Travel app shopping on smartphones: Understanding the success factors influencing in-app travel purchase intentions

Abstract

Purpose - 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 (IAPI). 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 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 IAPI 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 DOI and 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 applications (hereafter apps) is growing at a fast rate, 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 a key to enhancing travel experiences. Despite about 90% of users preferring to research their vacations online (Travel Daily News, 2021), 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 in their

development (Linkedin, 2019). This happens since about 50% the users uninstall apps when systems are not performing well or not keeping 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 (Business Traveller, 2019). Also, the conversion rate of travel apps remains at a very low level of 0.7% which lags far behind other digital selling formats (Deane, 2021). This situation raises two crucial questions for scholars to investigate further: (i) What are the factors that motivate user attitudes towards app travel shopping and in-app purchase behaviour (IAPI)? and (ii) What are the boundary conditions that significantly enhance IAPI?

Related research in this domain focuses on narrower themes such as satisfaction, intention to adopt, and user engagement, yet minimal attention has been given to purchase intentions when using travel apps. This was highlighted in Coves-Martínez *et al*.'s (2021) study, which stated adequate 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. There is also a need to determine how the adoption of travel apps affects marketing results (i.e., intentions to purchase from the platform) (Chen *et al*., 2021). Although both usage and purchase intentions reflect user behaviour, they are different in terms of definitions and applications. Usage behavior generally refers to readiness and willingness to adopt or use a technology system; purchase intentions, by contrast, refer to the possibility of making a decision to purchase an item (Vahdat *et al*., 2021). It has been recommended that it is important to further investigate user purchase intentions, as buying on platforms is the primary initiator that helps service providers maintain systems and derive monetary benefits (Jang *et al*., 2018). Despite various suggestions to look further into this perspective, thus far, empirical work that has focused on the factors that drive IAPI of travel apps remains scant.

Based on data collected from travel app users in an emerging country, i.e. Malaysia, this study is expected to offer several insightful results to the field of research. First, an integrated framework is proposed 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 IAPI. The proposed model extracts 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). In doing so, this study offers travel

providers a salient understanding of user behavior and perceptions that are essential for successful implementation of travel app strategies and converting potential into actual customers.

Second, this study offers an original contribution by exploring inertia as a contingency factor that impacts IAPI. Several studies have found that inertia is a consumption trait that significantly influences purchasing and switching behaviour (Cao *et al*., 2020). This is a concern for travel apps that still in the embryonic stage when compared to travel trade intermediaries and websites (Mu *et al*., 2021). Although apps offer numerous benefits to users, including the richness of information; 24/7 availability; and cost savings (Amaro and Duarte, 2015; Buhalis, 2003), it seems that the number of "lookers" does not translate into an adequate number of "bookers" (Morrison *et al*., 2001). In IS literature, inertia is also seen as the reason for consumer resistance to the use of a new application. (Gong *et al*., 2020). However, there have been limited studies examining the moderating effects of inertia on the formation of purchase intentions concerning TPB constructs. By taking a step forward in investigating the moderating effects of inertia, the outcomes are expected to offer travel providers a better understanding and guidance on how to implement marketing tactics that can constantly arouse user interest in purchasing from travel apps.

2. Theoretical Foundations

A myriad of theoretical models are available to study mobile app adoption. For example, McLean's (2018) work adopted the TAM model to understand the effects of perceived usefulness and perceived ease of use on mobile app engagement. Arfi *et al*. (2021) enriched the app research by using UTAUT model; and Chopdar *et al*. (2022) examined app users' behaviour from the lens of S-O-R model. Compared to those models of technological adoption, the DOI seems to offer a better understanding and greater explanatory power to predict user adoption processes and decisions (Min *et al*., 2019; Lee *et al*., 2011), since it incorporates explanations from social and psychological perspectives. The TPB (Ajzen, 1991) is another most pioneering and parsimonious models when it comes to understanding user purchase decisions that are influenced by a series of psychological factors including traveler motivations, beliefs, social status, perceptions, and emotions (Ajzen, 1991; Ulker-Demirel and Ciftci, 2020).

