MJBE Malaysian Journal of Business and Economics

The Influence of Self-Service Technology on Consumers' Privacy and Security's Threats in The Airlines Industry

Nur Hikmah Masran[1] and Azaze-Azizi Abdul Adis[1*]

[1]Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia

*** Corresponding author's email:**
azizi@ums.edu.my

Received: 10 June 2019

Accepted: 30 June 2019

Keywords: *self-service technology, privacy concern, airlines industry, actual disclosure behaviour, Privacy Calculus theory, APCO Model*

ABSTRACT

A sophisticated world today is highly characterised based on technology-facilitated transactions that have changed ways the consumers interact with the employees and service providers. It has led to the transformation of service delivery from face-to-face to the use of self-service technology (SST). SST is becoming an important strategic asset for many hospitality organisations, in particular, the airline's industry. The use of SST in the airline's industry has gained enormous momentum in recent years through their company's website, mobile applications and airport kiosks, etc. However, as the adoption of technological advancement becomes worldly-wise and pervasive, concern on personal information are collected and shared widely with known and unknown entities that often without consumers' knowledge. These lead to a possibility of compromising the individual's personal information by third parties. Hence, the main aim of this study is to examine the overall overview of consumers' privacy and security's threat as a whole. The main objective is to examine the influence of SST on consumers' privacy and security's threat in the airline's industry. Therefore, based on previous studies, this paper will propose a new conceptual framework on the relationship of the influence of SSTs on consumers' privacy and will be using Privacy Calculus theory and APCO Model in determining the consumers' actual disclosure behaviour in the usage of SSTs. This paper provides consumers with a concise view and knowledge of the influence in using SST towards their privacy and threat's concern.

INTRODUCTION

Over the past decades ago, the advancements in information technology have changed the way consumers experience a service encounter and their relationship with service providers (Reinders, Dabholkar, & Frambach, 2008)traditional full service is increasingly replaced with technology-based self-service (TBSS. Consumers are no longer deal with them because of the adoption technology such as self-service that best at its convenience. The explosions of the Internet and other tools such as information system have made many companies incorporate technology into their operations and marketing. The impact has been keen in the service arena that has relied on close, personal contact between both consumers and employees traditionally. The technology is dramatically changing the way of services developed, conceived as well as delivered (Meuter, Bitner, Ostrom, & Brown, 2005). Technology, particularly information and communication technology (ICT), is becoming an important strategic asset for hospitality organisations in particular, airlines industry as it is needed in improving their organisational performance and strategic competitiveness (Cho & Olsen, 1998).

A sophisticated world today is highly characterised based on technology-facilitated transactions. There are increasing numbers of consumers that interact with technology in creating service outcomes instead of interacting with the employee of a service firm (Meuter, Ostrom, Roundtree, & Bitner, 2000). The method of service has migrated from traditional interaction of human to a new substitution of machines that involves service employees, or, where feasible in anywhere-anytime electronic service (Fitzsimmons, 2003). With regards to the technological advances development, rapid growth in information technology along with the emergence of new business models, it has led the fast transformation of service delivery from face-to-face to the use of self-service technology (SST) method by the companies in taking on new roles in the provision of products and services (Lu, Chou, & Ling, 2009; Ramaseshan, Kingshott, & Stein, 2015).

However, consumers' concern about privacy issues has arisen for many years back despite the benefits of technological advancement. The importance of privacy in today's globalisation world has been discussed widely and undisputed (H. Xu, Dinev, Smith, Hart, & Smith, 2008)the current understanding of privacy that emerges is fragmented and usually discipline-dependent. A systematic understanding of individuals' privacy concerns is of increasing importance as information technologies increasingly expand the ability for organizations to store, process, and exploit personal data. Drawing on information boundary theory, we developed an integrative model suggesting that privacy concerns form because of an individual's disposition to privacy or situational cues that enable one person to assess the consequences of information disclosure. Furthermore, a cognitive process, comprising perceived privacy risk, privacy control and privacy intrusion is proposed to shape an individual's privacy concerns toward a specific Web site's privacy practices. We empirically tested the research model through a survey (n=823. Recently, the explosive growth of information and communication technology (ICT) and the use of the Internet in obtaining information have fuelled debate towards the potential threats to privacy (Dinev & Hart, 2003). A borderless communication that connects people globally provides the needs for consumers to concern about their privacy issues Friedewald & Pohoryles (2013). According to De Cristofaro (2011)that is either motivated, or compelled, to share only the requested information. We define this problem as privacy-preserving sharing of sensitive information and are confronted with two main technical challenges: (1, technological advancement has amplified the issue of consumers' privacy risk. Data is exposed and could be retrieved and exchanged electronically and could be

collected by third parties such as companies. Privacy concerns are no longer held by consumers. Initially, consumers are exposed to privacy and security's threats in using SST in the airline's industry.

On the other hand, disclosure of information of the consumers becomes crucial in many aspects. Initially, technology has helped consumers dealing with their transactions without any human interaction (Mathew, 2008). Since it was a transformation from traditional services, a large number of airlines have introduced Self-service technologies (SST) and encouraged their passengers in using these technologies widely (Gures, Inan, & Arslan, 2018). However, some of the consumers are willing to disclose their information as they gain benefit from the use of SST in return as long as there would be an outcome of using the SST. It has become an integral part of the airport facility along with the introduction of new E-ticket as one of the examples, as it allows the internet's use for check-in method (Abdelaziz, Hegazy, & Elabbassy, 2010). Particularly, passengers can utilise the services by themselves without direct interaction with the employees (Beatson, Coote, & Rudd 2006; Elliott Hall & Meng 2012; Ku & Chen (2013); Tam & Lam,2004). Due to this, the consumers show the willingness to provide their sensitive data and personal information over the use of SST. Hence, there is a need to understand consumers' actual disclosure behaviour as many other consumers using the SST.

