

# **Travel app shopping: Understanding the success factors influencing in-app travel purchase intentions**

## **Abstract**

**Purpose** - While many benefits are purported by travel app developers, there is scant research on the factors driving behaviour when using travel apps. With the diffusion of innovation theory (DOI) and theory of planned behaviour (TPB) as the guiding theoretical perspectives, this research identifies the factors motivating user attitudes and in-app purchase intentions. The moderating impact of user inertia towards TPB constructs was also explored.

**Design/methodology/approach** - A total of 500 responses were received via an online-survey fielded from July to October 2021. The data were then analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM).

**Findings** - The results indicated that attitudes toward travel app shopping were predominantly determined by perceived relative advantages, compatibility, and complexity. While findings also suggested that in-app purchase intentions are positively influenced by attitudes, communicability, and perceived behavioural control, and are moderated by user inertia.

**Originality/Value** - A holistic framework integrating theoretical foundations from two disciplines (information systems and psychology) was designed to explain factors motivating user intentions to purchase travel products and services from apps. This research found a missing link in previous studies by showing the indirect role of attitudes that bridges the diffusion of innovation (DOI) and theory of planned behaviour (TPB), and the importance of inertia as a key boundary condition.

**Keywords** Travel apps; diffusion of innovation theory; theory of planned behavior; purchase intentions; tourism; inertia

**Paper Type** Research Paper

## 1. Introduction

The use of travel application (hereafter app) is growing at a mind-boggling rate over the years, especially when travelers desire for “seamless travel experiences”. According to Travel Daily News (2021), travel apps that encompass all trip elements in a one-stop solution are going to be a key to enhancing travel experiences and confidence. In practice, there are two forms of travel apps that available to consumers: (i) single-use apps making it possible to book one type of tourism product; and (ii) multipurpose apps allowing the booking on different products (see Appendix 1). Despite about 90% of users prefer to research their vacations online (i.e., checking on travel restrictions, and half prefer to book hotels and tickets three months in advance of travel) (Travel Daily News, 2021) and with nearly 60% of smartphone users regularly using travel apps when planning trips (e-Marketer, 2016), travel providers are facing challenges in expanding business through travel apps. Several companies report that travel apps often fall short of expectations after investing much time and money (LinkedIn, 2019). This happens since about half of the users had uninstalled apps when systems were not performing well, or not keeping promises and users informed (Buhalis *et al.*, 2019; Buhalis, 2020). Only 58% and 62% of users rated hotel and airline apps as being user-friendly, much lower when compared to other apps (e.g., for banking, shopping, food delivery) (Business Traveller, 2019). In spite of the increase in interest and leads, the conversion rate of the travel app remains at the abysmal stage with only 0.7% which is lagging far behind compared to other digital selling formats, such as desktop (Deane, 2021). This situation raises two crucial questions for scholars to investigate further: (i) What are the factors that motivate users’ attitude towards app-travel shopping and their in-app purchase behaviour? and (ii) What are the boundary conditions that would significantly enhance in-app purchase intentions?

Related research in this domain focuses on narrower themes such as satisfaction, intention to adopt, user engagement, and continuing use intentions (Choi *et al.*, 2019; Ali *et al.*, 2021), yet minimal attention has been given on purchase intentions using the travel apps. A similar concern was drawing in previous studies, including, Coves-Martínez *et al.* (2021) reflected that more research on user motivations for purchasing travel online was largely absent and much needed. Amaro and Duarte (2015) stated that existing research involving online travel buying had conflicting results and was fragmented. In addition, it is also necessary and worth examining how the adoption of travel app can affect marketing results (i.e., the intention to purchase from the platform) (Yu and Huang, 2022; Chen

*et al.*, 2021). This phenomenon arises as when travel providers introduce a travel app their utmost goal is to improve their competitive advantage, create a positive impact on users' purchasing behaviour and accelerate growth. Although both usage and purchase reflect users' behaviour, they are different in terms of definition and application. Usage behavior generally refers to readiness and willingness to adopt/use a technology system, purchase intention, by contrast, refers to the possibility of making decision to purchase an item (Venkatesh *et al.*, 2012; Vahdat *et al.*, 2021). Also affirmed that it is important to investigate the feasibility of users' purchase intention from an innovative technology system to gain excellent marketing results (Rauschnabel *et al.*, 2017). This is because buying on the platform is the primary initiator that helps service providers maintain the system and derive monetary benefit from the huge investment (Jang *et al.*, 2018). In light of the above concerns, it raises the importance of this study to explore on how users' perception of the travel app will influence their in-app purchase intention.

Based on data collected from travel app users in an emerging country, i.e. Malaysia, this study is expected to offer few insightful results to the field of research. First, we propose an integrated framework blending the diffusion of innovation theory (DOI) and theory of planned behavior (TPB) to examine the factors affecting user attitudes towards travel app shopping and in-app purchase intentions. The proposed model aims to extract the validity, parsimony and reliability offered by these theories, which enhance the explanatory and predictive power of behavioral constructionism in understanding both system and human perceptions in the network (Amaro and Duarte, 2015; Li *et al.*, 2021). Based on this integrative approach, this study goes beyond identify the factors that will have a significant impact on users' attitudes to the use of the travel app, but also those that would have a positive impact on their intention to book the travel product/service from the app. In practice, this aspect would offer travel providers with salient understanding on user behavior and perceptions that are essential for successful implementation of travel app strategies and converting potential customers into actual customers.

