

An Integrated Model of the Adoption of Information Technology in Travel Service

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This study intends to combine three theories to understand the adoption consumer behaviour to use information technology in travel and tourism activities. That theory is TAM, TPB and DIT. The amount of research that integrates these three theories is relatively small. The Respondents were tourism website users that active using the website in the last 3 months. The samples to be taken in this study were 242 people. Result showed that social influences have positive effect on perceived usefulness and perceived ease of use. Personal innovativeness has positive effect on perceived ease of use and perceived usefulness. Furthermore, perceived usefulness has positive effect on trust and behavioural intention. Ease of use has a positive effect on perceived usefulness and trust has negative effect on perceived risk. Ease of use doesn't have effect on behavioural intention and perceived risk was also doesn't have effect on behavioural intention.

Key words: *Theory of Acceptance Model, Theory of Planned Behaviour, Diffusion of Innovation Theory.*

Introduction

The tourism industry can be interpreted as a set of business sectors that produce various types of products and services needed by those who travel includes accommodation for visitors, food and beverage service activities, passenger transportation, reservation activities, cultural and entertainment activities. The tourism industry itself is one of the important economic sectors in Indonesia. Then, the development of information technology and the Internet are increasingly inevitably making changes in consumer behaviour.

The survey conducted by Asosiasi Penyelenggara Jaringan Internet Indonesia (APJII) in 2016 revealed that more than half of Indonesia's is connected to the internet. Most of them use mobile devices and computers (50.7%). The most frequently visited commercial content is for online shopping (62%) and the most frequent online shopping is to buy tickets (25.7%). This shows that Indonesian consumers are starting to try the technology of booking travel tickets and tourism online. These phenomena make the tourism industry to be able to do marketing through digital marketing. Digital marketing is marketing that uses internet media that can be accessed anywhere and anytime. This provides great benefits for consumers who need information related to tourism activities. Marketing through sites should be utilised by the tourism industry to facilitate the needs of tourists. But the question is what factors encourage consumers to adopt new technologies, especially information technology. This needs to be understood by tourism industry players so that investment in information systems can be welcomed by potential users.

Based on this issue, in this study, we intend to combine three theories to understand the behaviour of consumer innovation adoption, especially related to the use of information technology in its tourist activities. Theory of Acceptance Model (TAM) introduced by Davis et al, (1989) has been used extensively to explain how adoption behaviour is influenced by two things, namely perceived usefulness and perceived ease of use. Another domain that is also widely used in explaining technology acceptance is Theory of Plan Behaviour (TPB) and Diffusion of Innovation Theory (IDT). But the number of researches that integrates the three is still small.

Two variables added in addition to the three theories are trust and risk. Trust is a very important factor in e-commerce activities (Agag and Al Masry, 2016). Trust is defined as a person's subjective trust that the online provider party will fulfil its transactional obligations, as obligations that are understood by customers (Kim et al, 2008). More than one research revealed that trust has become a very crucial factor in attracting customers (Beldad et al, 2010). This is because trust reduces the perceived risk perceived by customers (Filleri, 2015).

Literature Review

Theory Acceptance Model (Tam), Theory of Planned Behaviour (Tpb), And Diffusion of Innovation Theory (Dit)

TAM is a theory of adaptation of the TRA (Theory of Reasoned Action). The purpose of TAM is to provide an explanation that determines the acceptance of computers in general; able to explain user behaviour from a variety of computer-based technologies (Davis et al, 1989).

The TAM model consists of two constructions; perceived usefulness and ease of use (perceived ease of use). Perceived usefulness refers to the extent to which someone believes that using a particular system will improve their performance (Davis et al, 1989). Whereas perceived ease of use is the extent to which one believes that using a particular system will free from effort Davis et al, 1998 (qtd. in Kallanmarthodi and Vaithyanathan, 2012).

