ: Erlbaum. https://doi.org/10.1207/S15327574IJT0101_4

Carson, D., Gilmore, A., Perry, C., & Gronhaug, K. (2001). *Qualitative marketing research*. Sage.

Chakraborty, G. S. (2005). Understanding corporate B2B web sites' effectiveness from North American and European perspectives. *Industrial Marketing Management*, 420-429. https://doi.org/10.1016/j.indmarman.2004.09.008

Chaouali, W. (2016). Once a user, always a user: Enablers and inhibitors of continuance intention of mobile social networking sites. *Telematics and Informatics*, 33(4), 1022-1033. https://doi.org/10.1016/j.tele.2016.03.006

Chen, S. et al. (2020) ‘Bibliometric and visualized analysis of mobile technology in Tourism’, Sustainability, 12(19), p. 7975. https://doi.org/10.3390/su12197975

Chen, S. C., Li, S. H., Liu, S. C., Yen, D. C., & Ruangkanjanases, A. (2021). Assessing determinants of continuance intention towards personal cloud services: Extending utaut2 with technology readiness. Symmetry, 13(3), 467. https://doi.org/10.3390/sym13030467

Chen, Y., Lin, Z., Filieri, R., & Liu, R. (2021). Subjective well-being, mobile social media and the enjoyment of tourism experience: a broaden-and-build perspective. *Asia Pacific Journal of Tourism Research*, 26(10), 1070-1080. https://doi.org/10.1080/10941665.2021.1952285

Cheng, S. & Cho, V. (2010). An integrated model of employees’ behavioral Intention toward innovative information and communication technologies in travel agencies. *Journal of Hospitality & Tourism Research*, 35 (4), 488-510. https://doi.org/10.1177/1096348010384598

Chiu, C. M., Wang, E. T., Fang, Y. H., & Huang, H. Y. (2014). Understanding customers' repeat purchase intentions in B2C e-commerce: the roles of utilitarian value, hedonic value and perceived risk. *Information systems journal*, 24(1), 85-114. https://doi.org/10.1111/j.1365-2575.2012.00407.x

Cho, Y. C., & Sagynov, E. (2015). Exploring Factors That Affect Usefulness, Ease Of Use, Trust, And Purchase Intention In The Online Environment. *International*

Journal of Management & Information Systems (IJMIS), 19(1), 21. https://doi.org/10.19030/ijmis.v19i1.9086

Choi, E.-K. (Cindy), Fowler, D., Goh, B., & Yuan, J. (Jessica). (2016). Social Media Marketing: Applying the Uses and Gratifications Theory in the Hotel Industry. *Journal of Hospitality Marketing & Management*, 25(7), 771–796. https://doi.org/10.1080/19368623.2016.1100102

Choi, H.-S., Lee, H.-K., & Ha, J.-C. (2012). The influence of smartphone addiction on mental health, campus life and personal relations - Focusing on K university students. *Journal of the Korean Data and Information Science Society*, 23(5), 1005–1015. https://doi.org/10.7465/jkdi.2012.23.5.1005

Choi, Y., Hickerson, B., & Kerstetter, D. (2018). Understanding the sources of online travel information. *Journal of travel research*, 57(1), 116-128. https://doi.org/10.1177/004728751668383

Creswell, J. W. (2002). Educational research: Planning, conducting, and evaluating quantitative (p. 676). Upper Saddle River, NJ: Prentice Hall.

Crotty, M. J. (1998). The foundations of social research: Meaning and perspective in the research process. The foundations of social research, 1-256.

COM, (November 13, 2001). Working together for the future of European tourism, COMMISSION OF THE EUROPEAN COMMUNITIES. Retrieved from:

https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2001:0665:FIN:en:PDF

COSME, (2018). COSME: Seven years supporting the growth of EU Tourism. European Innovation Council and SMEs Executive Agency (EISMEA). 31 May 2021. Retrieved from: https://eismea.ec.europa.eu/news/cosme-seven-years-supporting-growth-eu-tourism-2021-05-31_en

DeLone, W. H., & McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research*, 3(1), 60–95. https://doi.org/10.1287/isre.3.1.60

Digital Turbine, 2022. Share of time spent daily using selected app categories for mobile users in Europe, the Middle East, and Africa in 2nd quarter 2022. Retrieved Jun 2022 from https://www.statista.com/statistics/1325734/time-spent-app-emea-by-category/

Dirin, A., Laine, T., & Alamäki, A. (2018). Managing emotional requirements in a context-aware mobile application for tourists.

Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of marketing research*, 28(3), 307-319. https://doi.org/10.1177/002224379102800305

Dorcic, J., Komsic, J., Markovic, S. (2019). Mobile technologies and applications towards smart tourism state of the art. *Tourism Review*, 47(1), 82-103.

https://www.emerald.com/insight/content/doi/10.1108/TR-07-2017-0121/full/html

Duan, W., Yu, Y., Cao, Q., & Levy, S. (2016). Exploring the impact of social media on hotel service performance: A sentimental analysis approach. *Cornell Hospitality Quarterly*, 57(3), 282-296. https://doi.org/10.1177/19389655156204

Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2012). *Management research*. Sage.