2.1 Diffusion of Innovation Theory (DOI)

The DOI theory introduced by Rogers (2003) is used to describe the beliefs, structures, and processes when people adopt innovations. Five features of innovations i.e., relative advantage, compatibility, observability, complexity and trialability, are suggested to encourage users to overcome uncertainty when adopting new technology (Rogers, 2003). Several studies have applied DOI to explore user behaviour in adopting cutting-edge technologies, including Min *et al*. (2019) investigated the factors influencing user adoption of Uber mobile apps; and Hong *et al*. (2017) explored the reasons driving smartwatches continue usage. 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 and Morris, 1996). 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 and travel agent systems (Wang *et al*., 2018). Thus, these three features deserve further study, particularly on how user perceptions of travel apps are influenced.

2.2 Theory of Planned Behaviour (TPB)

The 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 (Ajzen, 1991). Attitudes are the positive (negative) assessment of a person's self-performance for a particular behaviour. Subjective norms are perceptions people have of the normative social pressures to perform a certain behaviour. Perceived behavioral control (PBC) involves beliefs about the presence of factors that facilitate (or impede) behavioral performance. Empirically, this theory has been broadly used by researchers in predicting the behaviour of tourists, such as choice of destinations, accommodation decisions and transport selection (Liu *et al*., 2021; Wang and Wong, 2020). In this study, it is thus appropriate to use TPB to further understand how attitudinal judgements towards travel apps are associated with intentions to purchase.

3. Hypotheses Development

3.1 Drivers of Attitude

Perceived Relative Advantages (PRAs)

PRAs reflect the degree to which an innovation is perceived to be better than a predecessor. In IS studies, this factor is articulated as motives to stimulate positive perceptions towards an innovation (Jiang *et al.*, 2021). In this case, the relative advantages 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 (Ali *et al*., 2021). It has also 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 (Vahdat *et al*., 2021). Consequently, Amaro and Duarte (2015) defined PRAs as a multidimensional construct consisting of five aspects: time-saving, financial advantages, convenience, product variety, and enjoyment. It is believed that this concept is theoretically significant and parsimonious, as well as being a representation of the benefit dimensions. Thus, it is suggested that when users perceive they can gain more advantages from purchasing using travel apps than through other platforms, the apps are more likely to influence user attitudes towards app-travel shopping. This was proposed in the following hypothesis:

H_{1a}: PRAs positively influence attitudes towards app-travel shopping.

Perceived Compatibility

Perceived compatibility refers to "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). Compared to traditional booking platforms, travel apps are multi-attribute platforms that save consumers time in searching and managing travel (Choi *et al*., 2019). As a result, users are more likely to form positive attitudes when they perceive using travel apps to be compatible with their ways of life, therefore, the following was hypothesized:

H_{1b}: Perceived compatibility positively influences attitudes towards app-travel shopping.

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, 2003). 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. 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_{1c}: Perceived complexity negatively influences attitudes towards app-travel shopping.

3.2 Drivers of in-app purchase intentions

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 IAPI:

H_2: Attitudes positively influence IAPI.

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. Tourism literature also indicate that 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 and attractive (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, requiring high involvement, and being difficult to differentiate (Buhalis and Sinarta, 2019; Öz, 2015). These findings lend credence to the notion that communicability is a key element influencing IAPI and thus:

H_3: Communicability positively influences IAPI.

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). Ajzen (1991) proposed that PBC has two components: 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 and Fygenson, 2006; Vijayasarathy, 2004).

As the functions of technological tools become less complex, effortless, and more familiar, users perceive increasing self-efficacy and controllability. Amaro and Duarte (2015) found those individuals who acquired sufficient technology capabilities had greater intentions to make online travel purchases. Kim *et al*. (2021) determined that PBC 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 IAPI. 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 *et al*., 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 how positive (i.e., PRAs 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., PRAs, compatibility, and complexity) impact IAPI. The following hypotheses were proposed:

H_{5a}: Attitudes mediate the relationship between PRAs and IAPI.

H_{5b}: Attitudes mediate the relationship between perceived compatibility and IAPI.

H_{5c}: Attitudes mediate the relationship between perceived complexity and IAPI.

3.4 Moderating Effect of Inertia

There is mounting evidence indicating that inertia acts as a psychological switching barrier 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 mobile users 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 tasks, thus developing an emotional attachment to the current service.