Second, this study an original contribution by exploring inertia as a potential contingency factor that impacts intentions to purchase. Several studies have found that inertia is a consumption trait that significantly influences purchasing and switching behaviour (Cao *et al.*, 2020; Han *et al.*, 2011; Henderson *et al.*, 2021). This is a concern for travel apps that are recently introduced reservation platforms and are still in the embryonic stage when compared to travel intermediaries and websites (Mu *et al.*, 2021). Although apps offer numerous benefits to users, including the richness of

information; 24/7 availability; a wider variety of product choices; and cost savings (Amaro and Duarte, 2015; Buhalis, 2003), it seems that not all users eventually purchase online. Thus, the number of “lookers” does not translate into an adequate number of “bookers” (Morrison *et al.*, 2001). The IS literature also finds inertia to be an inhibitor and underlying reason for consumer resistance when facing a new choice such as using a new application (Gong *et al.*, 2020; Delgosha and Hajiheydari, 2020). The evidence further indicates that individuals are resistant to change or to be involved in reorganization processes if the changes are expected to disrupt their psychological balance (Ram, 1987). However, there have been limited studies examining the moderating effects of inertia on the formation of purchase intentions concerning TPB constructs. By exploring this factor, the findings would provide insights for travel providers to implement appropriate marketing tactics that can constantly arouse user’s interest in purchasing from the app.

## **2. Theoretical Foundations**

Myriad theoretical models have been available to study mobile app’s adoption, usage, and acceptance to realize the value of new technology investment. For instance, McLean’s (2018) work adopted TAM model to understand the effects of perceived usefulness and perceived ease of use on mobile app engagement, Arfi *et al.* (2021) enrich the mobile app research by using an integrative UTAUT model, Chopdar *et al.* (2022) proposed a model to examine impulsive habit among app users from the lens of S-O-R model. Compared to those models of technological adoption, the Diffusion of Innovation Theory (DOI) seems to provide a better understanding and explanatory power to predict user adoption processes and decisions (Min *et al.*, 2019; Lee *et al.*, 2011), since it incorporates explanations from the social and psychological viewpoints. While theory of planned behavior (TPB) (Ajzen, 1991) is one of the pioneering and parsimonious models when it comes to understanding users' purchase decision on tourism and hospitality products that influenced by a series of psychological factors including traveler motivations, beliefs, social status, perceptions, and emotions (Ulker-Demirel and Ciftci, 2020; Yuzhanin and Fisher, 2016).

### ***2.1 Diffusion of Innovation Theory (DOI)***

The DOI theory introduced by Rogers (1983) is used to describe the beliefs, structures, and processes when people adopt innovations. An innovation is “an idea, practice, or object that is perceived as new by an individual or other adoption unit” (Rogers, 2003, p. 12). Five features of innovations are

suggested to encourage users to overcome uncertainty through the adoption of new technology: (i) relative advantage (perceived economic or benefits gains); (ii) compatibility (perceived coherence with the values and beliefs of adopters); (iii) observability (the extent to which innovation results are visible to others); (iv) complexity (perceived level of difficulty in understanding and using an innovation); and (v) trialability (the possibility of experiencing innovation before accepting it) (Rogers, 1995).

Several studies have applied DOI to explore user behaviour in adopting cutting-edge technologies. Min *et al.* (2019) investigated the factors influencing user adoption of Uber mobile apps. Ling *et al.* (2021) applied DOI to elucidate the determinants of smart speaker purchases. Hong *et al.* (2017) adopted this theory to explore the reasons driving individuals to continue using smartwatches. While the adoption of innovations is said to be influenced by five classical factors, some components (i.e., observability and trialability) are found to create nuisance in predicting intentions and are less significant when explaining the adoption of certain tourism innovations (Dillon & Morris, 1996; Papies & Clement, 2008). Some recent studies have consistently shown that relative advantages, complexity, and compatibility are three critical factors in predicting the use of tourism devices including travel apps, travel agent systems, and sustainable technologies (Wang *et al.*, 2018; Smerecnik & Andersen, 2011; Hung *et al.*, 2011). Thus, these three features deserve further study, particularly on how user perceptions of travel apps are influenced.

## *2.2 Theory of Planned Behaviour*

TPB is a widely used model to predict how human behaviour is formed by attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). Intention represents an individual expectation of behaviour in a particular environment and can be explained as the probability of acting and as an immediate determinant to stimulate desirable behaviour (Fishbein & Ajzen, 1975; Yuzhanin & Fisher, 2016). Attitudes are the positive (negative) assessment of a person's self-performance of a particular behaviour. Subjective norms are perceptions people have of the normative social pressure to perform a certain behaviour. Perceived behavioral control (PBC) involves beliefs about the presence of factors that facilitate (or impede) behavioral performance. Thus, it is particularly crucial in defining behaviors that are mainly controlled by volition (Ajzen, 1991; Yuzhanin & Fisher, 2016).