TPB is a theory that reveals that one's intentional behaviour will be influenced by the social environment. This is what distinguishes TPB from TAM, if TAM reveals that someone intends to use something due to the person's evaluation of new technology, then TPB is more due to the encouragement of others that influences perspective and decision making (Mathieson 1991). TPB is closely related to attitude, behavioural control and subjective norms. In this study, the subjective norm is the main focus in building a combination model. Subjective norms express that a person's behaviour is influenced by thoughts that are being applied in society and one tends to follow the mass thinking (Lee 2009). In fact, at this time, a consumer tends to make decisions because of the norms and thoughts originating from the crowd that are felt to be followed.

DIT explains that the innovation process can actually be planned while adopters of new technological innovations can be divided into five groups namely (1) Innovators (2) Early Adopters (3) Early Majority (4) Late Majority and (5) Laggards. Innovators are people who are willing and able to use new innovations while laggards are the most recent group of people adopting technological innovations and generally these innovations are in a period of decline or mature. Thus, the diffusion of innovation theory shows that in order for new technological innovations to be accepted by society it is closely related to the ability of the community itself to accept and use innovation (Robertson 1967). If this is the case, the model of TAM and TPB should be considering the person's ability to innovate themselves so that they are able to follow new forms of innovation in technology. So we include personal innovativeness into our models in this research.

Perceived Usefulness

According to Chitungo and Monongo (2013), perceived usefulness is the extent to which a person believes that using a particular system will improve his work performance. That is, potential adopters assess the consequences of behaviours that they advertise based on sustainable desires derived from innovation (Chau and Hu 2001). Research on information system adoption shows that if a system does not help people in doing their work, the possibility is not well received (Nysveen et al, 2005). Users are actually willing to use a technology system when they accept that the system is useful and will provide efficiencies to their work (Gu et al, 2009).

Perceived Ease of Use

Perceived ease of use is defined as the degree to which a person believes that using a particular system will make him free from physical and mental efforts (Chitungo and Munongo, 2013). The easier a person interacts with the system, the more likely he will feel that the system is useful (Kallanmarthodi and Vaithiyanathan, 2012). Perception of the ease of use of two different systems significantly shows results that are not much different between before direct use (and loaded on the same factor) and after direct use. However, after users have direct experience, the characteristics of the system become significant in determining perceptions of ease of use.

Subjective Norm

Subjective norms according to Ajzen (1991) refer to what an individual believes from the thoughts of a group of people who are important in their lives about something that the individual must do or not do. The perceived opinions of these important people help determine whether someone is really going to do the behaviour. Constructive norms are social pressures felt by someone to be involved or not involved in behaviour.

According to Ajzen and Fishbein (1980), subjective norms as normative beliefs about the suitability of innovation adoption. According to this perspective, someone might adopt innovation not because of its usefulness but because of perceived social pressure. This kind of pressure can be ascribed to individuals whose beliefs and opinions are important, including peers and people in social networks (Igarria et al, 1996; Talukder et al, 2013).

Social Influence

The subjective norm is related to social influence. In this study social influence is how far the group of people can change the behaviour of an individual, in this case all forms of influence generated by the behaviours in the surrounding community.

Social influence consists of three things: compliance (which is the individual appeared to agree with other opinion but actually keep their own opinion), identification (which is the individual influenced by other people who are highly respected) and internalisation (which is the individual who agrees with other people opinions both publicly and privately) and this as the critical element in decision making (Lu, 2014).

Trust

Gefen et al, (2003) defines trust as someone's expectation that other parties who interact with it will not take undue profits from dependence on them. Pavlou (qtd. in Suh and Han, 2002) states that trust is a belief that someone can rely on a promise made by another party.

McKnight et al. (qtd. in Masrek et al, 2012) argue that trust in technology is equally important in ensuring the successful implementation of services provided through the technology itself. In the online context, Chang et al. (qtd. in Wu et al, 2010) argue that trust and trust in technology are present in a virtual environment to provide sensations to online users to give opinions and judgments before decisions are made. Trust has been found as a determinant of perceived benefits, especially in the online environment, because part of the guarantee that consumers will obtain the usefulness of the web interface depends on the people behind the website (Gefen and Straub, 1997).