This research expected inertia to play a moderator role in the formation of in-app purchasing intentions, supported by the following justifications. First, although there are meagre findings specifically examining the moderating impact of inertia with TPB constructs, there is considerable research indicating that inertia is a unique condition 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). Second, the literature points out that inertia is a significant anchor that influences user behaviour when faced with new information technology. It was found that users often stick with status quo choices (i.e., inertia) rather than making new choices when assessing particular technologies (Polites and Karahanna, 2013). Murray and Häubl (2007) determined 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 switching rates.

Although studies have drawn attention to how consumption traits can be moderators, how inertia moderates IAPI still requires deeper examination. Based on this empirical evidence, 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 websites, travel agencies, etc.). Hence, they might feel more comfortable using an existing app to search for and purchase travel products. Therefore, the following sub-hypotheses were developed:

H_{6a}: The relationship between attitudes and IAPI becomes stronger when inertia is high.

H_{6b}: The relationship between communicability and IAPI becomes stronger when inertia is high.

H_{6c}: The relationship between PBC and IAPI becomes stronger when inertia is high.

Since prior research in the tourism field has also indicated significant differences for gender, age, education, and purpose of travel (Martin *et al.*, 2020), thus this study included these as control variables to avoid any spurious effects on the outcomes (i.e., IAPI). 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 created to collect the data. 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, will 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 that are often used by the population in Malaysia, including Facebook Messenger, WhatsApp, Instagram, and Linkedin (Statista, 2021a). Disseminating the survey using this method was found most effective when the data collection period was impacted by COVID-19 lockdowns, where outdoor activities were reduced and social distancing was maintained to prevent the spread of the virus (Zheng *et al*., 2021).

From July to October 2021, 535 responses were collected, but 35 straight-lining responses were discarded. 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[1]. 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 (see Table 2). Attitudes were measured using Ajzen's (1991) scale. PRAs was adapted from Amaro and Duarte (2015). The scale of PBC was proposed by Pavlou and Fygenson (2006). Scale from Morrison et al. (2001) was used to measure communicability and perceived complexity. The scale of the perceived compatibility construct was modified from Vijayasarathy (2004). IAPI were based on Bigné *et al*.'s (2010) and Limayem *et al*.'s (2000) studies, while inertia is adapted from Han *et al*. (2018). Two preliminary tests were conducted to validate the measurement. First, for a pre-test a panel of ten respondents 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, with some items underwent minor changes in terms of wording.

4.3 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*., 2021). With the SmartPLS software, the assessment process was divided into two phases: the measurement and structural models (Hair *et al*., 2019).

[1] A monthly income of US$500 to US$750 is known to be an average salary in Malaysia, which is a standard income for many junior and some senior executives (Statista, 2021b)

5. Results

5.1 Common Method Bias (CMB)

CMB was addressed through both *a priori* and *post hoc* measures (Podsakoff *et al.*, 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. The *post-hoc* measure using Harman single-factor analysis found a single factor accounted for only 30.03% of the total variance (<50% criteria) (Podsakoff et al., 2012). The full collinearity test showed that the 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.

5.2 Measurement model

All the constructs achieved satisfactory reliability, as the values of CR exceeded the threshold values of 0.70 (Hair *et al.*, 2019). The convergent validity requirements were also met, where the AVE < 0.50 and loading <0.708 (Hair *et al.*, 2019). Next, the HTMT score for each latent construct <0.85, indicating acceptable discriminant validity (Table 3) (Hair *et al.*, 2019).

[Insert Table 2 and 3 here]

5.3 Higher-Order Construct (HOC)

A disjoin two-stage approach was undertaken to assessed two HOC, i.e., (i) PBC with two sub-dimensions: self-efficacy and controllability; and (ii) PRAs 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 PRAs ($\beta = 0.872$) 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 (Sarstedt *et al.*, 2019). Multicollinearity was not a concern as the VIF values were less than 3.33 (Hair *et al.*, 2019) (Table 4).