One of the factors that influence consumers' actual disclosure behaviour is the different personalities' traits of individuals. Personality traits are defined as an individual's dispositions or tendencies that lead to certain behavioural patterns across situations. Personality traits have been found to be relatively stable in individuals. In the early 1980s, a number of personality traits examined in the personality psychology field showed inconsistent results until the Big Five model was developed to consolidate important traits that were found to be reliable across domains. The Big Five model was a groundbreaking model in personality research that includes extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience which is intellect. The idea that personality traits might influence consumers' privacy has also been suggested by proponents of the consumers' privacy model (Osatuyi, 2015).

Nevertheless, SST is widely known as technological interfaces that enable consumers to gain benefits for themselves instead of dealing with organisations' personnel. Initially, SSTs is seen as perceived benefits and perceived usefulness (Meuter et al., 2000). Consumers do not just gain benefits through SSTs, it also gives consumer "usefulness" in which the use of SST is free of effort that indirectly improves consumers performance with these technological system based. Consumers are no longer deal with any human interaction and interestingly, the use of SST is known as a user-friendly. In addition, consumers obtain the benefits that are user-friendly and they viewed the classifications of convenience, person or object, and delivery for SST differently than traditional services (Cunningham, Young, & Gerlach, 2009). There are three types of SST which are self-service kiosk, internet-based self-service and mobile-commerce (Ong, 2010). Hence, self-service methods which are check-in via airlines website, mobile technology and airport kiosks are used in order to meet the growing demand for more self-service options (Strother, Fazal, & Rettich, 2010). Airline ticketing is one of the famous examples which the use of technology changed the consumers' interface to the point if replacing the traditional consumer interface completely. With the introduction of self-service technologies, it enables the airlines in reducing both time and number of staff required. Hence, it will save substantial costs in operations (Abdelaziz et al., 2010).

Despite SST benefits and advantages, the technological advancement in service delivery has brought to insecurity and threats among the consumers (Zeithaml & Gilly, 1987). Initially, it has significantly amplified the issue of privacy risk. The airline's industry, in particular, holds massive consumers' personal data and information (Zulhuda & Delpisheh, 2011). These consumers' personal data and information are needed for specific reservation through self-service technologies (SSTs) including their name, date of birth, home address and phone numbers (Asinari & Poullet, 2004). However, as data is routinely exchanged electronically, it would be easy for the third parties to manipulate and collect consumers' personal data (De Cristofaro, 2011). For instance, few airlines such as US Airways, United Airlines and American Airlines have experienced data breaches in which the third parties had accessed to breach consumers' personal data and information that led to a massive exposure leakage. All passports, e-mails and personal details were found misuse (Millet, 2015). Based on the discussion stated above, the main objective of this study is to examine the influence of the usage of Self-service Technology (SST) towards the privacy concern among the consumers in the airlines industry. Finally, this study also examines the relationship between the relationship between privacy's antecedents and consumers' actual disclosure behaviour as well as to examine the mediating role of privacy concerns between the relationship of privacy's antecedents and actual disclosure behaviour.

LITERATURE REVIEW

Privacy Calculus Theory

According to (Wirth, 2018), privacy calculus is the most used theory that has been using by the previous researchers in regards to the issues of privacy related. It has been used about the last three times in explaining a dependent variable of privacy issue related. Initially, privacy calculus is used to explain the disclosure of information as a dependent variable. Disclosure of information is a crucial dependent variable as without disclosing information individuals' privacy is usually not threatened.

Privacy calculus is defined as a consequentialist trade-off of cost and benefits that is prominent to determine the behavioural reactions of the individual. Prior research has found these perspectives in various kinds of works (Klopfer & Rubenstein, 1977; Laufer & Wolfe, 1977; Posner, 1981; Smith, Dinev, & Xu, 2011) that view that the concept of privacy as not absolute but rather that the concept of privacy calculus is point to an interpretation in 'economic terms' (Klopfer & Rubenstein, 1977). With regard to this, this kind of calculus perspective of privacy stated that consumers will provide and disclose their personal data and information to corporations and the consumers would perform a risk-benefit analysis in order to asses any outcome they would get in return (Chellapa & Sin, 2005; Culnan, 1993; Dinev & Hart, 2006; Han Li, Sarathy, & Xu, 2010; Milne & Gordon, 1993).

This theory implies that individuals disclose the information if they gain benefits and outweigh the costs of disclosure. This study argues that the dependent variable should be separated into actual disclosure behaviour and intention to disclose. This researcher argues that despite the intention is a good predictor of behaviour, however, in privacy research and other research areas, intention-behaviour gaps have always been recognised in most of the areas of the study. This implies that individuals intend to behave privacy conform but the individuals actually behave in contrast ways. Thus, in this study, this theory is used in determining consumers' actual disclosure behaviour in using self-service technologies in the airline's industry.

Privacy Paradox

Privacy paradox refers to the phenomenon of contradictory ways by the consumers but at the same time have strong privacy concerns. (Pavlou, 2011) Particularly, individuals demonstrate higher levels of actual information disclosure when they claim that they perceive high amounts of privacy risk and low intention to disclose information. (Han Li, Sarathy, & Xu, 2011) argued that privacy paradox could be referred to an attitude-intention rather than an intention-behaviour gap. One of the main research problems in privacy research is about explaining the reasons for the individuals who express their privacy-related concern but it actually differs from their disclosure behaviour.

Social Exchange Theory

The social exchange theory (Emerson, 1972; Homans, 1974) explains the value of social reward or cost to a person depends on how often and how recently the reward or cost was incurred. A person is less likely to perform actions, for instance, registering with a website) that impose a similar cost if a person has encountered recently a cost (information misuse. Therefore, this theory argued that there would be less expect disclosure from those who have experienced information misuse. (Hui, Teo, & Lee, 2007)

Personalities Theory

The Big Five Model explains the personality theory and stated that personality is an individual trait which means an enduring disposition or propensity towards a given event or object (Kim & Jeong, 2015). In privacy studies, personality has been identified as a major determinant of information privacy concerns in that an individual trait could impact information processing style as well as a belief system (Mount et al., 2005; Smith et al., 1996). Five fundamental personalities have been investigated with most interests are include agreeableness, conscientiousness, extraversion, neuroticism and openness. The five personalities emerged as a widely accepted personality typology (i.e. Big Five model) in the late 1980s (Yeh et al., 2018).