Empirically, this theory has been broadly used by tourism researchers in predicting the behaviour of tourists, such as choice of destination, accommodation decision and transport selection (Pan and Truong, 2018; Liu et al., 2021; Wang and Wong, 2020). Given the research focus on the factors that motivate users to purchase travel through apps, any insight into how individuals evaluate apps will be critical to achieving the objectives. Therefore, it is envisaged that the use of TPB is suitably to understand how the attitudinal judgements towards the travel app will associated with intention to purchase from the platform.

### **3. Hypotheses Development**

#### *3.1 Drivers of Attitude*

##### *3.1.1 Perceived Relative Advantages*

Perceived relative advantages reflect the degree to which an innovation is perceived to be better than a predecessor (Chen & Hung, 2010; Rogers, 1995). The use of travel applications is providing more significant advantages over non-digital sales formats such as printed documents, personal phone calls and on-site interaction with travel agents (Wang, 2019; Fang et al., 2017). The innovation of travel apps such as location-based recommendations, easier booking under one roof, and customized and personalized services have fundamentally revolutionized the way travel providers connect and interact with their customers (Lu et al., 2015; Ali et al., 2021). The relative advantage may be paralleled to the balance of contradictory forces, articulated as motives to stimulate positive perceptions towards an innovation (Karayanni, 2003; Mombeuil & Uhde, 2021). Thus, if the users think that they will gain more benefits from purchasing using travel apps than other platforms, this option is more likely to be used for future purchases.

The literature indicates several advantages of app use including time-saving, financial advantages, convenience, product variety, and enjoyment (Cho and Agrusa, 2006; Cobanoglu and Cummings, 2004). Consistent with past studies (Law *et al.*, 1998; Amaro and Duarte, 2015), this research defined perceived relative advantages as a multidimensional construct consisting of these five benefits. It is believed that this concept is theoretically significant and parsimonious, as well as being a representation of the benefit dimensions.

Mobile apps are emerging as an effective means for engaging with companies and receiving the latest promotional notifications and special deals (Swani, 2021). They allow users to personalize purchases, as apps provide opportunities to communicate with companies in real time (Vahdat *et al.*, 2021). Adding mobile apps has opened up a new world of functionality and productivity, as users can search for information with a click of a button while increasing interactions with companies (Mehra *et al.*, 2020; Lim *et al.*, 2021). If travel apps are properly implemented, they are a new communication channel for travel providers to increase business and complement existing means of distribution. Thus, it is reasonable to expect that the considerable perceived relative advantages of travel apps will positively influence user attitudes towards app-travel shopping. Accordingly, it was proposed that:

*H<sub>1a</sub>: Perceived relative advantages of travel apps positively influence attitudes towards app-travel shopping.*

### **3.1.2 Perceived Compatibility**

Perceived compatibility is defined as “the degree to which an innovation is perceived to be well-suited with the values, lifestyles, experiences, and needs of individuals (Rogers, 2003, p. 15). Previous studies have consistently found that strong compatibility results in favorable degrees of technology usage, as it is observed that users form attitudes based on habits, beliefs and value systems when exposed to new technology (Yang *et al.*, 2016). Travel apps are multi-attribute platforms that save consumers time when searching for destination information, flights, and accommodation deals, and trip management (Choi *et al.*, 2019). Compared to traditional booking platforms, travel apps allow travel providers to stay connected with users, helping them complete bookings, which ultimately accelerate the booking time and make the experience more interactive (Fang *et al.*, 2017). As a result, users who perceive using travel apps to be compatible with their ways of life are more likely to form positive attitudes and, therefore, the following was hypothesized:

*H<sub>1b</sub>: Perceived compatibility of travel apps positively influences attitudes towards app-travel shopping.*

### **3.1.3 Perceived Complexity**

Perceived complexity related to “ease of use” and is defined as the extent to which an innovation is difficult to understand and use (Rogers, 1995). Complex innovations are seen as an obstacle to technology adoption, as consumers are generally inhibited to use device that requires more mental

effort or is time-consuming than expected (Li *et al.*, 2021). Complexity may lead to an unclear understanding of the technology's functions and performance, which, in turn, negatively influence overall evaluations and experiences. Studies have found that perceived complexity affects attitudes towards purchasing from online travel agencies (Huang and Mou, 2021) and travel websites (Amaro and Duarte, 2015). This research posits that users who perceive travel apps to have complex functions will have lesser positive attitudes towards app shopping and hence we hypothesized that:

*H<sub>1c</sub>: Perceived complexity of travel apps negatively influences attitudes towards app-travel shopping.*

### ***3.2 Drivers of in-app purchase intentions***

#### ***3.2.1 Attitudes***

Attitudes are cognitive, emotional, and affective reactions regarding a psychological object, act, or person. The significant relationship between attitudes and behavioural intentions has been documented in the TPB and evidenced in numerous works (Ajzen, 1991). Carter and Yeo's (2016) study on mobile apps showed that user purchase intentions were positively influenced by attitudes. This phenomenon can be explained due to: (i) people typically will not use an app if they have found the overall experience is highly interruptive; and (ii) mobile apps that are welcomed are expected to offer highly targeted experiences that are close to purchasing (Bianchi, 2021). Hsu and Lin (2016) demonstrated that positive attitudes towards apps increase the number of times people access the app and increases platform purchasing intentions. Consequently, it is suggested that users who exhibit positive attitudes towards travel apps, will have higher in-app purchase intentions:

*H<sub>2</sub>: Attitudes positively influence in-app purchase intentions.*

#### ***3.2.2 Communicability***

According to Morrison *et al.* (2001), communicability relates to the influence of family and friends (a different form of social influence) on individual online activities, in the sense that one will be more likely to book travel online if they know that the people close to them are doing the same. Such a concept is similar to the notion of "subjective norms" in TPB, but it limits the influence within those who are closer (Amaro and Duarte, 2015). The study by Venkatesh and Davis (2000) argued that one should avoid using pervasive factors like subjective norms because they can only capture intention effects based on mandatory usage contexts, and not when the usage is voluntary. Hence,



this study used communicability as a specific factor to investigate the effect of social influences on travel purchase intentions using the app.

The existing literature indicates that social influences play a significant role in affecting the way individuals make purchase decisions when using a new system (Fan *et al.*, 2019). The information shared among family and friends is a credible source for influencing travel decisions, as for the user, these recommendations are considered to be more reliable, up-to-date, and more attractive (Buhalis and Foerste, 2015; Kim *et al.*, 2021). This information is perceived important especially in the early stages of decision-making to minimize the risk of making wrong decisions because of the nature of highly priced tourism products, require high involvement, and are difficult to differentiate (Buhalis and Sinarta, 2019; Öz, 2015). These findings lend credence to the notion that communicability is a key element influencing in-app purchase intentions and thus:

*H<sub>3</sub>: Communicability positively influences in-app purchase intentions.*

### **3.2.3 Perceived Behavioral Control (PBC)**

PBC is the belief of the ease or difficulty to execute a behavior, where the level of confidence in carrying out actions is expected to increase if people believe they have sufficient resources and opportunities to overcome potential obstacles (Nimri *et al.*, 2020; Sun *et al.*, 2020). Ajzen (2002) proposed that PBC has two components: self-efficacy and controllability. Self-efficacy indicates the belief in one's ability to succeed or accomplish an online purchase, while controllability represents an individual's judgment about the availability of resources and opportunities to purchase online (Pavlou & Fygenson, 2006; Vijayasathy, 2004).

As the functions of technological tools become less complex, effortless, and more familiar, users perceive increasing self-efficacy and controllability (Gefen *et al.*, 2003; Hernandez *et al.*, 2009). Amaro and Duarte (2015) found those individuals who acquired sufficient technology capabilities and resources had greater intentions to make online travel purchases. Kim *et al.* (2021) determined that perceived behavioural control was a major factor when predicting intentions to continue mobile shopping. Ruiz-Mafe *et al.*'s (2013) study found that intention to purchase airline tickets online was predicted by levels of resources and online knowledge and skills. As a result, it is predicted that when users perceive that travel apps are within their control, the increased confidence positively influences acceptance of in-app purchase intentions. The hypothesis was proposed as follows:

*H4: PBC positively influences in-app purchase intentions.*

### ***3.3 Mediating Effect of Attitudes***

Attitudes are often treated as a psychological construct that plays a role in measuring why an object influences behavioral intentions (Jiang, Wang & Yuen, 2021). Excluding components like attitudes does not provide a complete picture of why users react in certain ways since this aspect consistently acts between causes and behavioral responses to affect overall judgments (Ajzen, 1991). Attitudes play a critical mediation role in understanding both the positive (i.e., perceived relative advantages and compatibility) and negative impacts (perceived complexity) influence intentions to purchase travel online (Amaro and Duarte, 2015). Reynolds and Ruiz de Maya (2013) determined that attitudes mediate positive (perceived usefulness) and negative impacts (task complexity) on revisit intentions for particular websites. Thus, it is useful to test whether attitudes explain why the components of DOI (i.e., perceived relative advantages, compatibility, and complexity) impact in-app purchase intentions. The following were proposed:

*H<sub>5a</sub>: Attitudes mediate the relationship between perceived relative advantages and in-app purchase intentions.*

*H<sub>5b</sub>: Attitudes mediate the relationship between perceived compatibility and in-app purchase intentions.*

*H<sub>5c</sub>: Attitudes mediate the relationship between perceived complexity and in-app purchase intentions.*

### ***3.4 Moderating Effect of Inertia***

Growing evidence indicates that inertia acts as a psychological switching barrier which often linked to monetary barriers and plays a moderating role in affecting buying processes (Gong *et al.*, 2020; Wang *et al.*, 2019). Kim and Kang (2016) argued that when users of mobile services are familiar with the functions and operating protocols of a service, they feel comfortable staying with the service to avoid spending more time and effort to learn new task, thus developing an emotional attachment to the current service.

Our research expected inertia to play a moderator role in the formation of in-app purchasing intentions, supported by the following justifications. First, although there is little finding specifically examining the moderating impact of inertia concerning TPB constructs, but there is considerable research indicating that inertia is a unique mentality that eliminates the need to consider any change

in consumption or make comparisons to alternatives once individuals have strong attitudes and beliefs towards certain objects (Wang *et al.*, 2020; Henderson *et al.*, 2021). Second, prior research pointed that inertia exhibits a significant anchor that influences user behaviour when faced with new information technology. For example, it was concluded that users often stick with status quo choices (i.e., inertia) rather than making new choices when assessing particular technologies (Polites and Karahanna, 2013). The status quo bias is common, and it occurs not only in the transition to accepting or switching but also in the different stages of use (Li *et al.*, 2021). Murray and Häubl (2007) found that inertia produced a cognitive lock-in effect that has a significant impact on online shopping by making even less satisfied users passively remain with current sellers, which ultimately reduced the switching rate.

Although studies have drawn attention to how consumption traits can be moderators, how inertia moderate in-app purchase intentions still require deeper examination. Based on the empirical evidence mentioned above, it is true that when the use of travel apps is relatively advantageous and practical, it is very unlikely that people will look for details on alternative platforms (e.g., travel website, travel agency, etc.). Hence, they might feel more comfortable using an existing app to search for and purchase travel products and services. Therefore, the following sub-hypotheses were developed:

*H<sub>6a</sub>: Inertia significantly moderates the relationship between attitudes and in-app purchase intentions, where the relationship becomes stronger when inertia is high.*

*H<sub>6b</sub>: Inertia significantly moderates the relationship between communicability and in-app purchase intentions, where the relationship becomes stronger when inertia is high.*

*H<sub>6c</sub>: Inertia significantly moderates the relationship between PBC and in-app purchase intentions, where the relationship becomes stronger when inertia is high.*

Since prior research in tourism field has also indicated significant differences for gender, age, ethnicity, and purpose of travel (Kai *et al.*, 2021; Schubert *et al.*, 2020), this study included these control variables to avoid any spurious explanations on the outcomes (i.e., in-app purchase intentions). The research model is presented in Figure 1.

[Insert Figure 1 here]

## **4. Method**

### ***4.1 Survey development and sampling***

An online survey using Google Forms was used to address the research hypotheses. Two screening questions were set to gather the data using purposive sampling technique: (1) have you used any travel apps; and (2) after the reopening of domestic travel, would you start to purchase travel products and services using apps? Those respondents who answered in the negative for both questions were not included in the study.

The survey link was sent to the target respondents through social media platforms including Facebook Messenger, WhatsApp, Instagram, and LinkedIn, which are often used by the population in Malaysia (Statista, 2021). Disseminating the survey via social media was the most effective given impact by COVID-19 lockdowns, where outdoor activities were reduced and social distancing was maintained to prevent the spread of the virus (see Kanwal, Rasheed, Pitafi, Pitafi, & Ren, 2020; Zheng, Luo, & Ritchie, 2021). In the invitation message, respondents were informed of the purpose of the research, the time to complete the survey, and obtained their consent to participate in this survey. Travel apps were defined as mobile apps that serve the needs of users at different stages from pre-travel, during-travel to post-travel. Examples provided were popular travel apps in Malaysia including Tripadvisor, Booking.com, and Agoda.

During the data collection from July to October 2021, the online survey resulted in 535 responses, but 35 responses were discarded due to straight-lining issue. The final dataset of 500 observations provided an 0.15 effect size and a power level of 80% in the post-hoc power analysis (Fink, 2017). The sample primarily consisted of Malays, female travelers, with a tertiary education, aged between 21 and 30 years with a monthly income of US\$500 to US\$750. About 60% of the respondents brought travel products and services via apps for family-trip purposes and 27.6% preferred to used Klook (Table 1).

[Insert Table 1 here]

### ***4.2 Measures***

All measurement items were adapted from the extant literature and modified to fit the travel app context, and measure using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) (see Table 2). Attitudes were measured using Ajzen and Fishbein's (1980) scale. Perceived relative advantages were measured through five dimensions: convenience, time-saving, financial advantage,

product variety, and enjoyment adapted from Amaro and Duarte (2015). The two dimensions of PBC were controllability and self-efficacy as proposed by Pavlou and Fygenon (2006). Items used to measure communicability and perceived complexity were adapted from Li and Buhalis (2006) and Morrison et al. (2001). The scale of the perceived compatibility construct was modified from Vijayarathy (2004). In-app purchase intentions were based on Bigné et al.'s (2010) and Limayem et al.'s (2000) studies, while inertia is adapted from Han et al. (2018).

Before the actual data collection, all measurements were validated through two preliminary tests. First, for a pre-test a panel of ten respondents consisting of three postgraduate students and five adult volunteers who regularly purchased travel using app were invited to cross-check the sentence structure and for language errors. Second, for the pilot test, a group of 30 respondents were asked to carefully study and answer each item. All the constructs indicated acceptable reliability, as the Cronbach's Alpha values were above the acceptance range of 0.70. Some items underwent minor changes in terms of wording, as suggested by respondents based on the two preliminary tests.

## **5. Results**

### ***5.1 Data Analysis***

The PLS-SEM technique was utilized to analyze the proposed hypotheses. PLS-SEM employs a causal-predictive technique that allows researchers to maximize explanation and prediction, accompanied by meaningful practical implications for tourism and hospitality (Ali *et al.*, 2018; Uskali & Kucerkegin, 2018). With the SmartPLS software, the assessment process was divided into two phases: measurement and structural model (Hair et al., 2019).

### ***5.2 Common Method Bias***

Common method bias was addressed through both *a priori* and *post hoc* measures (Podsakoff, MacKenzie & Podsakoff, 2012). Procedural remedies consisted of questionnaire pre-testing, which examined the use of items and the questionnaire's design to minimize informant efforts to complete the survey; and only knowledgeable respondents who regularly used travel apps were targeted. The *post-hoc* measure using Harman single-factor analysis found a single factor accounted for only 30.03% of the total variance, which is less than 40% criteria (Fuller *et al.*, 2016). The full collinearity test showed that the variance inflation factor (VIF) values of all constructs ranged between 1.83 to 2.70

(below 3.33) (Table 2) (Kock and Lynn, 2012), suggesting that common method bias was not a significant concern.

### ***5.3 Measurement model***

In this study, all the constructs achieved satisfactory reliability, as the values of CR exceeded the threshold values of 0.70 (Hair, Ringle & Sarstedt, 2011). The convergent validity requirements were also met, where the AVE scores > 0.50 and loading values exceeded 0.708 (Fornell & Larcker, 1981). Next, from Table 3, the HTMT score for each latent construct <0.85, indicating acceptable discriminant validity (Henseler et al., 2015).

[Insert Table 2 and 3 here]

### ***5.4 Higher-Order Construct (HOC)***

A disjoin two-stage approach (Sarstedt *et al.* 2019) was undertaken to assess two HOC, i.e., (i) PBC with two sub-dimensions: self-efficacy and controllability; and (ii) perceived relative advantages with five sub-dimensions: convenience, time-saving, financial advantage, enjoyment, and product variety. The convergent validity's results showed that PBC ( $\beta = 0.945$ ) and perceived relative advantage ( $\beta = 0.872$ ) provided acceptable path coefficients. The outer weights of all the sub-dimensions were significant (p-values < 0.05), except for product variety, however, this dimension was retained due to its contribution to theory conceptualization (Hair *et al.*, 2018). Multicollinearity was not a concern as the VIF values were less than 3.33 (Diamantopoulos and Siguaw, 2006) (Table 4).

[Insert Table 4 here]

### ***5.5 Hypotheses Testing***

Bootstrapping with 5,000 samples indicated that all the proposed hypotheses were supported. Specifically, perceived relative advantages ( $\beta = 0.344$ ,  $t = 7.078$ ) and perceived compatibility ( $\beta = 0.357$ ,  $t = 6.660$ ) showed a positive relationship with attitudes, while a negative relationship was found for perceived complexity ( $\beta = -0.119$ ,  $t = 3.461$ ) (see Table 5). Additionally, attitudes ( $\beta = 0.439$ ,  $t = 7.258$ ), communicability ( $\beta = 0.144$ ,  $t = 2.994$ ), and PBC ( $\beta = 0.166$ ,  $t = 3.418$ ) were significantly associated with in-app purchase intentions. For the mediation analysis, attitudes were

found as a significant mechanism connecting between perceived relative advantages ( $\beta = 0.151, t = 4.639$ ), compatibility ( $\beta = 0.156, t = 5.239$ ) and complexity ( $\beta = -0.052, t = 3.056$ ) on in-app purchase intentions.

Using the latent interaction analysis technique, the ATT x Inertia ( $\beta = 0.114, t = 2.034$ ) and PBC x Inertia ( $\beta = 0.101, t = 1.741$ ) interactions were found to be significant influences on in-app purchase intentions (Table 5). From the interaction plots, it can be seen that the effect of attitudes and PBC as predictors of in-app purchase intentions were stronger among users with higher levels of inertia (see Figure 2). Thus, when the level of inertia increases, users with positive attitudes and PBC in using travel apps are more likely to purchase from the app platform. However, the results showed non-significance for the inertia effect on the relationship between communicability and in-app purchase intentions. Regardless of high or low inertia, it did not affect the relationship between communicability and intention.

The structural model demonstrated 46.60% of the variance in attitudes was accounted for by the combination of DOI constructs, i.e., perceived relative advantages, compatibility and complexity. The three main constructs of TPB, i.e., attitudes, communicability, and PBC as well as four non-significant control variables (i.e., gender, age, ethnicity, and purpose of travel) accounted for 44% of the variance in in-app purchase intentions. Last, blindfolding results showed that the  $Q^2$  for all the endogenous constructs  $>0$  indicating predictive relevance in explaining the endogenous constructs (i.e., attitudes = 0.341; in-app purchase intention = 0.346) (Chin et al. 2020).

[Insert Table 5 here]

[Insert Figure 2 here]

## **6. Discussions and Implications**

### ***6.1 Main findings***

Building on the frameworks of DOI (Rogers, 1983) and TPB (Ajzen, 1991), this research explored the determinants of attitudes towards travel app shopping and in-app purchase intentions. The results from a sample of 500 travel app users indicated support for most of the proposed hypotheses. Three innovation variables: relative advantages, compatibility, and complexity had a positive effect on attitudes (H1a, H1b, and H1c were supported). The relative advantages of travel apps were deemed useful when they provided people with product variety, enjoyment, convenience, time-savings, and

financial benefits (Law *et al.*, 1998; Amaro and Duarte, 2015). As in DOI theory, users are more likely to be attracted and impressed with innovations if they offer a variety of advantages (Mombeuil and Uhde, 2021; Jiang *et al.*, 2021). Perceived compatibility was the most important factor in affecting attitudes. This suggests that most respondents perceived using apps to book travel products and services as not being very different from reservations through travel agents, or felt that travel apps fully met needs like booking websites. As with the DOI theory and Amaro and Duarte's (2015) studies, individuals who are willing to integrate new practices into their travel planning show favorable attitudes towards newly introduced distribution channels. This confirmed that people who prefer and enjoy buying travel products with travel apps will continuously use them. Perceived complexity was found to significantly impact attitudes. Difficult and cumbersome processes (complexity) involved in using travel apps will hurt attitudes towards travel app shopping. If people perceive travel apps to be easy to operate, they will continue using it; whereas if functions are considered complicated, they will quit after using for some time. This finding corresponds with Adapa *et al.* (2020), who found that online selling technologies which are simpler and easy to operate are more likely to engage users and provide meaningful experiences.

As supported by the TPB, attitude, communicability, and PBC were positive predictors of in-app purchase intentions (H2, H3, and H4 were supported). When users have more positive attitudes about travel app shopping, they are more likely to book travel products and services through apps soon. This is in accordance with Bigné *et al.* (2010), who demonstrates that attitudes were the strongest predictors of intentions to purchase. The significant relationship between communicability and in-app purchase intention also confirms previous research that this is the important factor directly influencing intentions to purchase online (Morrison *et al.*, 2001). Users tend to rely heavily on interpersonal communication to obtain guidance and reduce uncertainty with travel bookings, as these products are mostly intangible and cannot be evaluated before consumption (Confente and Vigolo, 2018). Also, this study evidenced that both self-efficacy and controllability led to a better explanation, further confirming that an individual's PBC is influenced by internal and external factors (Davies *et al.*, 2002). Users with greater external (i.e., time, financial, stable Internet connection) and internal (i.e., technological competence and ability) resources are more motivated to purchase travel products and services through apps.

Attitudes towards travel app shopping are significant in connecting the relationship between perceived relative advantages, complexity, and compatibility for in-app purchase intentions (H5a,



H5b, and H5c were supported). In parallel with TPB (Ajzen, 1991) which have established the mediating role of attitudes between beliefs and behavioral intentions. The findings suggest that only when users have positive attitudes on travel app shopping, their perceptions of relative advantages, compatibility, and less complexity will then be fully translated into intentions to purchase through apps.

This research empirically tested the boundary condition of inertia in affecting purchase intentions. The results confirmed that users perceive their attitudes and PBC on intentions to purchase differently depending on the level of inertia (H6a and H6c were supported). The strength of these two direct relationships varied significantly according to the degree of inertia. Individuals with high inertia are those who feel switching to an innovation platform is too troublesome, irrespective of attitudes and appraisal of having the capability towards the use of travel app appear more likely to maintain their current purchase intentions than those with low inertia. Thus, the findings complement the work of Gong et al. (2020) which showed that inertia can prevail even when another platform (e.g., web service or alternate app) offers more attractive discounts, and most continue to use the incumbent platform. In contrast, the positive link between communicability and in-app purchase intentions was not moderated by inertia (H6b was rejected). This signifies that close families and friends exhibit a considerable influence on users' purchasing consciously and sub-consciously (Essiz and Mandrik, 2022).

## *6.2 Theoretical Implications*

While technology is recognized as a crucial element in facilitating seamless travel, research focused on perceptions of travel apps and in-app purchase intentions has received little attention, especially during the post-pandemic era. In response, this research incorporated interdisciplinary concepts into a unified model to shed further light on two research questions. It is argued that it is necessary to address key user concerns when adopting travel apps and, therefore, DOI theory (Rogers, 1983) was employed to understand the factors that enhance attitudes towards travel app shopping. Also, to address the concerns of Ulker-Demirel and Ciftci (2020) on the importance of understanding motivations in making travel decisions, the TPB from social psychology was used as a complementary theory to enrich this research. It was confirmed that three innovation characteristics (perceived relative advantages, compatibility, and complexity) were significant factors direct impacting attitudes towards travel app shopping.

Consistent with prior studies (Amaro & Duarte, 2015), attitudes, communicability, and perceived behavioral control were found to be important psychological factors in purchasing travel products and services through apps. Although this study revealed a lower behavioural intention result of R2 value (44 %) compared to previous studies (R2 = 60%) from Amaro and Duarte (2015) and Fusch et al. (2012), the findings are considered novel because the data collection period (post-pandemic phase) was conducted during the reopening of the tourism sector. Such a result can be explained by Kim et al.'s (2021) study that many individuals are still facing an increased risk of prolonged COVID-19 threats which might impact negatively on their behaviour, especially regarding the tourism sector.

In addition, this research enriches the travel app literature by confirming the mediating role of attitudes in the link between travel app perceptions and intentions to purchase. The causal link of perceptions-attitudes-intentions is parallel to the proposition documented in several behavioural theories, including TPB (Ajzen, 1991). Again, the current work provides a solid foundation for future research development with respect to the potential influence of attitudes in bridging the gap between perceptions of innovation and behavioural intentions.

Finally, novel evidence is provided on the effect of inertia in predicting in-app purchase intentions. The literature has consistently highlighted that inertia is a key barrier to implementing innovations (Gong *et al.*, 2020; Mikalef *et al.*, 2020) and has characterized inertia as a “devil” in the implementation of innovation while exploring the antecedents to mitigate inertia (Wang *et al.*, 2020). In contrast, the current findings suggest that inertia is not always a negative, as it can also act as a strategy to reinforce the effects of attitudes and perceived behavioural control on intentions. So, if travel apps are continually updated with improved versions and interesting features, high inertia users are more likely to buy travel products and services through the apps, reducing the intention to switch. This conclusion adds a perspective on how to effectively provide users with accumulative experiences that are pleasurable and facilitate positive intentions.

### ***6.3 Managerial Implications***

This research has several practical implications especially on developing and improving available travel apps. Both travel providers and destination marketing organization (DMO) (i.e., Ministry of Tourism) must continue to improve app design and functionality to stimulate user intentions to

purchase travel products and services within the app. First, users are more likely to have positive attitudes in using travel apps if they found the apps to have advantages and are compatible with their lifestyles and values, and are less complex. The roles of travel apps are to provide current and useful information, to solve problems and make reservations easier. Companies can make apps more advantageous by housing the entire booking process under one roof so that users can plan their holidays in one channel without having to use other platforms (CNBC, 2021). For example, users can book air tickets and accommodation, as well as exploring attractive sightseeing destinations. While the official travel app in Malaysia (i.e., Malaysia Trip Planner) is expected to integrate various information to help users discover what to see and where to go. The Ministry of Tourism can also encourage users to download and continue using the application by offering users a variety of unbeatable incentives, in which, the app can be used as a main platform to share special travel and accommodation offers and a raft of attractive packages offered by hotels, tour operators and online travel-related businesses.

To be compatible with users' needs and lifestyles, travel providers and DMOs should be alert to the latest developments in mobile technologies. Since travel planning can be exhausting and time-consuming, it is essential to make apps an ideal solution to provide flexible and simple-click experiences. For example, travel providers can incorporate customizable search features with a variety of filters to allow users to search according to personal preferences including budget ranges, reviews and ratings, types of accommodation, and available facilities. Moreover, since most people are looking forward to using innovative apps with high productivity, travel providers must consider optimizing documentation processes for all reservations made via apps. That is, instead of printing tickets, all reservations should be accessible and accepted for check-in by scanning softcopy documents or using QR codes. Travel apps, especially those introduced by DMOs can be used as a tool to reignite the tourism industry in a post-pandemic world, for example, it allows users to check the COVID-19 status of destinations before embarking (World Travel & Tourism Council, 2020), receive information on what tests, measures, and documents are needed before travel, as well as sharing them with real-time entry rules and the expected volumes of queues and crowds.

Communicability is another critical factor influencing purchase intentions. To ensure that apps reach large audiences, travel providers should consider collaborating with credible social media influencers and key opinion leaders in hospitality and tourism (Pop et al., 2021). Influencers with large numbers of followers on social media help companies to increase product awareness and

competitive advantage, which drive purchase intentions. Influencers as a promotional tool are more effective at engaging with users at a personal level, as they will genuinely explain the benefits of certain travel app, showing users how to use it, which ultimately influence their emotions and behaviors.

Furthermore, this research also highlighted that those experiences accumulated from the past help activate inertia mindsets, reducing the probability of considering other options when people are making travel purchases. Inertia can be a facilitator in encouraging the purchase of travel products and services from the same app. However, this is only found significant when users have formed favorable attitudes and abilities (i.e., perceived behavioural control) towards the use of a travel app. Those who have developed stronger perceptions tend to feel that exploring new travel apps will be unduly difficult and will take time, and this encourages them to place orders with the same app (discourages switching). Push notifications can be used as an approach to maintain user commitment. Well-designed, convincing, and personalized messages can make users feel extra special. Seasonal offers should also be provided to these users.

## **7. Conclusion and Future Research Directions**

With the omnipresent use of technology and the growth of smartphones, travel apps have become the preferred platform for travel companies to advertise products and share promotional offers. Grounded on two prominent theories (DOI and TPB), this research attempted to fill literature gaps by exploring the factors influencing attitudes towards travel app shopping and in-app purchase intentions. The mediating role of attitude and moderating role of inertia were examined to strengthen the effects on in-app purchase intentions. The results are expected to provide actionable insights to various stakeholders, especially travel companies to increase the functionality of travel apps, as a vital tool to revive the industry after the COVID-19 pandemic.

Like other studies, this research had several limitations. The current research only focused on one developing country -- Malaysia, and the sample was not representative of the greater global marketplace. Additional research that compares the use of travel apps across various countries (e.g., developing vs. developed or Western vs. Eastern) will be valuable. Additionally, with the increasing prevalence of travel apps as a distribution channel, longitudinal, or experimental research designs will be useful for better understanding of the causal relationships between the model elements and

in-app purchases. On the flip side, while the model proposed framework targeted existing users, some individuals abandon apps shortly after adopting them (Mondal & Chakrabarti, 2021). A recent Statista report (2019) showed that, on average, about 73% of users abandon apps within one month of downloading. This provides a research orientation for future studies in exploring how to make travel apps more compelling, while the findings will contribute enormously to academics and practitioners regarding the anatomy of app abandonment behavior. Finally, this study adopted a conventional variable of income level, which did not help to understand the available income and willingness to buy. Thus, it would be advisable in future research to adopt the subjective income scale like willingness to purchase at a premium price.

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