[Insert Table 4 here]

5.4 Hypotheses Testing

Bootstrapping with 5,000 sub-samples was used to assess the proposed hypotheses. Specifically, PRAs ($\beta = 0.344$, $t = 7.078$) and perceived compatibility ($\beta = 0.357$, $t = 6.660$) showed a positive

relationship with attitudes, while a negative relationship was found for perceived complexity (β = -0.119, *t* = 3.461) (see Table 5). Additionally, attitudes (β = 0.439, *t* = 7.258), communicability (β = 0.144, *t* = 2.994), and PBC (β = 0.166, *t* = 3.418) were significantly associated with IAPI. Insignificant results were found for all four control variables (p > 0.05). For the mediation analysis, attitudes were found significantly connect between PRAs (β = 0.151, *t* = 4.639), compatibility (β = 0.156, *t* = 5.239) and complexity (β = -0.052, *t* = 3.056) on IAPI.

Both the ATT x Inertia (β = 0.114, *t* = 2.034) and PBC x Inertia (β = 0.101, *t* = 1.741) interactions were found to be significant influences on IAPI (Table 5). From the interaction plots, it can be seen that the effect of attitudes and PBC on IAPI were stronger among users with higher levels of inertia (see Figure 2). However, the results showed non-significance on the interaction between communicability x Inertia on IAPI. 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., PRAs, compatibility and complexity. The three main constructs of TPB, i.e., attitudes, communicability, and PBC as well as four control variables accounted for 44% of the variance in IAPI. Last, the Q^2 for all the endogenous constructs >0 indicating predictive relevance in explaining the endogenous constructs (i.e., attitudes = 0.341; IAPI = 0.346) (Hair *et al.*, 2019).

[Insert Table 5 here]
[Insert Figure 2 here]

6. Discussion and Implications

6.1 Main findings

Building on the frameworks of DOI (Rogers, 2003) and TPB (Ajzen, 1991), this research explored the determinants of attitudes towards travel app shopping and IAPI. The results indicated three innovation variables (PRAs, compatibility, and complexity) had positive effects on attitudes (H1a, H1b, and H1c were supported). The PRAs of travel apps were deemed useful when they provided people with product variety, enjoyment, convenience, time-savings, and financial benefits (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 (Jiang *et al.*, 2021). Perceived compatibility was

the most important factor in affecting attitudes. This suggests that most respondents perceived using travel apps 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, 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 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 them; whereas if functions are considered complicated, they will quit after using for some time. This finding corresponds with Huang and Mou (2021), who found that selling technologies which are simpler are more likely to engage users.

As suggested by the TPB, attitudes, communicability, and PBC were positive predictors of IAPI (H2, H3, and H4 were supported). When users have more positive attitudes about travel app shopping, they are more likely to soon book travel products and services through apps. This is in accordance with Bigné *et al*. (2010), who demonstrated that attitudes were the strongest predictors of purchase intentions. The significant relationship between communicability and IAPI also confirms previous research that this is an 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. 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 connections) and internal (i.e., technological competence and ability) resources are more motivated to purchase travel products and services through apps. Although this study revealed a lower IAPI result of R^2 value (44 %) compared to previous studies (R^2 = 60%) from Amaro and Duarte (2015) and Fuchs *et al*. (2012), the findings are considered novel because the data collection was conducted during the reopening of the tourism sector (post-pandemic phase). This is in parallel with 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.

Attitudes towards travel app shopping are significant in connecting the relationship between PRAs, complexity, and compatibility for IAPI (H5a, H5b, and H5c were supported). This is in parallel with studies using 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 towards travel app shopping, their perceptions of PRAs, 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 IAPI. 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. They 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 IAPI 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

This research incorporated interdisciplinary concepts into a unified model to shed further light on two research questions (i.e., factors driving attitudes towards app shopping and IAPI). It is argued that it is necessary to address key user concerns when adopting travel apps, 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 was used as a complementary theory to enrich this research. It was confirmed that three innovation characteristics (PRAs, compatibility, and complexity) are significant factors directly impacting attitudes towards travel app shopping. Consistent with the TPB model, attitudes, communicability, and PBC were found to be important psychological factors in purchasing travel through apps.