El-Haddadeh, R., Weerakkody, V., Osmani, M., Thakker, D., & Kapoor, K. K. (2019). Examining citizens' perceived value of the internet of things technologies in facilitating public sector services engagement. *Government Information Quarterly*, 36(2), 310–320. https://doi.org/10.1016/j.giq.2018.09.009

Eriksson, P., & Kovalainen, A. (2015). Qualitative methods in business research: A practical guide to social research. Sage.

Escobar-Rodriguez, T. & Carvajal-Trujillo, E. (2014). Online purchasing ticket for low cost carriers: An application of unified theory of acceptance and use of technology (UTAUT) model. *Tourism Management*, 43, 70-88 https://doi.org/10.1016/j.tourman.2014.01.017

ETC, (2023). News Article: European travellers opt for early summer trips to beat crowds and rising travel costs. European Travel Commission. Retrieve date:

13.04.2023. Retrieved from: https://etc-corporate.org/news/european-travellers-opt-for-early-summer-trips/

Europarl (2023). Fact Sheets on the European Union. European Parliament. Article 6(d) and Title XXII, Article 195 of the Treaty on the Functioning of the European Union (TFEU). Retrieved from: https://www.europarl.europa.eu/factsheets/en/sheet/126/tourism

Eytam, E., Tractinsky, N., & Lowengart, O. (2017). The paradox of simplicity: Effects of role on the preference and choice of product visual simplicity level. *International Journal of Human-Computer Studies*, 105, 43–55. https://doi.org/10.1016/j.ijhcs.2017.04.001

Farah, M. F., Hasni, M. J., & Abbas, A. K. (2018). Mobile-banking adoption: Empirical evidence from the banking sector in Pakistan. *International Journal of Bank Marketing*, 36(7), 1386-1413. doi:10.1108/ijbm-10-2017-0215.

Fang, J., Zhao, Z., Wen, C., & Wang, R. (2017). Design and performance attributes driving mobile travel application engagement. *International Journal of Information Management*, 37(4), 269–283. https://doi.org/10.1016/j.ijinfomgt.2017.03.003

Flurry (2011), iOS & Android apps challenged by Traffic Acquisition not Discovery, available at: http://blog.flurry.com/bid/76874/iOS-Android-Apps-Challenged-by-TrafficAcquisitionNot-Discovery (accessed 15 Feburary 2014).

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39. https://doi.org/10.2307/3151312

Fuller, C. M., Simmering, M. J., Atinc, G., Atinc, Y., & Babin, B. J. (2016). Common methods variance detection in business research. *Journal of Business Research*, 69(8), 3192–3198. https://doi.org/10.1016/j.jbusres.2015.12.008

Gallego, M. D., Bueno, S., & Noyes, J. (2016). Second Life adoption in education: A motivational model based on Uses and Gratifications theory. *Computers & Education*, 100, 81–93. https://doi.org/10.1016/j.compedu.2016.05.001

Geng, L., Li, Y., Zhang, Y., Jiang, Z., & Xue, Y. (2023). Advancing tourism recovery through virtual tourism marketing: an integrated approach of uses and gratifications theory and attachment to VR. *Current Issues in Tourism*, 1-17. https://doi.org/10.1080/13683500.2023.2177834

Glover, P. (2010), Generation Y's future tourism demand: some opportunities and 82 challenges, in Benckendorff, P., Moscardo, G. and Pendergast, D. (Eds), Tourism and Generation Y, CAB International, Cambridge, MA, pp. 155-63. https://doi.org/10.1079/9781845936013.0155

Goel, P., Parayitam, S., Sharma, A., Rana, N. P., & Dwivedi, Y. K. (2022). A moderated mediation model for e-impulse buying tendency, customer satisfaction and intention to continue e-shopping. *Journal of Business Research*, 142, 1–16. https://doi.org/10.1016/j.jbusres.2021.12.041

Ha, Y. W., Kim, J., Libaque-Saenz, C. F., Chang, Y., & Park, M. C. (2015). Use and gratifications of mobile SNSs: Facebook and KakaoTalk in Korea. *Telematics and Informatics*, 32(3), 425-438. https://doi.org/10.1016/j.tele.2014.10.006

Hassan, A., & Sharma, A. (Eds.). (2020). The Emerald handbook of ICT in tourism and hospitality. Emerald Publishing Limited. https://www.researchgate.net/publication/347496102_Role_of_Mobile_Technology_for_Tourism_Development

He, Z., Wu, L., & Li, X. R. (2018). When art meets tech: The role of augmented reality in enhancing museum experiences and purchase intentions. *Tourism Management*, 68, 127-139. https://doi.org/10.1016/j.tourman.2018.03.003

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Ho, H.-Y., & Syu, L.-Y. (2010). Uses and gratifications of mobile application users. 2010 *International Conference on Electronics and Information Engineering*, V1-315-V1-319. https://doi.org/10.1109/ICEIE.2010.5559869

Hsu, C., Chen, M., Chang, K., & Chao, C. (2010). Applying loss aversion to investigate service quality in logistics. *International Journal of Operations & Production Management*, 30(5), 508–525. https://doi.org/https://doi.org/10.1108/01443571011039605

Hudson, L., and Ozanne, J. (1988). Alternative Ways of Seeking Knowledge in Consumer Research. *Journal of Consumer Research*, 14(4), 508–521. https://academic.oup.com/jcr/article-abstract/14/4/508/1811971