Concept of Self-Service Technologies (SST)

It is a form of service of interaction directly between consumers and technological devices and systems (Beatson, Lee, & Coote, 2007). According to Reinders et al. (2008) traditional full service is increasingly replaced with technology-based self-service (TBSS, technology is a definite term than self-service technology (SST) for most of the literature. This is because the majority of the studies examine different types of self-service based on technology (TBSS) and those are not particular technology themselves. Initially, the development of self-service has started when Clarence Saunders founded Piggly Wiggly in 1916 many decades ago. Piggly Wiggly was the first self-service grocery store then became famous and developed into a large franchise around America. The introduction of self-service has been introducing throughout all retail sector since it was first introduced. According to Shaw, Curth, and Alexander (2004), self-service was a significant factor for the growth of supermarkets in the United Kingdom in the late 1950s. Scherer, Wünderlich, and von Wangenheim (2015) suggest a positive impact for both the economy and individual businesses from modular designs. In this study, it illustrates the emerging use of self-service for co-production. This study also illustrates the benefits for consumers and economic such as increasing productivity, cost reductions and the ability to use self-service machines without using the employees.

Technology Adoption

The use of SST offers benefits and goods to consumers. It is described as a time and cost savings as well as greater control over the service delivery. The other benefits include reduce waiting time, effective, efficiency,

spontaneous delight and, fun and enjoy in using technology, attractive, convenient (Curran, Meuter, & Surprenant, 2003). The introduction of SST into the service encounter has brought to a threat issue. It causes anxiety and stress for the consumers who uncomfortable in using the technologies. The consumers have a doubt in dealing with the technology for any problems occur. There are some consumers who do not think that the introduction of technology brings any benefits (Curran et al., 2003). The classifications of SST may be varying in its usage. The consumers experience a variety of SST available in today's advanced world. There are many types of technology interfaces including telephone-based technologies, various interactive voice response systems, direct online connections and internet-based interfaces. The other examples are including interactive free-standing kiosks and video or compact disc (CD) technologies. The implementation of SST by the companies provides several purposes to the consumers. One of the reasons is the technology is seen as the form of many services for a consumer to experience with (Meuter et al., 2000).

Self-service Technologies (SST) in the Airline's Industry

Travelling and leisure are considered as one of the best-selling products on the Internet (López-Bonilla & López-Bonilla, 2013). Travels and tourism accommodations have rapidly become the largest category of products sold on the Internet (Wolfe, Hsu, Kang, Wolfe, & Hsu, 2004). Airlines ticket in particular, appropriate for online distribution as it can be represented by electronic means (Klein, Köhne, Öörni, & Klein, 2004). Internet presents a distribution channel for consumers so it will enable a rapid and convenient to book online with substantial price savings. E-ticket is a commercial format that can be used by both service providers and intermediaries. In many years back, consumers had given no chance in taking part when the process of transport ticket was completely carried out by both service providers and intermediaries (López-Bonilla & López-Bonilla, 2013). The e-ticket is best considered as an innovative service and as a self-service technology system. SST used can be divided into their own classifications from the consumers' viewpoints. These include direct online connections and, interactive kiosks and video technologies (Meuter et al., 2000). In meanwhile, there are several purpose SST which are direct transactions, self-help and gaining different service for consumers. The e-ticket is the best example of the online combination of the technological interface such as the Internet, the purpose of a direct transaction, allowing consumers to book their seats on a plane without interaction with the airlines' employees (López-Bonilla & López-Bonilla, 2013).

Information Technologies and the Phase and Evolution of Technology and Systems

In the early 1950s, the reservations were made on manual display boards and the list passengers were listed. It took some process to get everything done in good ways and methods. In issuing the tickets manually, the travel agencies had to find the best fares and routes for the consumers manually such as World Airways Guide ABC and Official Airline Guide (OAG) and made a phone call asking for availability, reservation and confirmation. (Buhalis, 2000). The airline's industry all over the world is gaining an utmost trend in adopting a sophisticated self-service automated ticketing and check-in-systems as the approaches in today's world advances. This is needed in enabling the employees to cope with high demand in air travel. Douglas F Kelly was the one who introduced "sky-link, self-service ticketing computer terminal". It was an intelligent and programmable self-service that was highly flexible. The system was invented with the functions of flight enquiries, printing and issuance of tickets, reservations through the computer and payment via inquiries. The functions are including self-service check-

in, baggage tags and boarding cards (Kelley, 1984). The first history took place with the introduction of Computer Reservation System (CRS), the emerging of the internet and the world wide web and followed by the four global distribution system (GDS) in the travel industry.

Airlines Industry in Malaysia

The airline industry in Malaysia has been developing hugely for the last many years ago. Malaysia Airlines and AirAsia are best known as the main players in the industry. Malaysia Airlines Berhad is the national carrier and founded as Malayan Airways in 1947. After many years ahead, in 1973 the company reorganise and known as Malaysia Airline Limited and then afterwards renamed as Malaysian Airline System Berhad (MAS) which is simply known Malaysia Airlines (Zulhuda & Delpisheh, 2011) the coming of this law could resemble the arrival of a long-awaited messiah expected to correct the evils and rectify people's problem in a very immediate manner. Once the law is in force, a wide range of industries that process personal data of individuals would have to reformulate their entire business processes to comply with the new legal requirements. In order to do that, they will need to perform critical self-assessment to ensure their business practice does not contravene the law and not trigger criminal liabilities. Against this background, this paper seeks to analyze how the Malaysian airlines industries – represented by the two biggest players Malaysian Airlines (MAS. On the other hand, AirAsia Berhad has been known as the best low-cost carrier around the world and become the best leading cost carrier in the world. They have flown over 70 destinations in more than 20 countries around the world. AirAsia becomes a pioneer of low-cost flights in Asia. They were also the first airline that implements fully ticketless travel in the region (Zulhuda & Delpisheh, 2011)the coming of this law could resemble the arrival of a long-awaited messiah expected to correct the evils and rectify people's problem in a very immediate manner. Once the law is in force, a wide range of industries that process personal data of individuals would have to reformulate their entire business processes to comply with the new legal requirements. In order to do that, they will need to perform critical self-assessment to ensure their business practice does not contravene the law and not trigger criminal liabilities. Against this background, this paper seeks to analyze how the Malaysian airlines industries – represented by the two biggest players Malaysian Airlines (MAS.