In addition, this research enriches the travel app literature by confirming the mediating role of attitudes in bridging the gap between perceptions of innovation and behavioural intentions. The causal link of perceptions-attitudes-intentions is parallel to the proposition documented in several behavioural theories, including TPB (Ajzen, 1991). Finally, novel evidence is provided on the effect of inertia in predicting IAPI. Although most literature has consistently highlighted inertia as a "devil" in the implementation of innovation while exploring the antecedents to mitigate inertia (Wang *et al*., 2020), in contrast, our findings suggest that inertia is not always a negative, as it can also act as a strategy to reinforce the effects of attitudes and PBC 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 the destination marketing organizations (DMOs) (i.e., Ministry of Tourism) must continue to improve app design and functionality to stimulate user intentions to purchase travel products within apps. First, users are more favorable towards travel apps that have advantages, compatible with their lifestyles and values, and are less complex. 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). The official travel app developed by the Ministry of Tourism is expected to integrate various information to help users discover what to see and where to go. In fact, the Ministry of Tourism can encourage users to download and continue using the app by offering them a variety of unique incentives, in which, the app can be used as a main platform to share multiple attractive packages offered by hotels, tour operators and online travel-related businesses.

To be compatible with user 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 that provide flexible and simple-click experiences. For example, travel providers should incorporate customizable search features with a variety of filters to allow users to search according to personal preferences including budget ranges,

reviews and ratings, 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, by allowing users to check the COVID-19 status of destinations before embarking (World Travel and Tourism Council, 2020), receive information on what tests, measures, and documents are needed before travel, as well as sharing 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., PBC) 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

Grounded on two prominent theories (DOI and TPB), this research filled literature gaps by exploring the factors influencing attitudes towards travel app shopping and IAPI. The mediating role of attitude and moderating role of inertia were examined to strengthen the effects on IAPI. 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 is 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 and Chakrabarti, 2021). A recent Linkedin (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 in understanding the available income and willingness to buy. Thus, it would be advisable in future research to adopt a subjective income scale like willingness to purchase at a premium price.

References

Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.

Amaro, S. and Duarte, P. (2015), "An integrative model of consumers' intentions to purchase travel online", *Tourism Management*, Vol. 46, pp. 64-79.

Arfi, W. B., Nasr, I. B., Khvatova, T. and Zaied, Y. B. (2021), "Understanding acceptance of eHealthcare by IoT natives and IoT immigrants: An integrated model of UTAUT, perceived risk, and financial cost", *Technological Forecasting and Social Change*, Vol.163, 120437.

Bianchi, C. (2021), "Antecedents of tourists' solo travel intentions", *Tourism Review*, forthcoming.

Bigné, E., Hernández, B., Ruiz, C. and Andreu, L. (2010), "How motivation, opportunity and ability can drive online airline ticket purchases", *Journal of Air Transport Management*, Vol. 16 No. 6, pp. 346-349.

Buhalis, D. (2003), "eTourism: Information technology for strategic tourism management", Pearson education.

Buhalis, D. (2020), "Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: a perspective article", *Tourism Review*, Vol. 75 No. 1, pp. 267-272.

Buhalis, D. and Sinarta, Y. (2019), "Real-time co-creation and nowness service: lessons from tourism and hospitality", *Journal of Travel & Tourism Marketing*, Vol. 36 No. 5, pp. 563-582.

Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S. and Hofacker, C. (2019), "Technological disruptions in Services: lessons from Tourism and Hospitality, *Journal of Service Management*, Vol. 30 No. 4, pp. 484-506.

Business Traveller. (2019), "Travel apps not living up to potential, report says", available at: https://www.businesstraveller.com/business-travel/2019/04/03/travel-apps-not-living-up-to-potential-report-says/ (accessed 24 July 2021).

Cao, X., Yao, J. and Chen, X. (2020), "Exploring bloggers' switching toward microblogging", *Internet Research*, Vol. 30 No. 6, pp. 1811-1833.

Carter, S. and Yeo, A. C. M. (2016), "Mobile apps usage by Malaysian business undergraduates and postgraduates: implications for consumer behaviour theory and marketing practice", *Internet Research*, Vol. 26 No. 3, pp. 1066-2243.

Chen, L., Rashidin, M. S., Song, F., Wang, Y., Javed, S. and Wang, J. (2021), "Determinants of Consumer's Purchase Intention on Fresh E-Commerce Platform: Perspective of UTAUT Model", *SAGE Open*, Vol. 11 No. 2, 21582440211027875.