Personal Innovativeness

Personal Innovation is the willingness of someone to try new information technology (Lu, 2013). Some researchers believe that the greatest influence on one's interpretation of something comes from the individual person and personal characteristics are more stable and not too diverse compared to the characteristics of the innovation itself or situational factors of innovation. According to Agarwal and Prasad (1998), someone with a higher personal innovation is expected to be able to adopt an innovation earlier.

Intention to Use

Intention is assumed to capture motivational factors that influence behaviour. Intention indicates how hard people are willing to try and how much effort is put in place to do behaviour. As a general rule, the stronger the intention to engage in behaviour, the more likely it must be done. The intention of behaviour can be an expression of behaviour only if the intended behaviour is under the control of the will, if the person can decide on the willingness to do or not to do the behaviour. Although some behaviours may actually meet these requirements quite well, there are several non-motivational factors that can influence behavioural intentions such as the availability of needed opportunities and resources (time, money, skills, cooperation with others) (Ajzen, 1991).

Davis et al, (1989) define behavioural intention to use as a possibility that someone will adopt an application. In this case, the theory of TAM uses actual use to represent measurements in terms of time or frequency of use. Behaviour intention is influenced by one's attitude towards system usage (attitude toward using system) and perceived usefulness, where the relationship

between attitude toward behaviour and behaviour intention has an equal relationship. Someone will show a certain intention to behave, if they get a positive effect first.

Hypothesis Development

Subjective norms according to Ajzen (1991) refer to something that an individual believes to do or not do from the thoughts of a group of people who are important in the life of that individual. Social image is defined by Goffman (qtd. in Muñoz-Leiva et al., 2013) as a social value desired by someone created through interaction with others. Bao et al. (qtd. Muñoz-Leiva et al., 2013) state that social image is associated with factors such as respect, honour, status, reputation, credibility and competence.

Social influences derived from subjective norms and images can influence the perceived usefulness of an innovation. According to Lin (qtd. in Wu et al., 2011) people's trust, which is important for consumers, will influence the tendency of consumers to use tourist sites. Whereas, Wu et al. (2011) in his research on the intention to use Web 2.0 websites concluded that if people who are important to users consider it necessary using certain websites, users tend to find the system useful. According to Venkatesh and Davis (2000) the increase in power and influence resulting from high status will increase productivity. Venkatesh and Davis (2000) states that increasing one's strength and influence due to high status will provide a basis for increasing productivity. Based on the results of research conducted by Venkatesh and Davis (2000), image as one of the social influence processes constructs has a positive influence on perceived usefulness on 3 measurement points. The research conducted by Lu (2014) shows that social influence has a direct positive impact to perceived usefulness. Based on the explanation above, we proposed the following hypothesis:

H1: Social influence has a positive effect on perceived usefulness

Social influence may help shape individual's estimates of his or her belief and ability in to use a system related to new technology. In line with the social information processing theory and the psychological patterns of internalisation and identification. Internalisation is integrating information process from expert sources into self-cognitive beliefs (Lu et al., 2005). People will combine the information obtained from reliable sources, opinion leaders as well as influential supervisors and colleagues, with the beliefs he already has. Whereas identification is related to image and fulfillment or achievement of certain status in social systems (Moore and Benbasat, 1991). Someone will try to fulfill what is perceived to be done relate to information that comes from influential people with aim to be considered as part of these people. The social influence on the perceived ease of use of new technology usage for the potential adopter before experience of direct usage of that technology cannot be avoided (Lu et al., 2005). If people who are close or become role models use the new technology,

assuming that the technology is easy to use, then someone will also feel that the technology is easy to use and he will use the technology. This was supported by the results of study conducted by Lu et al., (2005). In other hand, research conducted by Lu (2014) shows that social influence does not have direct positive impact to perceived ease of use. Even though, its suggest us that social influence has connection with perceived ease of use. Based on the explanation above, we proposed the following hypothesis:

H2: Social influence has a positive effect on perceived ease of use

Personal Innovation is the willingness of someone to try new information technology (Lu, 2013). Some researchers believe that the greatest influence on one's interpretation of something comes from the individual person and personal characteristics are more stable and not too diverse in the nature of innovation itself or situational factors of innovation. According to Agarwal and Prasad (1998), someone with a higher personal innovative is expected to be able to adopt an innovation earlier. This is because the higher the attention towards the innovation. The greater attention to an innovation will lead to higher desire to learn it. Active thinking to accept and learn new things will help someone to learn new things and will make it easier for the person to use the new system. Previous researches showed that there is an effect ov personal innovativeness to perceived ease of use (Agarwal and Karahnna, 2000; Lu et al., 2005; Lu, 2014). Based on the explanation above, we proposed the following hypothesis:

H3: Personal innovativeness has a positive effect on perceived ease of use

Personal innovation is someone's willingness to try new information technology (Lu, 2014). Some researchers believe that the greatest influence on one's interpretation of something comes from the individual. Personal characteristics are more stable and not too diverse compared to the innovation characteristics or innovation situational factors. Personal innovativeness comes from IDT and is defined as one's willingness to try new information technology (Agarwal and Prasad ,1998). According to Agarwal and Prasad (1998), individual with a higher personal innovative is expected to be able to adopt an innovation earlier. Because of the high level of innovation, the easier for someone to accept something new, the greater the person's tolerance for new things and the more observant he is to see the benefits that exist in. Some studies have found that personal innovativeness affected perceived usefulness (Lu et al., 2005; Lin and Filieri, 2015). However, in a study conducted by Rouibah and Abbas (2012); and Lu (2014), personal innovativeness did not affect perceived usefulness. Based on the explanation above, we proposed the following hypothesis:

H4: Personal innovativeness has a positive effect on perceived usefulness.

McKnight et al. (qtd. in Masrek et al., 2012) argue that trust in technology is equally important in ensuring the successful implementation of services provided through the technology itself. In the online context, Chang et al. (qtd. in Wu et al., 2010) argue that technological trust has existed in a virtual environment to provide sensations to online users to give opinions and judgments before decisions are made. Trust has been found as a determinant of perceived benefits, especially in the online environment, because part of the guarantee that consumers will obtain the usefulness of the web interface depends on the people behind the website (Gefen, 1997). The meta-analysis about the trust relationship conducted by Kim and Peterson (2017) shows that perceived usefulness is an antecedent of trust. Based on this statement, we proposed the following hypothesis:

H5: Perceived usefulness has a positive effect on trust

Chitungo and Munongo (2013) stated that perceived usefulness had a strong positive effect on adopter intention to use innovation. Based on his research in Zimbabwe, it was found that perceived usefulness has a positive relationship in influencing respondents' intention to use an innovation. This result is consistent with the research result reconducted by Ayeh et al. (2013). Alharbi and Drew (2014) also show that perceived usefulness has effect on intention to use. In line with the results of the above research, the research conducted by Kim and Kang (2012) on 247 respondents in Korea showed that perceived usefulness is a significant factor that positively influences the intention to use mobile banking both in conducting account checks and account transfer transactions. In other hand, research conducted by Park et al., (2012) shows different result, this research shows that perceived usefulness did not have effect on behavioural intention. This gap needs further confirmation. Based on the explanation above, we proposed the following hypothesis:

H6: Perceived usefulness has a positive effect on the intention to use

Perceived ease of use has a direct influence on perceived usefulness. Therefore, the less effort is being made to use a system due to the ease of use of the system, the more often it uses the system to improve job performance (Venkatesh and Davis, 2000). Lin (qtd. in Wu et al., 2011) in his research found that the more benefits obtained from a system, the system will be considered more useful. Supporting the results of the above research, Wu et al., (2011) in his research found that perceived ease of use from users of Web 2.0 websites had a positive influence on their perceived usefulness for websites. Based on the explanation above, we proposed the following hypothesis:

H7: Perceived ease of use has a positive effect on perceived usefulness

Davis et al, (qtd. in Shanmugam et al., 2014) define behavioural intention to use as a possibility that someone will adopt an application. In this case, the theory of TAM uses actual measurements in terms of time or frequency of use. Venkatesh and Davis (2000) stated that there is a direct influence of perceived ease of use on the intention to use in several previous studies. Briefly TAM 2 states that perceived ease of use as one of the cognitive instrumental processes has an influence on the intention to use/usage intention. Based on the explanation above, we proposed the following hypothesis:

H8: Perceived ease of use has a positive effect on the intention to use

Online business is full of uncertainty because the parties involved in the transaction are not in the same place so that consumers cannot see things done or things offered by the seller directly. In addition, physical signs that can usually be used as a measure of one's seriousness in working with other parties, such as handshake or body language, are also not found. That is what causes trust is very important in the context of online business. Gefen et al. (2003) defines trust as expectation that other parties with whom one interact will not take inappropriate profits from dependence upon them. The greater the consumers' trust that the sellers will give what are promised, the less risk they will face. Strengthening trust is very important, where uncertainty will stick to risk. Risk is very likely to occur in online businesses. The proximity between risk and uncertainty is caused by contracts and guarantees on online businesses often lacking or lacking access to transaction authorisation (Muños Leiva et al, 2016). Based on this explanation, the hypothesis that is built is:

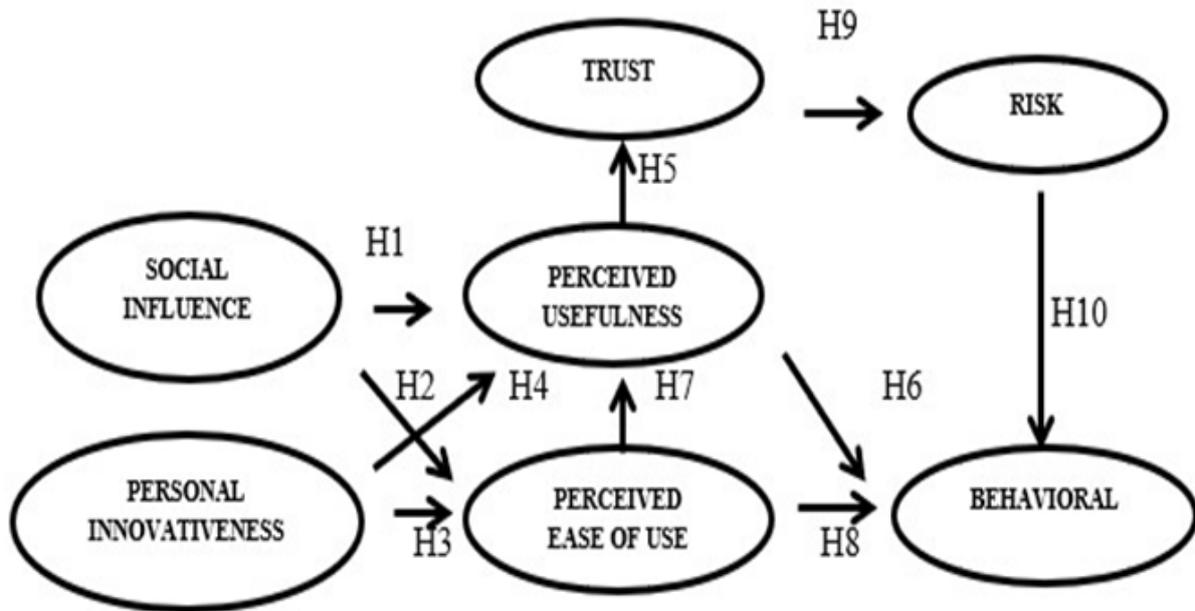
H9: Trust has a negative effect on the risk