Huertas-Valdivia, I., Rojo Gallego-Burín, A., Castillo, A., & Ruiz, L. (2021). Why don't high-performance work systems always achieve superior service in hospitality? The key is servant leadership. *Journal of Hospitality and Tourism Management*, 49, 152–163. https://doi.org/10.1016/j.jhtm.2021.09.007

Islam, R., Islam, R., & Mazumder, T. (2010). Mobile application and its global impact. *International Journal of Engineering & Technology*, 10(6), 72-78. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=9f842c8177eee41fd96348eb4a0ae8ad45807076

Itani, O. S., Kassar, A. N., & Loureiro, S. M. C. (2019). Value gets, value give: The relationships among perceived value, relationship quality, customer engagement, and value consciousness. *International Journal of Hospitality Management*, 80, 78-90. https://doi.org/10.1016/j.ijhm.2019.01.014

Jacobs, J. (2016). *The death and life of great American cities*. Vintage book edition (1992)

Jones, J. R., & Harter, J. K. (2005). Race effects on the employee engagement-turnover intention relationship. *Journal of Leadership & Organizational Studies*, 11(2), 78-88. https://doi.org/10.1177/107179190501100208

Jung, T., Chung, N. & Leue, M. C. (2015). The determinants of recommendation to use augmented reality technologies: The case of Korean theme park. *Tourism Management*, 49, 75-86. https://doi.org/10.1016/j.tourman.2015.02.013

Jun, J., Cho, I., & Park, H. (2018). Factors influencing continued use of mobile easy payment service: an empirical investigation. *Total Quality Management & Business Excellence*, 29(9-10), 1043-1057. https://doi.org/10.1080/14783363.2018.1486550

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of management journal*, 33(4), 692-724. https://doi.org/10.5465/256287

Kamboj, S., Sharma, M., & Sarmah, B. (2022). Impact of mobile banking failure on bank customers' usage behaviour: the mediating role of user satisfaction. *International Journal of Bank Marketing*, 40(1), 128–153. https://doi.org/10.1108/IJBM-10-2020-0534

Karjaluoto, H., Shaikh, A. A., Saarijärvi, H., & Saraniemi, S. (2019). How perceived value drives the use of mobile financial services apps. *International Journal of Information Management*, 47, 252-261. https://doi.org/10.1016/j.ijinfomgt.2018.08.014

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and Gratifications Research. *The Public Opinion Quarterly*, 37(4), 509–523. https://www.jstor.org/stable/2747854

Khatri, I. S. H. W. A. R. (2018). Innovation research in tourism business: A review from two decades of studies. *Journal of Tourism*, 19(1), 15-27. https://jothnbgu.in/article/jotVolXIXno22018.pdf#page=6

Khatri, I. (2019). Information technology in tourism & hospitality industry: A review of ten years' publications. *Journal of Tourism and Hospitality Education*, 9, 74-87.

Kim, Donghyun & Ammeter, Anthony. (2014). Predicting Personal Information System Adoption with an Integrated Diffusion Model. *Information & Management*. 51. 10.1016/j.im.2014.02.011.

Kim, E. (2021). In-store shopping with location-based retail apps: perceived value, consumer response, and the moderating effect of flow. *Information Technology and Management,* 22(2), 83–97. https://doi.org/10.1007/s10799-021-00326-8

Kim, J., Kim, P. B., Kim, J. E., & Magnini, V. P. (2016). Application of construal-level theory to promotional strategies in the hotel industry. *Journal of Travel Research*, 55(3), 340-352. https://doi.org/10.1177/0047287514550097

Kim, M. J., Lee, C.-K., & Contractor, N. S. (2019). Seniors' usage of mobile social network sites: Applying theories of innovation diffusion and uses and gratifications. *Computers in Human Behavior*, 90, 60–73. https://doi.org/10.1016/j.chb.2018.08.046

Kim, M. J., Lee, C.-K., & Preis, M. W. (2020). The impact of innovation and gratification on authentic experience, subjective well-being, and behavioral intention in tourism virtual reality: The moderating role of technology readiness. *Telematics and Informatics*, 49, 101349. https://doi.org/10.1016/j.tele.2020.101349

Kim, S., & Baek, T. H. (2018). Examining the antecedents and consequences of mobile app engagement. *Telematics and Informatics*, 35(1), 148–158. https://doi.org/10.1016/j.tele.2017.10.008

Kim, S., Baek, T. H., Kim, Y.-K., & Yoo, K. (2016). Factors affecting stickiness and word of mouth in mobile applications. *Journal of Research in Interactive Marketing*, 10(3), 177–192. https://doi.org/10.1108/JRIM-06-2015-0046

Kim, Y. H., Kim, D. J., & Wachter, K. (2013). A study of mobile user engagement (MoEN): Engagement motivations, perceived value, satisfaction, and continued engagement intention. *Decision Support Systems*, 56, 361–370. https://doi.org/10.1016/j.dss.2013.07.002

Kleijnen, M., de Ruyter, K., & Wetzels, M. (2007). An assessment of value creation in mobile service delivery and the moderating role of time consciousness. *Journal of Retailing*, 83(1), 33–46. https://doi.org/10.1016/j.jretai.2006.10.004

Ko, E., Kim, E. Y., & Lee, E. K. (2009). Modeling consumer adoption of mobile shopping for fashion products in Korea. *Psychology and Marketing*, 26(7), 669–687. https://doi.org/10.1002/mar.20294