Choi, K., Wang, Y. and Sparks, B. (2019), "Travel app users' continued use intentions: it's a matter of value and trust", *Journal of Travel & Tourism Marketing*, Vol. 36 No. 1, pp. 131-143.

Chopdar, P. K., Paul, J., Korfiatis, N. and Lytras, M. D. (2022), "Examining the role of consumer impulsiveness in multiple app usage behavior among mobile shoppers", *Journal of Business Research*, Vol. 140, pp. 657-669.

CNBC. (2021), "Vaccination is key to bringing tourism back from the brink, industry leaders say", available at: https://www.cnbc.com/2021/06/17/tripcom-airasia-and-oyo-on-global-travel-recovery-from-covid-vaccines.html (accessed 26 September 2021).

Coves-Martínez, Á. L., Sabiote-Ortiz, C. M. and Frías-Jamilena, D. M. (2021), "Cultural intelligence as an antecedent of satisfaction with the travel app and with the tourism experience", *Computers in Human Behavior*, Vol. 127, 107049.

Davies, J., Foxall, G. R. and Pallister, J. (2002), "Beyond the intention–behaviour mythology: an integrated model of recycling", *Marketing Theory*, Vol. 2 No. 1, pp. 29-113.

Deane. S. (2021), "Over 60 Online Travel Booking Statistics (2021)", available at: https://www.stratosjets.com/blog/online-travel-statistics/ (accessed 12 January 2022).

Dillon, A. and Morris, M. G. (1996), "User acceptance of information technology: Theories and models", *Annual Review of Information Science and Technology (ARIST)*, Vol. 31, pp. 3-32.

Essiz, O. and Mandrik, C. (2022), "Intergenerational influence on sustainable consumer attitudes and behaviors: Roles of family communication and peer influence in environmental consumer socialization", *Psychology & Marketing*, Vol. 39 No. 1, pp. 5-26.

Fink, A. (2017), *How to Conduct Surveys: A Step-by-Step Guide*, Sage, Thousand Oaks, CA.

Fuchs, M., Höpken, W. and Rasinger, J. (2012), "Behavioral intention to use mobile information services in tourism: The case of the tourist guide Dolomitisuperski. Mobi", *Information Technology & Tourism*, Vol. 13 No. 4, pp. 285-307.

Gong, X., Zhang, K. Z., Chen, C., Cheung, C. M. and Lee, M. K. (2020), "Transition from web to mobile payment services: The triple effects of status quo inertia", *International Journal of Information Management*, Vol. 50, pp. 310-324.

Hair, J. F., Risher, J. J., Sarstedt, M. and Ringle, C.M. (2019), "When to use and how to report the results of PLS-SEM", *European Business Review*, Vol. 31 No. 1, pp. 2-24.

Han, H., Kim, W., Lee, S. and Song, H. (2018), "Key determinants of upscale restaurant patrons' repeat purchase behavior: Testing the impact of inertia", *Journal of Quality Assurance in Hospitality & Tourism*, Vol. 19 No. 1, pp. 66-82.

Hong, J. C., Lin, P. H. and Hsieh, P. C. (2017), "The effect of consumer innovativeness on perceived value and continuance intention to use smartwatch", *Computers in Human Behavior*, Vol. 67, pp. 264-272.

Hsu, C. L. and Lin, J. C. C. (2016), "An empirical examination of consumer adoption of Internet of Things services: Network externalities and concern for information privacy perspectives", *Computers in Human Behavior*, Vol. 62, pp. 516-527.

Huang, Z. and Mou, J. (2021), "Gender differences in user perception of usability and performance of online travel agency websites", *Technology in Society*, Vol. 66, 101671.

Jang, S., Kitchen, P. J. and Kim, J. (2018), "The effects of gamified customer benefits and characteristics on behavioral engagement and purchase: Evidence from mobile exercise application uses", *Journal of Business Research*, Vol. 92, pp. 250-259.

Jiang, Y., Wang, X. and Yuen, K. F. (2021), "Augmented reality shopping application usage: The influence of attitude, value, and characteristics of innovation", *Journal of Retailing and Consumer Services*, Vol. 63, 102720.