Impact of Technology Advancement Evolvement

One of the earliest impacts of the use of SST is the fact that it is changing the way consumers interact with the employees or service providers that enable consumers to do a –self-service method without dealing with any human interaction. The uses of SST among the consumers provide huge benefits to consumers as it is perceived as easy and give benefits to the consumers. The researchers have revealed that the absence of SSTs possesses benefits the consumers in dealing with the technology (Curran et al., 2003; Meuter et al., 2000). Previously, it is defined as easiness of use a particular system without put any effort as it is easy to utilise (Davis, 1989). It is defined as a believed by a person that the use of a particular system would enhance their performance (Kim, Kim, & Shin, 2009; Davis, 1989).

Consumer Information Privacy and Security's Threats

Information privacy is defined as the desire of individuals in controlling and having some influence over data about themselves. (Belanger & Crossler, 2011) The concept of privacy is viewed differently and can be interpreted in many ways. (Stone, Gueutal, Gardner, & Mcclure, 1983) There are four dimensions of privacy which are privacy of the persons, privacy of personal behaviour, privacy of personal communications and privacy of personal data. (Clarke, 1999).

Consumers' Actual Disclosure Behaviour

Most organisations require the consumers to disclose items of personal data or to accept the organisations' collection by other means such as automated in providing the service to consumers. The consumers assess both social and economic benefits of comply the data practice weigh it against the privacy cost of the disclosure. Consumers will disclose their data if they perceive the benefits of the exchange are bigger that the costs itself. However, consumers will refuse to disclose their personal data and information if they

There has been little and limited studies done on a prior research about the consumers' actual closure behaviour. Despite the limitation of the study, studies by (Sayre and Horne, 2000) found that consumers would freely trade their personal data and information in exchange for small discounts at a grocery store. According to (Patricia A, Daniel R, & David A, 2007) when an individual is in an disclosure situation in which the consumers are asked for information during a marketing exchange, trust as an environmental cue is expected to be relied upon and significantly influence response.

Disclosure as Behaviour

The act of disclosure could be considered similar to the actual behaviour construct that which is found in the theory of planned behavior (Ajzen, 1991). Literally, disclosing any sensitive information is the concept of the individual that realises that their information is being disclosed and exposed. This is due to the consequences and effects that are associated with disclosure of sensitive information. Initially, the act of disclosure is preceded by the intention to disclose that assumes by the current research model.. This aspect provides for a similar construct in the TPB framework called intention. Intention in the TPB framework is succeeded by the actual behavior. A subject's intent (ion) to perform a particular behaviour is assumed to derive the motivation to perform that behaviour and the amount of effort the subject will exert to perform that particular behaviour (Ajzen, 1991).

Privacy Concern

Prior several studies have operationalised privacy concerns in-depth and thorough. There are four data related dimensions of privacy concerns which are collection, errors, secondary use and unauthorised access to information. This refers to the concern for information privacy (CFIP) scale that was developed by Smith et al. (1996). These dimensions were revalidated by Stewart and Segars (2001) and have served as some of the most reliable scales in measuring the individuals' concerns toward organisational privacy practices (Smith et al., 2011). The dimensions are recently adapted the CFIP into the context of Internet in order to operationalised a multidimensional scale of Internet users' information privacy concerns (IUIPC). Despite the prominent focus on general privacy concerns, emerging evidence suggests that individuals' general privacy concerns might not be entirely sufficient in explaining privacy- related behaviour in a specific transaction. Indeed, several scholars underscore the importance of considering transactional privacy concerns in explaining individuals' privacy trade-off, which is predominantly transaction specific. (Choi & Land, 2016)

Personality Differences

Big-Five personality traits have been found to influence the individual privacy concerns. Personality is an individual trait which means an enduring disposition or propensity toward a given event or object. In privacy studies, personality has been identified as a major determinant of information privacy concerns in that an individual trait could impact someone's behaviour to disclose their personal data and information. There are five fundamental personalities have been investigated with

most interests which are agreeableness, conscientiousness, extraversion, neuroticism and openness. The five personalities emerged as a widely accepted personality typology (i.e. Big Five model) in the late 1980s. Based on numerous empirical evidences, the structures or dimensions of the Big Five personality were consolidated Multiple studies have attempted to understand how each of the five personalities influence individuals' information privacy concerns.(Yeh et al., 2018)

Privacy Experiences

Privacy experiences have been studies by previous studies respectively. The individuals who have been exposed or been a victim of the personal information abuses must have stronger concerns regarding the privacy of information. Some of the consumers encountered loss of their data with their previous experience in using the technologies respectively (Smith et al., 2011).

Privacy Awareness

In a meanwhile, privacy awareness refers to the awareness of individual that is informed about the privacy practices of the particular organisational. Research suggests that the consumers would only trigger about their concern on privacy when the organisations have collected or used their personal information without their permission. Particularly, consumers who are aware of the name removal procedures are tend to be more concerned on their privacy compared to the consumers who are unaware of the name removal procedures.