Kumar, A. N. (2011). Error-flagging support and higher test scores. *In Artificial Intelligence in Education: 15th International Conference*, AIED 2011, Auckland, New Zealand, June 28–July 2011 15 (pp. 147-154). Springer Berlin Heidelberg. https://link.springer.com/chapter/10.1007/978-3-642-21869-9_21

Kuo, Y.-F., Wu, C.-M., & Deng, W.-J. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Computers in Human Behavior*, 25(4), 887–896. https://doi.org/10.1016/j.chb.2009.03.003

Law, R., Chan, I. C. C., & Wang, L. (2018). A comprehensive review of mobile technology use in hospitality and tourism. *Journal of Hospitality Marketing & Management*, 27(6), 626-648. https://doi.org/10.1080/19368623.2018.1423251

Lee, J. C., & Chen, X. (2022). Exploring users' adoption intentions in the evolution of artificial intelligence mobile banking applications: the intelligent and anthropomorphic perspectives. International *Journal of Bank Marketing*. https://doi.org/10.1108/IJBM-08-2021-0394

Lee, K. Y., Sheehan, L., Lee, K., & Chang, Y. (2021). The continuation and recommendation intention of artificial intelligence-based voice assistant systems (AIVAS): the influence of personal traits. *Internet Research*, 31(5), 1899–1939. https://doi.org/10.1108/INTR-06-2020-0327

Lee, W., & Shin, S. (2018). Effects of Product Smartness on Satisfaction: Focused on the Perceived Characteristics of Smartphones. *Journal of Theoretical and Applied Electronic Commerce Research*, 13(2), 1–14. https://doi.org/10.4067/S0718-18762018000200102

Li, H., Liu, Y., Xu, X., Heikkilä, J., & van der Heijden, H. (2015). Modeling hedonic is continuance through the uses and gratifications theory: An empirical study in online games. *Computers in Human Behavior*, 48, 261–272. https://doi.org/10.1016/j.chb.2015.01.053

Li, M., & Mao, J. (2015). Hedonic or utilitarian? Exploring the impact of communication style alignment on user's perception of virtual health advisory services. *International Journal of Information Management*, 35(2), 229–243. https://doi.org/10.1016/j.ijinfomgt.2014.12.004

Liftoff. (November 19, 2020). Retention rate on day 1 and day 30 of mobile app installs worldwide as of August 2020, by category [Graph]. In Statista. Retrieved December 11, 2021, from https://www.statista.com/statistics/259329/ios-and-android-app-user-retention-rate/

Lin, K.-Y., & Lu, H.-P. (2011). Intention to Continue Using Facebook Fan Pages from the Perspective of Social Capital Theory. Cyberpsychology, *Behavior, and Social Networking*, 14(10), 565–570. https://doi.org/10.1089/cyber.2010.0472

Lin, K.-Y., Wang, Y.-T., & Huang, T. K. (2020). Exploring the antecedents of mobile payment service usage. *Online Information Review*, 44(1), 299–318. https://doi.org/10.1108/OIR-05-2018-0175

Lin, T. T., Bautista, J. R., & Core, R. (2020). Seniors and mobiles: a qualitative inquiry of mHealth adoption among Singapore seniors. *Informatics for Health and Social Care*, 45(4), 360-373. https://doi.org/10.1080/17538157.2020.1755974

Liu, H., Shao, M., Liu, X., & Zhao, L. (2021). Exploring the Influential Factors on Readers' Continuance Intentions of E-Book APPs: Personalization, Usefulness, Playfulness, and Satisfaction. *Frontiers in Psychology*, 12. https://doi.org/10.3389/fpsyg.2021.640110

Ma, S., Zhang, S., Li, G., & Wu, Y. (2019). Exploring information security education on social media use. *Aslib Journal of Information Management*, 71(5), 618–636. https://doi.org/10.1108/AJIM-09-2018-0213

Marinković, V., Đorđević, A., & Kalinić, Z. (2020). The moderating effects of gender on customer satisfaction and continuance intention in mobile commerce: a UTAUT-based perspective. *Technology Analysis & Strategic Management*, 32(3), 306-318. https://doi.org/10.1080/09537325.2019.1655537

Maslowska, E., Malthouse, E. C., & Collinger, T. (2016). The customer engagement ecosystem. *Journal of Marketing Management*, 32(5-6), 469-501. https://doi.org/10.1080/0267257X.2015.1134628

Medeiros, M., Ozturk, A., Hancer, M., Weinland, J., & Okumus, B. (2022). Understanding travel tracking mobile application usage: An integration of self determination theory and UTAUT2. *Tourism Management Perspectives*, 42, 100949. https://doi.org/10.1016/j.tmp.2022.100949

Mehrad, J., & Tajer, P. (2016). Uses and gratification theory in connection with knowledge and information science: A proposed conceptual model. *International Journal of Information Science and Management (IJISM)*, 14(2).