Kim, B. and Kang, M. (2016), "How user loyalty and nonconscious inertia influence the continued use of mobile communications platforms", *International Journal of Mobile Communications*, Vol. 14 No. 4, pp. 387-410.

Kim, E. J., Tanford, S. and Book, L. A. (2021), "The effect of priming and customer reviews on sustainable travel behaviors", *Journal of Travel Research*, Vol. 60 No. 1, pp. 86-101.

Kock, N. and Lynn, G. (2012), "Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations", *Journal of the Association for Information Systems*, Vol. 13 No. 7, pp. 546-580.

Lee, Y. H., Hsieh, Y. C. and Hsu, C. N. (2011), "Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems", *Journal of Educational Technology & Society*, Vol. 14 No. 4, pp. 124-137.

Limayem, M., Khalifa, M. and Frini, A. (2000), "What makes consumers buy from internet? A longitudinal study of online shopping", *IEEE transactions on systems, man, and cybernetics-Part A: Systems and Humans*, Vol. 30 No. 4, pp. 421-432.

Linkedin. (2019), "Why Travel Apps Are Letting Tourists Down and What Destinations Can Do to Reverse This Trend", available at: https://www.linkedin.com/pulse/why-travel-apps-letting-tourists-down-what-can-do-reverse-uri-keren/ (accessed 20 August 2021).

Liu, Y., Shi, H., Li, Y. and Amin, A. (2021), "Factors influencing Chinese residents' post-pandemic outbound travel intentions: an extended theory of planned behavior model based on the perception of COVID-19", *Tourism Review*, Vol. 76 No. 4, pp. 871-891.

Martin, B. A., Jin, H. S., Wang, D., Nguyen, H., Zhan, K. and Wang, Y. X. (2020), "The influence of consumer anthropomorphism on attitudes towards artificial intelligence trip advisors", *Journal of Hospitality and Tourism Management*, Vol. 44, pp. 108-111.

McLean, G. (2018), "Examining the determinants and outcomes of mobile app engagement-A longitudinal perspective", *Computers in Human Behavior*, Vol. 84, pp. 392-403.

Min, S., So, K. K. F. and 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*, Vol. 36 No. 7, pp. 770-783.

Mondal, J. and Chakrabarti, S. (2021), "The abandonment behaviour of the branded app consumer: A study using interpretive structural modelling approach", *Journal of Retailing and Consumer Services*, Vol. 63, 102695.

Morrison, A. M., Jing, S., O'Leary, J. T. and Cai, L. A. (2001), "Predicting usage of the internet for travel bookings: An exploratory study", *Information Technology & Tourism*, Vol. 4, pp. 15-30.

Mu, Y., Bossink, B., Vinig, T. and You, S. (2021), "Managing service innovations at online travel agencies: evidence from China", *Journal of Hospitality and Tourism Technology*, Vol. 12 No. 3, pp. 533-547.

Murray, K. B. and Häubl, G. (2007), "Explaining cognitive lock-in: The role of skill-based habits of use in consumer choice", *Journal of Consumer Research*, Vol. 34 No. 1, pp. 77-88.

Nimri, R., Patiar, A. and Jin, X. (2020), "The determinants of consumers' intention of purchasing green hotel accommodation: Extending the theory of planned behaviour", *Journal of Hospitality and Tourism Management*, Vol. 45, pp. 535-543.

Öz, M. (2015), "Social media utilization of tourists for travel-related purposes", *International Journal of Contemporary Hospitality Management*, Vol. 27 No. 5, pp. 1003-1023.

Pavlou, P. A. and Fygenson, M. (2006), "Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior", *MIS Quarterly*, Vol. 30 No. 1, pp. 115-137.

Podsakoff, P. M., MacKenzie, S. B. and Podsakoff, N. P. (2012), "Sources of method bias in social science research and recommendations on how to control it", *Annual Review of Psychology*, Vol. 63, pp. 539-569.

Polites, G. L. and Karahanna, E. (2013), "The embeddedness of information systems habits in organizational and individual level routines: Development and disruption", *MIS Quarterly*, Vol. 37 No. 1, pp. 221-246.