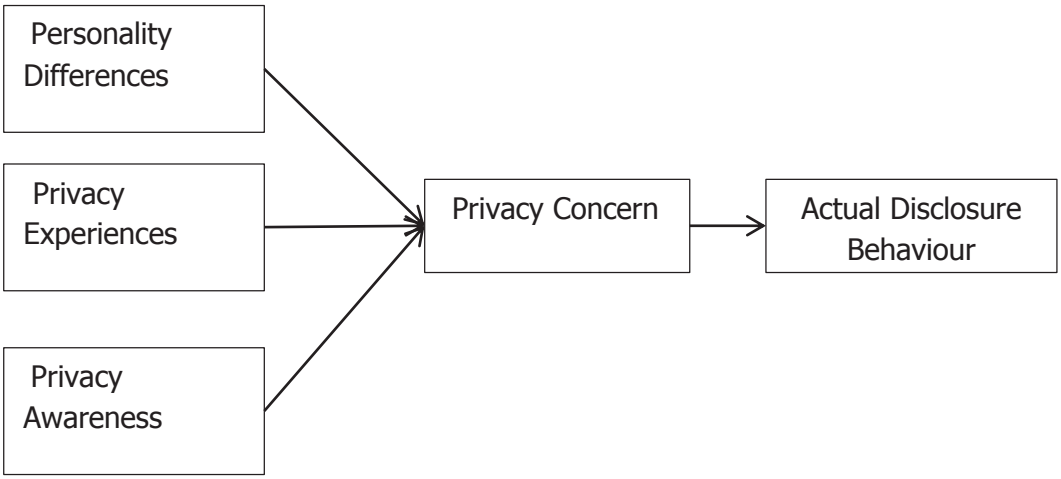
RESEARCH FRAMEWORK AND HYPOTHESES

To date, most extant studies about SSTs have focused on the difference of its comparison of both traditional and SSTs usage as well as its advantages and disadvantages. Despite the perception and the benefits in using technology such as SSTs are essential for the consumers in today's world, the research on empirically examining consumers' actual behaviour of their privacy concern is sparse and limited (He Li, Wu, Gao, & Shi, 2016)this paper explores the predictors of individuals' adoption of healthcare wearable devices. Considering the importance of individuals' privacy perceptions in healthcare wearable devices adoption, this study proposes a model based on the privacy calculus theory to investigate how individuals adopt healthcare wearable devices. Method: The proposed conceptual model was empirically tested by using data collected from a survey. The sample covers 333 actual users of healthcare wearable devices. Structural equation modeling (SEM. By conducting a literature review of the usage of SSTs research, this study found that most extant related studies investigate the consumers' adoption and intention in using SSTs, particularly in the airlines industry. Although the benefits of comparison both traditional and technology plays an important roles in determining the consumers' intention, only few studies have studied about consumers' privacy concern in using the SSTs.

This study regards consumers' actual disclosure behaviour as dependent variable as shown in the conceptual model. In line with previous related studies, this study hypothesize that consumers' actual disclosure are determined by the privacy concern as mediator, particularly their tradeoffs between perceived risk, perceived benefits (privacy calculus) and trust. In addition, this study predicts the antecedents or factors of personality differences, privacy experiences, privacy awareness, cultural differences, demographic, perceived ease of use and perceived usefulness on consumers' actual disclosure behaviour (He Li et al., 2016)this paper explores the predictors of individuals' adoption of healthcare wearable devices. Considering the importance of individuals' privacy perceptions in healthcare wearable

devices adoption, this study proposes a model based on the privacy calculus theory to investigate how individuals adopt healthcare wearable devices. Method: The proposed conceptual model was empirically tested by using data collected from a survey. The sample covers 333 actual users of healthcare wearable devices. Structural equation modeling (SEM.

CONCEPTUAL FRAMEWORK



Actual disclosure behaviour is seen as dependent variables as it is a key variable to determine consumers' actual disclosure in considering their privacy concern using self-service technologies (Barth, Barth, & Jong, 2017) Independent variables in this study include personality differences, perceived usefulness, and perceived ease of use and privacy awareness. It is viewed as a key variable to determine the relationship towards the dependent variables. The independent variables influence on how consumers behaviour causes variation in dependent variables. Mediator variable can be explained as the mechanism that influence both independent variable and dependent variable (Hayes, 2013) Initially, it is a variation in independent variable that causes variation in one or more mediators that influence variation in dependent variable. Previous studies have recommended that the privacy concern is needed to determine consumers' actual disclosure so that in return they will get the benefits using self-service technologies.

A study by (Ferwerda & Schedl, 2016) found that personality traits are correlated with consumers' actual disclosure behaviour. Most significant correlations are found for openness to experience, extraversion, and agreeableness. This study indicated a relation between openness to experience and non-disclosure behaviour while for extraversion it is mainly disclosure behaviour in the like section of a profile. A non-disclosure relationship was found for the agreeableness. Additionally, this study also found that the conscientiousness trait shows overlapping disclosure behaviour with the openness to experience trait, whereas the neuroticism trait shows a more distinct pattern which was a positive relationship was found that neuroticism tend to disclose the birth date. This study also supported by (Bansal, Zahedi, & Gefen, 2010) that different personalities are literally have different characteristics eventually would lead to their actual disclosure behaviour. Thus it was hypothesized that:

H1: There is a significant relationship between personality differences and actual disclosure behaviour

This hypothesis is supported by (Jia, Carroll, Wisniewski, Rosson, & Xu, 2015) that there is a significant relationship between privacy experiences and actual disclosure behaviour. Consumers experience different types of life experiences. Hence, when it comes to a matter of disclosing personal data and information, consumers would consider their decision wisely because of the previous experience they had prior in life. Another study by (Iyamu & Ngqame, 2017) also stated that privacy experiences have significant relationship with actual disclosure behaviour. Thus it was hypothesized that:

H2: There is a significant relationship between privacy experiences and actual disclosure behaviour

(Dinev et al., 2006) found that privacy awareness is correlated with actual disclosure behaviour. The individuals that have a higher awareness are more likely to not disclose their personal information data. They gained the experienced in using self-service technologies and aware to the usage pertaining any disclosing personal data and information. A study by (Inkook Sim, 2010) found the significant relationship between privacy awareness and actual disclosure behaviour. Thus it was hypothesized that:

H3: There is a significant relationship between privacy awareness and actual disclosure behaviour

People that tend to concern higher about their risk tend to not disclose their personal disclosure information since they have higher concerns of privacy. People would consider benefits and risk before disclosing their information (Smith et al., 2011). Some people would rather not to disclose their information because they perceived risk as their main concerns. This is also supported by (F. Xu, Michael, & Chen, 2013) that privacy concern have significant relationship with the actual disclosure behaviour. Thus it was hypothesized that:

H4: There is a significant relationship between privacy concern and actual disclosure behaviour

Personality differences have been found to have a significant relationship with privacy concern. (Smith et al., 2011) Another study by (Osatuyi, 2015) to have found that the big five personality also have significant relationship with privacy concern. Another study by (Jin, 2016) also have found a significant relationship with privacy concern. These are more likely due to an individual's preferences and personality towards their perception on privacy concern. Thus it was hypothesized that:

H5: There is a significant relationship between personality differences and privacy concern

This is supported by (Kehr, Wentzel, & Mayer, 2013) that the consumers' privacy experiences have the significant relationship with privacy concern. Another study by (Smith et al., 2011) supported this significant relationship stating that consumers have the experience about their information privacy and aware that privacy concerns are issues that need to be taken care of before disclosing any personal data and information. Literally, consumers would experience different things in particular, privacy issues that would raise their concern in using particular technologies. Thus it was hypothesized that:

H6: There is a significant relationship between privacy experiences and privacy concern

(Dinev et al., 2006) found that privacy awareness is correlated with privacy concern. The individuals that have a higher concern

on social awareness are more likely aware of privacy issues developments and privacy policies. This is also supported by (Offor, 2016)as the consumer's desired state of information privacy, information privacy self-interest, information privacy permeability, and information privacy equipoise constructs, to examine the causal relationship among the constructs and between a consumer's selective personal information disclosure behavior variable. The theoretical model was advanced based on the conceptual framework in PRT and was validated using Structural Equation Modeling. In addition, the study conducted hypothesis testing and factor analysis using Confirmatory Factor Analysis in order to determine the existence of statistical significance and causality. The result indicates that the consumers' willingness to transact online and disclose their personal information depend largely on the degree of their need signal (self-interest that the more people aware their surrounding and environment the more they alert and concern their privacy to prevent any misconduct and misuse information. Thus it was hypothesized that:

H7: There is a significant relationship between privacy awareness and privacy concern

SIGNIFICANCE OF THE STUDY

This study will supplement the previous literature regarding SST usage in the airline's industry. Most of the previous studies were interested in the advantageous and benefits of using SSTs due to its features of convenience, user-friendly and time-saving. However, little empirical research has attempted to focus on consumers' privacy concern in using SSTs. This research will examine consumers' actual disclosure behaviour in using SSTs which are becoming important recently. Thus, this study will provide more precise insights into the consequences of their behaviour in disclosing personal data and information.

Nonetheless, this study will offer several contributions for consumers, companies, government and privacy seal issuers. Growing concern by the consumers about their privacy has put pressure on the companies to develop consumer-focused privacy practices (Culnan, 2000; Culnan & Armstrong, 1999). Prior research has shown that by posting a privacy policy on the mobile apps, website and kiosk machines could eventually reduce the consumers' perception and perceived privacy concern about providing personal data and information. In spite of the fact that the existence of a privacy policy statement affects the individuals' behaviour, it appears that the privacy policy statement's content does not affect consumers' behaviour. The individuals' decision of information disclosure is likely affected by a post of the privacy policy statement of the company than the details of their privacy practices (Won, 2007).

CONCLUSION

Privacy issues in the usage of SSTs are becoming increasingly prevalent. This study is one of the first attempts to develop a holistic view to understand and examine on these consumers' actual disclosure behaviour by extending the theory of privacy calculus to the context of SSTs in the airline's industry. Based on the literature review, an integrated conceptual framework is developed to consolidate the theories for a better understanding of consumers' actual disclosure behaviour of their privacy concern in using SST. Two interrelated trade-offs in privacy decision are focused on the privacy calculus model

REFERENCES

Abdelaziz, S. G., Hegazy, A. A., & Elabbassy, A. (2010). Study of airport self-service technology within experimental research of check-in techniques. *International Journal of Computer Science Issues*, *7* (3), 17 – 26.

Andrade, E. B., Kaltcheva, V., & Weitz, B. (2002). Self-disclosure on the web: The impact of privacy policy, reward, and company reputation. *Advances in Consumer Research*, *29* (1), 350 – 353.

Asinari, M. V. P., & Poullet, Y. (2004). The airline passenger data disclosure case and the EU-US debate. *Computer Law and Security Report*, *20* (2), 98 – 116.

Bansal, G., Zahedi, F. M., & Gefen, D. (2010). The impact of personal dispositions on information sensitivity, privacy concern and trust in disclosing health information online. *Decision Support Systems*, *49* (2), 138 – 150.

Barth, S., Barth, S., & Jong, M. D. T. De. (2017). The privacy paradox – Investigating discrepancies between expressed privacy concerns and actual online behavior – A systematic literature review telematics and informatics the privacy paradox – Investigating discrepancies between expressed privacy concern. *Telematics and Informatics*, *34* (7), 1038 – 1058.

Beatson, A., Coote, L. V., & Rudd, J. M. (2006). Determining consumer satisfaction and commitment through self-service technology and personal service usage. *Journal of Marketing Management*, *22* (7 – 8), 853 – 882.

Beatson, A., Lee, N., & Coote, L. V. (2007). Self-service technology and the service encounter. *Service Industries Journal*, *27* (1), 75 – 89.

Belanger, F., & Crossler, R. E. (2011). Privacy in the digital age: A review of information privacy research in information systems. *MIS Quarterly*, *35* (4), 1017 – 1041.

Boje, H., & Version, D. (2009). Privacy implications of surveillance systems.

Buhalis, D. (2000). Tourism and information technologies: Past, present and future. *Tourism Recreation Research*, *25* (1), 41 – 58.

Chellapa, R. K., & Sin, R. G. (2005). Personalization versus privacy: An empirical examination of the online consumer's dilemma. *Journal of Information Technology and Management*, *6* (2 – 3), 181 – 202.

Cho, W., & Olsen, M. D. (1998). A case study approach to understanding the impact of information technology on competitive advantage in the lodging industry. *Journal of Hospitality and Tourism Research*, *22* (4), 376 – 394.

Choi, B. C. F., & Land, L. (2016). The effects of general privacy concerns and transactional privacy concerns on Facebook apps usage. *Information and Management*, *53* (7), 868 – 877.