Menon, D. (2022). Uses and gratifications of educational apps: A study during COVID-19 pandemic. *Computers and Education Open*, 3, 100076. https://doi.org/10.1016/j.caeo.2022.100076

Min, S., So, K. K. F., & Jeong, M. (2019). Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. *Journal of Travel & Tourism Marketing*, 36(7), 770-783. https://doi.org/10.1080/10548408.2018.1507866

Mohd Suki, N., & Mohd Suki, N. (2017). Flight ticket booking app on mobile devices: Examining the determinants of individual intention to use. *Journal of Air Transport Management*, 62, 146 154. https://doi.org/10.1016/j.jairtraman.2017.04.003

Moon, J. K. (2001). Extending the TAM for a WorldWide-Web Context. *Information & Management*, 217-230. https://doi.org/10.1016/S0378-7206(00)00061-6

Myers, G., & Scarinci, J. (2022). Consumers' Use of Smartphone Technology for Travel and Tourism in a COVID Era: A Scoping Review. *Journal of Resilient Economies*, 2, 169-180. https://doi.org/10.25120/jre.2.1.2022.3923

Neuhofer B, Buhalis D, Ladkin A (2014). A typology of technology-enhanced tourism experiences. *International Journal of Tourism Research* 16(4):340–350. https://doi.org/10.1002/jtr.1958

No, E., & Kim, J. K. (2014). Determinants of the adoption for travel information on smartphone. *International Journal of Tourism Research*, 16(6), 534-545. https://doi.org/10.1002/jtr.1945

Orden-Mejía, M., & Huertas, A. (2022). Analysis of the attributes of smart tourism technologies in destination chatbots that influence tourist satisfaction. *Current Issues in Tourism*, 25(17), 2854–2869. https://doi.org/10.1080/13683500.2021.1997942

Orlikowski, W. J., & Baroudi, J. J. (1991). Studying Information Technology in organizations: Research approaches and assumptions. *Information Systems Research*, 2(1), 1–28. https://pubsonline.informs.org/doi/abs/10.1287/isre.2.1.1

Pang, H. (2021). Identifying associations between mobile social media users' perceived values, attitude, satisfaction, and eWOM engagement: The moderating role of affective factors. *Telematics and Informatics*, 59, 101561. https://doi.org/10.1016/j.tele.2020.101561

Parapanos, D., & Michopoulou, E. (2023). Innovative mobile technology in hotels and the use of gamification. *Tourism Planning & Development*, 20(2), 162-187. https://doi.org/10.1080/21568316.2022.2107563

Parasuraman, A., & Grewal, D. (2000). The impact of technology on the quality-value-loyalty chain: a research agenda. *Journal Of the Academy Of Marketing Science*, 28(1), 168-174. https://doi.org/10.1177/0092070300281015

Paul, K., Kang, M., & Haile, T. T. (2020). Uses and gratifications in developing user satisfaction and positive electronic word of mouth (eWOM) on facebook: a cross cultural study between South Korea and Tanzania. *International Journal of Scientific and Technology Research*, 9(4), 460-470.

Pihlström, M. (2008). Perceived value of mobile service use and its consequences. Svenska handelshögskolan.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Polit, D. F. (2010). Essentials of nursing research. Printed in China.

Prakash, C., Yadav, R., Dangi, A., & Singh, A. (2023). Factor Analysis Approach to Study Mobile Applications' Characteristics and Consumers' Attitudes. In Computational Intelligence for Engineering and Management Applications: Select Proceedings of CIEMA 2022 (pp. 783-798). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-19-8493-8_69.

Preacher, K. J., & Hayes, A. F. (2008). Assessing mediation in communication research (pp. 13-54). London: The Sage sourcebook of advanced data analysis methods for communication research.

Prodanova, J., Ciunova-Shuleska, A., & Palamidovska-Sterjadovska, N. (2019). Enriching m-banking perceived value to achieve reuse intention. *Marketing Intelligence & Planning*, 37(6), 617–630. https://doi.org/10.1108/MIP-11-2018-0508

Puspitasari, I., Wiambodo, A. N. R., & Soeparman, P. (2021). The impact of expectation confirmation, technology compatibility, and customer's acceptance on e-wallet continuance intention. In AIP conference proceedings (Vol. 2329, No. 1, p. 050012). AIP Publishing LLC. https://doi.org/10.1063/5.0042269

Rahimizhian, S., Ozturen, A., & Ilkan, M. (2020). Emerging realm of 360-degree technology to promote tourism destination. *Technology in Society*, 63, 101411. https://doi.org/10.1016/j.techsoc.2020.101411

Rijsdijk, S. A., Hultink, E. J., & Diamantopoulos, A. (2007). Product intelligence: its conceptualization, measurement and impact on consumer satisfaction. *Journal of the Academy of Marketing Science*, 35(3), 340–356. https://doi.org/10.1007/s11747-007-0040-6

Rodríguez, B., Molina, J., Pérez, F., & Caballero, R. (2012). Interactive design of personalized tourism routes. *Tourism Management*, 33(4), 926-940. https://doi.org/10.1016/j.tourman.2011.09.014

Rogers, E. M. (1983). *Diffusion of Innovation Theory*. Free Press: New York. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203887011-36/diffusion-innovations-everett-rogers-arvind-singhal-margaret-quinlan

Rogers, E. M. (1995). *Diffusion of innovations.* Free Press: New York. https://link.springer.com/chapter/10.1007/978-3-642-79868-9_2

Rogers, E. M. (2003). *Diffusion of innovations.* Free Press: New York. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203887011-36/diffusion-innovations-everett-rogers-arvind-singhal-margaret-quinlan