Risk is an unwanted event that is part of life that can occur but cannot always be avoided. The more uncertain a situation is, the greater the risk of unwanted situation. In an online business that is full of uncertainty, risk is considered an important element that can reduce one's behavioural intentions, including the adoption of technology to conduct online business activities (Crespo and del Bosque, 2010; Herrero and San Martin, 2012). Considering conditions of online business, in this study, perceived risk is considered as an influential factor on the intention to use. The lower the risk that might occur, the greater the desire of consumers to use technology to shop online. In the context of online purchasing, research conducted by Pavlou (2003) shows that perceived risk has an effect on intention to transact online. The same result was found on research conducted by Wu and Ke (2015) that showed perceived risk also had an effect on intention to purchase. This kind of intention suggests that consumers also want to try online purchase technology. In other hand, research conducted by Muños-Leiva et al., (2016) showed different results; the perceived risk has no effect on the intention to purchase. Biucky et al., (2017) also found that perceived risk has no effect on intention to use. This gap needs more confirmation. Nevertheless, they still suggest that

perceived risk theoretically have relationships toward behavioural intention. Based on that, the proposed hypothesis is as follows:

H10: Risk has a negative effect on the intention to use

Figure 1. Research Model



Method

Sampling in this study using non-random sampling method with purposive sampling, sample selection for individual consumers who will be used as prospective respondents based on considerations or certain criteria based on research objectives (Sekaran, 2010). Prospective respondents in this study were tourism website users for their needs to plan their tourism activities using the website in the last 3 months. The samples to be taken in this study were 242 people.

Result and Discussion

Findings

The descriptive analysis shows that the respondent in this research consisted of men (38%) and women (62%). The most visited sites when ordering the trips and tourism are traveloka (74%). The most used tool to order is a smartphone (88%) and mostly access through smartphone apps (76%). The highest age range is between 18-21 years old (49%). The highest occupancy is students (51%), and the most need is to tour/travel with family (49%).

To test the effect between variables in this research model, we use the structural equation modelling with AMOS24 software, but first we measure the quality of the measurements used in this study. To assess the quality of measurement used in this research, confirmatory factor analysis (CFA) and reliability tests were conducted. Furthermore, the measurement model was examined using the criteria of overall fit. The results are that there are no invalid and unreliable measurement items

Table 1 reported the goodness-of-fit statistics of the model. All of them are within acceptable ranges (Bentler, 1990).

Table 1: Goodness-of-Fit summary for the measurement model

Model	Chi-Square	P	Cmin/df	CFI	TLI	RMSEA
Measurement	741.153	0.00	1.532	0.930	0.924	0.047

Table 2: Result for Path Coefficient & Hypotheses testing

Hypotheses	Estimate	S.E.	C.R.	Probability	Result
H1: PU <--- SI	0.231	0.045	5.147	***	Supported
H2: EoU <--- SI	0.132	0.036	3.709	***	Supported
H3: EoU <--- In	0.191	0.057	3.328	***	Supported
H4: PU <--- In	0.13	0.063	2.067	0.039	Supported
H5: Tru <--- PU	0.679	0.126	5.379	***	Supported
H6: BI <--- PU	0.587	0.116	5.075	***	Supported
H7: PU <--- EoU	0.67	0.13	5.163	***	Supported
H8: BI <--- EoU	0.202	0.128	1.58	0.114	Not Supported
H9: R <--- Tru	-0.436	0.121	-3.598	***	Supported
H10: BI <--- R	-0.064	0.038	-1.714	0.087	Not Supported

To test the hypotheses, the path coefficient and their significance value were used. Table 2. reported the result for path coefficient scores. Statistical results show that H1, H2, H3, H4, H5, H6, H7, H9 were supported because of the significance value < 0.05. However, H8 and H10 weren't support because of the significant value > 0,05.