Pop, R. A., Săplăcan, Z., Dabija, D. C. and Alt, M. A. (2021), "The impact of social media influencers on travel decisions: The role of trust in consumer decision journey", *Current Issues in Tourism*, pp. 1-21.

Reynolds, N. and Ruiz de Maya, S. (2013), "The impact of complexity and perceived difficulty on consumer revisit intentions", *Journal of Marketing Management*, Vol. 29 No. 5-6, pp. 625-645.

Rogers, E. M. (2003), *Diffusion of innovations (5th ed.)*, New York, NY: Free Press.

Ruiz-Mafe, C., Sanz-Blas, S., Hernandez-Ortega, B. and Brethouwer, M. (2013), "Key drivers of consumer purchase of airline tickets: A cross-cultural analysis", *Journal of Air Transport Management*, Vol. 27, pp. 11-14.

Sarstedt, M., Hair Jr, J. F., Cheah, J. H., Becker, J. M. and Ringle, C. M. (2019), "How to specify, estimate, and validate higher-order constructs in PLS-SEM", *Australasian Marketing Journal (AMJ)*, Vol. 27 No.3, pp. 197-211.

Statista. (2021a), "Active social media users as percentage of the total population in Malaysia from 2016 to 2021", available at: https://www.statista.com/statistics/883712/malaysia-social-media-penetration (accessed 20 September 2021).

Statista. (2021b), "Average monthly salary of employees in Malaysia from 2010 to 2020", available at: https://www.statista.com/statistics/712473/malaysia-average-monthly-salary/ (accessed 18 February 2022).

Travel Daily News. (2021), "Most popular mobile apps for travel", available at: https://www.traveldailynews.com/post/most-popular-mobile-apps-for-travelers (accessed 23 July 2021).

Ulker-Demirel, E. and Ciftci, G. (2020), "A systematic literature review of the theory of planned behavior in tourism, leisure and hospitality management research", *Journal of Hospitality and Tourism Management*, Vol. 43, pp. 209-219.

Vahdat, A., Alizadeh, A., Quach, S. and Hamelin, N. (2021), "Would you like to shop via mobile app technology? The technology acceptance model, social factors and purchase intention", *Australasian Marketing Journal*, Vol. 29 No. 2, pp. 187-197.

Venkatesh, V. and Davis, F.D. (2000), "A theoretical extension of the technology acceptance model: Four longitudinal field studies", *Management science*, Vol. 46 No. 2, pp. 186-204.

Vijayasarathy, L. R. (2004), "Predicting consumer intentions to use on-line shopping: The case for an augmented technology acceptance model", *Information & Management*, Vol. 41 No. 6, pp. 747-762.

Wang, J., Zheng, B., Liu, H. and Yu, L. (2020), "A two-factor theoretical model of social media discontinuance: role of regret, inertia, and their antecedents", *Information Technology & People*, Vol. 34 No. 1, pp. 1-24.

Wang, L. and Wong, P. P. W. (2020), "Marketing of environmentally friendly hotels in China through religious segmentation: a theory of planned behaviour approach", *Tourism Review*, Vol. 76 No. 5, pp. 1164-1180.

Wang, W. T., Ou, W. M. and 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*, Vol. 44, pp. 178-193.

Wang, Y. Y., Lin, H. H., Wang, Y. S., Shih, Y. W. and Wang, S. T. (2018), "What drives users' intentions to purchase a GPS Navigation app: The moderating role of perceived availability of free substitutes", *Internet Research*, Vol. 28 No. 1, pp. 251-274.

World Travel and Tourism Council (2020), "The future of the travel agency business after COVID-19", Retrieved 26 February 2022 from https://worldtraveltourismcouncil.medium.com/the-future-of-the-travel-agency-business-after-covid-19-e1565a6c2d6b

Yang, H., Yu, J., Zo, H. and Choi, M. (2016), "User acceptance of wearable devices: An extended perspective of perceived value", *Telematics and Informatics*, Vol. 33 No. 2, pp. 256-269.

Zheng, D., Luo, Q. and Ritchie, B. W. (2021), "Afraid to travel after COVID-19? Self-protection, coping and resilience against pandemic 'travel fear'", *Tourism Management*, Vol. 83, 104261.