Rojo, A., Llorens-Montes, J., & Perez-Arostegui, M. N. (2016). The impact of ambidexterity on supply chain flexibility fit. *Supply Chain Management: An International Journal*, 21(4), 433–452. https://doi.org/10.1108/SCM-08-2015-0328

Sanders, D. & LeClus, M. (2009). All weird up but not plugged in: An evaluation of tourism and leisure marketing students' expectations and experiences of lecture podcasting. *Journal of Hospitality and Tourism Management*, 16 (1), 94-101. https://doi.org/10.1375/jhtm.16.1.94

Santos, M.C., Veiga, C. and Águas, P. (2016), "Tourism services: facing the challenge of new tourist profiles", *Worldwide Hospitality and Tourism Themes*, Vol. 8 No. 6, pp.654-669. https://doi.org/10.1108/WHATT-09-2016-0048

Saunders, M., Lewis, P. & Thornhill, A. (2012). Research Methods for Business Students. 6th edition, Pearson Education Limited.

Schumacker, R. E., & Lomax, R. G. (2016). *A Beginner's Guide to Structural Equation Modeling*. Routledge Taylor & Francis Group. https://doi.org/10.1080/08824096.2016.1214121

Scotland, J. (2012). Exploring the Philosophical Underpinnings of Research: Relating Ontology and Epistemology to the Methodology and Methods of the Scientific, Interpretive, and Critical Research Paradigms. English Language Teaching, 5(9), pp.9-16. https://eric.ed.gov/?id=EJ1080001

Shaw, N., Eschenbrenner, B., & Brand, B. M. (2022). Towards a Mobile App Diffusion of Innovations model: A multinational study of mobile wallet adoption. *Journal of Retailing and Consumer Services*, 64, 102768. https://doi.org/10.1016/j.jretconser.2021.102768

Singh, S., Singh, N., Kalinić, Z., & Liébana-Cabanillas, F. J. (2021). Assessing determinants influencing continued use of live streaming services: An extended perceived value theory of streaming addiction. *Expert Systems with Applications*, 168, 114241. https://doi.org/10.1016/j.eswa.2020.114241

Statista Digital Market Insights. (June, 2019). Average duration of daily internet usage worldwide as of 1st quarter 2019, by age group and device(in hours.minutes). In Statista. Retrieved June 7, 2022, from https://www.statista.com/statistics/416850/average-duration-of-internet-use-age-device/

Statista Digital Market Insights. (November, 2022). Share of time spent daily using selected app categories for mobile users in Europe, the Middle East, and Africa in 2nd quarter 2022. In Statista. Retrieved Nov 23, 2022, from https://www.statista.com/statistics/1325734/time-spent-app-emea-by-category/

Statista Digital Market Insights. (March, 2023). Mobile internet usage penetration in Central & Western Europe from 2019 to 2028. In Statista. Retrieved March 21, 2023, from https://www.statista.com/forecasts/1138530/mobile-internet-penetration-forecast-in-central-and-western-europe

Statista Digital Market Insights. (April, 2023). Revenue of the travel apps market worldwide from 2018 to 2027(in billion U.S. dollars). In Statista. Retrieved June 1, 2023, from https://www.statista.com/forecasts/1309624/worldwide-revenue-of-travel-apps

Statista Digital Market Insights. (May, 2023). Share of users worldwide accessing the internet in 4th quarter 2022, by device. In Statista. Retrieved May 22, 2023, from https://www.statista.com/statistics/1289755/internet-access-by-device-worldwide/

Statista Digital Market Insights. (June, 2023). Revenue of mobile apps worldwide 2019-2027, by segment(in million U.S. dollars). In Statista. Retrieved June 2, 2023, from https://www.statista.com/forecasts/1262892/mobile-app-revenue-worldwide-by-segment

Stocchi, L., Pourazad, N., Michaelidou, N., Tanusondjaja, A., & Harrigan, P. (2021). Marketing research on Mobile apps: Past, present and future. *Journal of the Academy of Marketing Science*, 1-31. https://link.springer.com/article/10.1007/s11747-021-00815-w

Sukamolson, S. (2007). Fundamentals of quantitative research. Language Institute Chulalongkorn University, 1(3), 1-20.

Tan, G. W. H., Lee, V. H., Lin, B., & Ooi, K. B. (2017). Mobile applications in tourism: the future of the tourism industry?. *Industrial Management & Data Systems*, 117(3), 560-581. https://doi.org/10.1108/IMDS-12-2015-0490

Tarute, A., Nikou, S., & Gatautis, R. (2017). Mobile application driven consumer engagement. *Telematics and Informatics*, 34(4), 145–156. https://doi.org/10.1016/j.tele.2017.01.006

Techcrunch. (2015). Consumers spend 85% of time on smartphones in Apps, but only 5 Apps see heavy use. Retrieved from https://techcrunch.com/2015/06/22/consumers-spend-85-of-time-on-smartphones-in-apps-but-only-5-apps-see-heavy-use. Accessed on July 22, 2018.

The Radicati Group (2021). Forecast number of mobile devices worldwide from 2020 to 2025 (in billions)*. Retrieved on Mar 10, 2023 from https://www.statista.com/statistics/245501/multiple-mobile-device-ownership-worldwide/#:~:text=In%202021%2C%20the%20number%20of,devices%20compared%20to%202020%20levels.