Clarke, R. (1999). Internet privacy concerns confirm the case for. *Communications of the ACM*, *42* (2), 60 – 67.

Culnan, M. J. (1993). "How did they get my name?": An exploratory investigation of consumer attitudes toward secondary information use. *MIS Quarterly*, *17* (3), 341.

Culnan, M. J., & Armstrong, P. K. (1999). Information privacy concerns, procedural fairness, and impersonal trust: an empirical investigation. *Organization Science*, *10* (1), 104 – 115.

Cunningham, L. F., Young, C. E., & Gerlach, J. (2009). A comparison of consumer views of traditional services and self-service technologies. *Journal of Services Marketing*, *23* (1), 11 – 23.

Curran, J. M., Meuter, M. L., & Surprenant, C. F. (2003). Intentions to use self-service technologies: a confluence of multiple attitudes. *Journal of Service Research*, *5* (3), 209 – 224.

Davis, F. D. (1989). Perceived Usefulness, perceived ease of use, and user acceptance of. *MIS Quarterly*, *13* (3), 319 – 340.

De Cristofaro, E. (2011). *Sharing sensitive information with privacy*. *ProQuest Dissertations and Theses*.

Dinev, T. (2014). Why would we care about privacy? *European Journal of Information Systems*, *23* (2), 97 – 102.

Dinev, T., Bellotto, M., Hart, P., Russo, V., Serra, I., & Colautti, C. (2006). Privacy calculus model in e-commerce - A study of Italy and the United States. *European Journal of Information Systems*, *15* (4), 389 – 402.

Dinev, T., & Hart, P. (2003). Privacy Concerns and Internet Use-a Model of Trade-Off Factors. *Academy of Management Proceedings*, (1), 1 – 32.

Dinev, T., & Hart, P. (2006). An extended privacy calculus transactions model for. *Information Systems Research*, *17* (1), 61 – 80.

Elliott, K. M., Hall, M. C., & Meng, J. (2012). The influence of technology readiness on the evaluation of self-service technology attributes and resulting attitude toward technology usage. *Services Marketing Quarterly*, *33* (4), 311 – 329.

Ferwerda, B., & Schedl, M. (2016). Personality traits and the relationship with (non-) disclosure behavior on Facebook. In *Proceedings of the 25th International Conference Companion on World Wide Web* (pp. 565 – 568).

Fitzsimmons, J. A. (2003). Is self-service the future of services? *Managing Service Quality: An International Journal*, *13* (6), 443 – 444.

Friedewald, M., & Pohoryles, R. J. (2013). Technology and privacy. *Innovation*, *26* (1 – 2), 1 – 6.

Garbarino, E., & Olivia, F, L. (2003). Dynamic pricing in internet retail: Effects on consumer trust. *Psychology and Marketing*, *20* (6), 495 – 513.

Gerber, N., Gerber, P., & Volkamer, M. (2018). Explaining the privacy paradox: A systematic review of literature investigating privacy attitude and behavior. *Computers and Security*, *77*, 226 – 261.

Gures, N., Inan, H., & Arslan, S. (2018). Assessing the self-service technology usage of Y-Generation in airline services. *Journal of Air Transport Management*, *71* (April), 215 – 219.

Hui, K. L., Teo, H. H., & Lee, S. Y. T. (2007). The Value of privacy assurance: An exploratory field experiment. *MIS Quarterly*, *31* (1), 19 – 33.

Inkook Sim. (2010). *Online information privacy and privacy protective behavior: how does situation awareness matter?*

Iyamu, T., & Ngqame, Y. (2017). Towards a conceptual framework for protection of person information from the perspective of activity theory. *South African Journal of Information Management*, *19* (1), 1 – 7.

Jia, H., Carroll, J. M., Wisniewski, P. J., Rosson, M. B., & Xu, H. (2015). Risk-taking as a learning process for shaping teen's online information privacy behaviors. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (pp. 583 – 599).

Jin, S. (2016). *Understanding information privacy in the age of social media: cultural privacy boundary framework*.

Kehr, F., Wentzel, D., & Mayer, P. (2013). Rethinking the privacy calculus: on the role of dispositional factors and affect. In *Thirty Fourth International Conference on Information Systems* (pp. 1 – 10).

Kelley, D. F. (1984). Skylink self-service ticketing terminal: Design and ergonomics. *Behaviour and Information Technology*, *3* (4), 391 – 397.

Kim, H. bumm, Kim, T. (Terry), & Shin, S. W. (2009). Modeling roles of subjective norms and eTrust in customers' acceptance of airline B2C eCommerce websites. *Tourism Management*, *30* (2), 266 – 277.

Klein, S., Köhne, F., Öörni, A., & Klein, S. (2004). Barriers to online booking of scheduled airline tickets, *17* (2–3), 27 – 39.

Klopfer, P. H., & Rubenstein, D. I. (1977). The concept privacy and its biological basis. *Journal of Social Issues*, *33*(3), 52–65.

Kokkinou, A., & Cranage, D. A. (2015). Why wait? Impact of waiting lines on self-service technology use. *International Journal of Contemporary Hospitality Management*, *27* (6), 1181 – 1197.

Ku, E. C. S., & Chen, C. Der. (2013). Fitting facilities to self-service technology usage: Evidence from kiosks in Taiwan airport. *Journal of Air Transport Management*, *32*, 87 – 94.

Laufer, R. S., & Wolfe, M. (1977). Privacy as a social issue: a multidimensional development theory. *Journal of Social Issues*, *33* (3), 22 – 42.

Li, Han, Sarathy, R., & Xu, H. (2010). Understanding situational online information disclosure as a privacy calculus. *Journal of Computer Information Systems*, *51* (1), 62 – 71.

Li, Han, Sarathy, R., & Xu, H. (2011). The role of affect and cognition on online consumers' decision to disclose personal information to unfamiliar online vendors. *Decision Support Systems*, *51* (3), 434 – 445.

Li, He, Wu, J., Gao, Y., & Shi, Y. (2016). Examining individuals' adoption of healthcare wearable devices: An empirical study from privacy calculus perspective. *International Journal of Medical Informatics*, *88* (555), 8 – 17.

López-Bonilla, J. M., & López-Bonilla, L. M. (2013). Self-Service Technology versus traditional service: examining cognitive factors in the purchase of the airline ticket. *Journal of Travel and Tourism Marketing*, *30* (5), 497 – 508.

Lu, J. L., Chou, H. Y., & Ling, P. C. (2009). Investigating passengers' intentions to use technology-based self check-in services. *Transportation Research Part E: Logistics and Transportation Review*, *45* (2), 345 – 356.

Lwin, M. O., & Williams, J. D. (2003). A model integrating the multidimensional developmental theory of privacy and theory of planned behavior to examine fabrication of information online. *Marketing Letters*, *14* (4), 257 – 272.

Mathew, J. (2008). *Disclosure apprehension: the influence of media and survey technique on the disclosure of sensitive information*.

Meuter, M. L., Bitner, M. J., Ostrom, A. L., & Brown, S. W. (2005). Choosing among alternative service delivery modes: an investigation of customer trial of self-service technologies. *Journal of Marketing*, *69* (2), 61 – 83.

Meuter, M. L., Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-Service technologies: understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, *64* (3), 50 – 64.

Millet, A. (2015). *Airline vulnerabilities to a cyber-attack and the potential consequences*.

Milne, G. R., & Gordon, M. E. (1993). Direct mail privacy-efficiency trade-offs within an implied social contract framework. *Journal of Public Policy & Marketing*, *12* (2), 206 – 215.

Moorman, C., Deshpande, R., & Zaltman, G. (1993). Factors affecting trust in market research relationships. *Journal of Marketing*, *57* (1), 81 – 101. Retrieved from http://www.jstor.org/stable/1252059

Offor, P. I. (2016). *Examining consumers' selective information privacy disclosure behaviors in an organization's secure e-commerce systems*. Retrieved from http://nsuworks.nova.edu/gscis_etd

Ong L. (2010). *Can self service technologies work in the hotel industry in Singapore? A conceptual framework for adopting self service technology*.

Osatuyi, B. (2015). Personality traits and information privacy concern on social media platforms. *Journal of Computer Information Systems*, *55* (4), 11 – 19.

Patricia A, N., Daniel R, H., & David A, H. (2007). The privacy paradox: personal information disclosure intentions versus behaviors. *The Journal of Consumer Affairs*, *41* (1), 100 – 126.

Pavlou, P. A. (2011). State of the information privacy literature: where are we now and where should we go? *MIS Quarterly*, *35* (4), 977 – 988.

Posner, R. A. (1981). The economics of privacy. *American Economic Association*, *71* (2), 405 – 409.

Ramaseshan, B., Kingshott, R. P., & Stein, A. (2015). Firm self-service technology readiness. *Journal of Service Management*, *26* (5), 751 – 776.

Reinders, M. J., Dabholkar, P. A., & Frambach, R. T. (2008). Consequences of forcing consumers to use technology-based self-service. *Journal of Service Research*, *11* (2), 107 – 123.

Scherer, A., Wünderlich, N. V., & von Wangenheim, F. (2015). The Value of self-service: long-term effects of technology-based self-service usage on customer retention. *MIS Quarterly*, *39* (1), 177 – 200.

Shaw, G., Curth, L., & Alexander, A. (2004). Selling self-service and the supermarket: The Americanisation of food retailing in Britain, 1945 - 1960. *Business History*, *46* (4), 568 – 582.

Smith, H. J., Dinev, T., & Xu, H. (2011). Information privacy research: an interdisciplinary review. *MIS Quarterly*, *35* (4), 989 – 1015.

Stone, E. F., Gueutal, H. G., Gardner, D. G., & Mcclure, S. (1983). A Field Experiment Comparing Information-Privacy Values , Beliefs , and Attitudes Across Several Types of Organizations. *Journal of Applied Psychology*, *68*(3), 459–468.

Strother, J. B., Fazal, Z., & Rettich, K. (2010). From full-service to self-service: The airline industry takes off. *IEEE International Professional Communication Conference*, 191 – 194.

Tam, M. ling, & Lam, W. H. K. (2004). Determination of service levels for passenger orientation in Hong Kong International Airport. *Journal of Air Transport Management*, *10* (3), 181 – 189.

Wirth, J. (2018). Dependent Variables in the Privacy-Related Field: A Descriptive Literature Review. In *Proceedings of the 51st Hawaii International Conference on System Sciences* (Vol. 9, pp. 3658 – 3667).

Wolfe, K., Hsu, C. H. C., Kang, S. K., Wolfe, K., & Hsu, C. H. C. (2004). Buyer Characteristics Among Users of Various Travel Intermediaries Buyer Characteristics Among Users of Various Travel Intermediaries. *Journal of Travel & Tourism Marketing*, *17* (2 – 3), 51 – 62.

Xu, F., Michael, K., & Chen, X. (2013). Factors affecting privacy disclosure on social network sites: An integrated model. *Electronic Commerce Research*, *13* (2), 151 – 168.

Xu, H., Dinev, T., Smith, H. J., Hart, P., & Smith, H. J. (2008). Examining the Formation of individual's privacy concerns: toward an integrative view. In *Twenty Ninth International Conference on Information Systems* (p. 17).

Xu, H., & Gupta, S. (2009). The effects of privacy concerns and personal innovativeness on potential and experienced customers' adoption of location-based services. *Electronic Markets*, *19* (2 – 3), 137 – 149.

Yeh, C. H., Wang, Y. S., Lin, S. J., Tseng, T. H., Lin, H. H., Shih, Y. W., & Lai, Y. H. (2018). What drives internet users' willingness to provide personal information? *Online Information Review*, *42* (6), 923 – 939.

Zeithaml, V. A., & Gilly, M. C. (1987). Characteristics affecting the acceptance of retailing technologies: A comparison of elderly and nonelderly consumers. *Journal of Retailing*, *63* (1), 49 – 68.

Zulhuda, S., & Delpisheh, M. (2011). Personal data "up in the air": A tale of two Malaysian airlines in dealing with consumers online privacy.