Discussion

With the development of information technology, the consumer now shows the beginning of changes in thinking and behaving. With this change not only will someone want to adopt new things, and some even don't want to take part because of many things, especially matter relating to issues of trust and risk. The TAM theory argues that as long as new technology is felt easy to use and someone perceives that the new technology is useful, that person will be easier to join in adopting the new technology. On the other side, the TPB theory also argues

that someone will do his intention to use when influenced by social community. Associated with the theory of diffusion of innovation, people also have a level of self-innovation, higher the level of personal innovativeness, more likely he/she adopts new technology earlier than others. In fact the three theories intersect with each other so that the results of this study spawn a comprehensive model that summarises the three theories mentioned above.

The travel and tourism business are one of the strategic businesses, before innovation in the technology of booking travel and tourism services online, this business tended to be dominated by travel and tourism agents, and it was very difficult for someone to plan their travel and tourism. Even so, with this technological innovation, not meaning consumers will immediately use this technology, barriers such as ignorance of use, mistrust of data security is some form of factor that makes someone late to adopt new technology.

The results of this study indicate that social influence has an important role so that someone wants to join in adopting new technology, in this case the technology of online booking of travel services and tourism. When other people start using new technology, most likely someone will review and try out new technologies, and then start to build a perception about how easy new technology use and how useful that technology used for their needs. These results are in line with Lu et al, (2005) which shows that there is a positive effect between social influence on perceived ease of use and perceived usefulness of technology.

In addition, this perception of usefulness and ease of use is not solely due to external factors, but also because of the level of personal innovation inside a person. Someone who has a high level of self-innovation will often continue to update knowledge of new technology and be more open to new technology, so that the person will be more familiar and easier to assess the new technology whether the new technology is easy to use and whether the new technology useful for him. The results of this study indicate that the innovativeness of a person has a positive influence on the perception of ease of use and usefulness of travel and tourism services online booking technology. This result is also in line with Lu et al, (2005) which shows that there is a positive influence between personal innovativeness on perceived ease of use and perceived usefulness of technology.

The results of this study indicate that the perceived ease of use has no influence on the behavioural intention. This result is a contradiction with the findings of Rouibah and Abbas (2010) that state the perception of ease of use is a direct antecedent of behavioural intention. However, this perceived ease of use has a positive influence on perceived usefulness. This shows that the ease of use has an indirect effect on behavioural intention mediated by perceived usefulness of new technology. This means that a person will not intend to join in adopting travel and tourism online booking services technology as long as the technology is considered to have no use for him.

The results of this study also show a negative effect of trust on risk perceptions, meaning that when someone believes in new technology in travel and tourism online booking services, the perceived risk can be muted. Nevertheless, the perception of risk is found to have no effect on the behavioural intention. These results suggest that consumers will have a high intention to adopt new technology and ignore risks as long as the new technology is perceived as useful. This result is a contradiction with Muños-Leiva et al, (2016) which shows that risk perception has an influence on the intention to use technology. These results also show that consumers today seem to be inclined to take risks.

Conclusion

This research provides a good theoretical contribution to the development of theory because it successfully summarises three theories (TAM, TPB and TDI) into a comprehensive model that is able to explain how people intend to adopt new technology. This research also provides good managerial contributions. Managers must be able to highlight the factors of functionality, precision of function and reliability of new technology in travel and tourism online booking services so that they are quickly adopted by the public. In addition, the results of this study indicate that the level of self-innovation from consumers is also very important in improving the perception of the technology usefulness and ease of using new technology, giving suggestions that managers must pay attention, start communicating and provide education, how to use and benefit the community so that people do not become laggard.

The results of this study unsuccessfully show the influence of perceived risk on behavioural intention. Nevertheless, we argue that theoretically the perception of risk should have important role because digital services are still perceived to have a high enough risk, so for further research it is necessary to confirm whether the perceived risk has an effect or not on behavioural intention.

This study has several limitations. Although this study uses an online questionnaire, the disadvantage of spreading it online in the domestic environment is a low response rate and Indonesia is one kind of country that has a low response rate in terms of answering online questionnaires. For this reason, further research can be used with a larger sample size and can be tested with multi-cultural and multi-country respondents.

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