Tran Le Na, N., & Hien, N. N. (2021). A study of user's m-wallet usage behavior: The role of long-term orientation and perceived value. *Cogent Business & Management*, 8(1). https://doi.org/10.1080/23311975.2021.1899468

Tsai, H. T., Chien, J. L., & Tsai, M. T. (2014). The influences of system usability and user satisfaction on continued Internet banking services usage intention: empirical evidence from Taiwan. *Electronic Commerce Research*, 14, 137-169.

Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS quarterly*, 695-704. https://doi.org/10.2307/25148660

UNWTO (United Nations World Travel Organization) (2019). International Tourism Highlights. , available at: https://www.eunwto.org/doi/pdf/10.18111/9789284421152

UNWTOa (July 21, 2021). Number of international tourist arrivals worldwide from 2010 to 2020, by region (in millions) [and has been added to the references list:Graph]. In Statista. Retrieved December 12, 2021, from https://www.statista.com/statistics/186743/international-tourist-arrivals-worldwide-byregion-since-2010/

UNWTOb (January 31, 2021). International tourist arrivals worldwide from 1990 to 2019, by region of origin (in millions) [Graph]. In Statista. Retrieved December 12, 2021, from https://www.statista.com/statistics/273694/international-tourist-arrivals-by-region-of-origin-worldwide/

Veeramootoo, N., Nunkoo, R., & Dwivedi, Y. K. (2018). What determines success of an e-government service? Validation of an integrative model of e-filing continuance usage. *Government Information Quarterly*, 35(2), 161–174. https://doi.org/10.1016/j.giq.2018.03.004

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478. https://doi.org/10.2307/30036540

Verkijika, S. F., & De Wet, L. (2019). Understanding word-of-mouth (WOM) intentions of mobile app users: The role of simplicity and emotions during the

first interaction. *Telematics and Informatics*, 41, 218–228. https://doi.org/10.1016/j.tele.2019.05.003

Vu, H. Q., Li, G., & Law, R. (2020). Cross-country analysis of tourist activities based on venue-referenced social media data. *Journal of Travel Research*, 59(1), 90-106. https://doi.org/10.1177/0047287518820194.

Waheed, M., Kaur, K., Ain, N., & Sanni, S. A. (2015). Emotional attachment and multidimensional self-efficacy: extension of innovation diffusion theory in the context of eBook reader. *Behaviour & Information Technology*, 34(12), 1147-1159. https://doi.org/10.1080/0144929X.2015.1004648

Wang, E. S.-T., & Chen, L. S.-L. (2012). Forming relationship commitments to online communities: The role of social motivations. *Computers in Human Behavior*, 28(2), 570–575. https://doi.org/10.1016/j.chb.2011.11.002

Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387. https://doi.org/10.1177/0047287511426341

Wang, C. (2014). Antecedents and consequences of perceived value in Mobile Government continuance use: An empirical research in China. *Computers in Human Behavior*, 34, 140–147. https://doi.org/10.1016/j.chb.2014.01.034

Wang, D., Xiang, Z., & Fesenmaier, D. R. (2016). Smartphone use in everyday life and travel. *Journal of Travel Resear*ch, 55(1), 52–63. https://doi.org/10.1177/0047287514535847

Wang, C., Teo, T. S. H., & Liu, L. (2020). Perceived value and continuance intention in mobile government service in China. *Telematics and Informatics*, 48, 101348. https://doi.org/10.1016/j.tele.2020.101348

Wang, W.-T., Ou, W.-M., & Chen, W.-Y. (2019). The impact of inertia and user satisfaction on the continuance intentions to use mobile communication applications: A mobile service quality perspective. *International Journal of Information Management*, 44, 178–193. https://doi.org/10.1016/j.ijinfomgt.2018.10.011

Wuryandari, N. E. R. (2021). Uses and Gratification on Virtual Purchase Behavior of Mobile Game Items: An Alternative Approach. *Journal of Economics, Finance And Management Studies*, 04(09). https://doi.org/10.47191/jefms/v4-i9-10

Xiang, Z., Wang, D., O'Leary, J. T., & Fesenmaier, D. R. (2015). Adapting to the internet: trends in travelers' use of the web for trip planning. *Journal of travel research*, 54(4), 511-527. https://doi.org/10.1177/0047287514522883

Xie, L., Guan, X., He, Y., & Huan, T. C. (2021). Wellness tourism: Customer-perceived value on customer engagement. *Tourism Review*, 77(3), 859-876. https://doi.org/10.1108/TR-06-2020-0281

Yang, H., Yu, J., Zo, H., & Choi, M. (2016). User acceptance of wearable devices: An extended perspective of perceived value. *Telematics and Informatics*, 33(2), 256–269. https://doi.org/10.1016/j.tele.2015.08.007

Yen, C., & Chiang, M.-C. (2021). Trust me, if you can: a study on the factors that influence consumers' purchase intention triggered by chatbots based on brain image evidence and self-reported assessments. *Behaviour & Information Technology*, 40(11), 1177–1194. https://doi.org/10.1080/0144929X.2020.1743362

Ying, T. (2014). Online networking in the tourism industry: A webometrics and hyperlink network analysis. *Journal of Travel Research*, 55 (1), 16-33. https://doi.org/10.1177/0047287514532371

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of marketing*, 52(3), 2-22. https://doi.org/10.1177/002224298805200302

Zhang, C.-B., Li, Y.-N., Wu, B., & Li, D.-J. (2017). How WeChat can retain users: Roles of network externalities, social interaction ties, and perceived values in building continuance intention. *Computers in Human Behavior*, 69, 284–293. https://doi.org/10.1016/j.chb.2016.11.069

Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of consumer research*, 37(2), 197-206. https://doi.org/10.1086/651257

APPENDIX

Questionnaire

Dear respondents

Thank you for agreeing to participate in this survey. My name is Şensev Payan İlkan, a Ph.D. student at the Eastern Mediterranean University, North Cyprus. I am carrying out a survey for my Ph.D. thesis. The survey is about the "**Impact of Mobile Application Characteristics on the Application Engagement and Intention for Continuing Use in Tourism**". You are required to be using/have used a mobile application for tourism purposes. It should take about 6 minutes to complete the survey.

The survey has been designed to collect information on:

- Simplicity, benefit, compatibility of the mobile application
- Playfulness, informativeness and social interaction of the mobile application
- Perceived value and satisfaction you receive from the mobile application.
- Engagement and intention to continuing use of the mobile application.

Your participation in this survey is completely voluntary and you may stop the survey at any time. Neither your name nor any other identifying information will be recorded on the survey, and your responses will be kept completely anonymous. There is no known risk involved in this. Prospective data related to your participation will be used for research purposes only.

If you have any questions, please feel free to contact me (sensev.alicik@emu.edu.tr or 630-1665) or the thesis supervisor Ali Öztüren (ali.öztüren@emu.edu.tr or 630-1683)

Şensev Payan İlkan

Ph.D Candidate

Department of Tourism Management

I have read and understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

_____

Date

_____

Researcher Signature

1.Please indicate your gender

- Male
- Female

2.Select the category that includes your age range.

- Under 20
- 20-29
- 30-39
- 40-49
- 50-59
- 60 or Above

3.Please select your country of residence
Select your answer (Dropdown menu with country names)
4.Please indicate your education level.

- Below or High School
- College
- University
- Graduate school or Higher

5.Please indicate your monthly household income

- Below 1000 Euro
- 1000-3000 Euro
- 3000-5000 Euro
- 5000 Euro or Above

6.Frequency of overseas travel in the last year.

- Less than 2 times
- 2-4 times
- 4-6 times
- 6-8 times
- More than 8 times

7.How many times do you usually travel per year (before Covid-19 Pandemic)?

- Less than 2 times
- 2-4 times
- 4-6 times
- 6-8 times
- More than 8 times

8.How long has it been since you started using a mobile travel application?

- Less than a year
- 1-2 years
- 3-4 years
- 5-6 years
- More than 6 years

9.Please select or type the mobile travel application you are using the most on your mobile device.

- AIRBNB
- BOOKING.COM
- CHECKMYTRIP

- EXPEDIA
- SKYSCANNER
- TRIPADVISOR
- TRIPIT
- Other

Please indicate your level of agreement or disagreement with each of these statements.

Rate your experience using the mobile tourism application in terms of simplicity, compatibility and benefit.

Items	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. The travel application is easy to use					
2. Learning how to use this travel app is easy for me.					
3. I would imagine that most people would learn to use this app very quickly.					
4. This travel app enhances my trip planning and traveling experience.					
5. This travel app makes it easier to understand destinations.					
6. This travel app helps me save much time.					
7. This travel app makes trip planning and traveling more effective..					
8. This travel app is compatible with my travel preferences					
9. This travel app suits my travel needs.					
10. This travel app fits well with my travel needs.					

Rate your experience using the mobile tourism application in terms of playfulness, informativeness and social interaction.

Items	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. Using this travel app is enjoyable for me.					
2. Using this travel app is pleasurable for me.					
3. Using this travel app is fun for me.					
4. Using this travel app keeps me happy.					
5. I appreciate various things about the travel app.					
6. I have a variety of experiences while using the travel app.					
7. I get varied knowledge from using the travel app.					
8. I collect diverse information from using the travel app.					
9. Using the travel app enables me to create social relationships with other users					
10. Using the travel app helps me maintain social relationships with others.					
11. Using the travel app helps me make new friends					
12. Using the travel app enhances my social relationships with others					

Rate your experience using the mobile tourism application in terms of perceived value, user satisfaction, application engagement and intention to continuing use.

Items	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. The travel app on my mobile device is saving my time.					
2. The travel app on my mobile device allows me to identify the precise thing which I'm looking for.					
3. The travel app on my mobile device provides more options in terms of the trip planning.					
4. I am satisfied with the travel app.					
5. The travel app has met my expectations.					

6. My experience with the travel app is very pleasing.					
7. The travel app does a satisfactory job of fulfilling my needs.					
8. Whenever I have to use a travel app, I usually use this app.					
9. I am passionate about this mobile app.					
10. I love this mobile app.					
11. I am excited when using this mobile app.					
12. I am proud of using this mobile app.					
13. I think that I would use this mobile application in the future.					
14. I like to use this mobile application.					
15. I tend to leave positive comments about this mobile application.					
16. I think this mobile application is the best out of similar ones.					
17. I would like to use this mobile application in the future.					
18. I would recommend this mobile application for my family and friends.					

Additional comment: