

The effects of relationship maintenance and relationship investment on self-service technology relationship performance

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Abstract

Purpose – The purpose of this paper is to extend the utilitarian value of the dedication-based relationship maintenance mechanism of social exchange theory and customer perceived relationship investment to investigate the relationship performance of a retailer launching a self-service technology (SST). Computer anxiety and time consciousness are hypothesized to moderate the effects among these relationships.

Design/methodology/approach – The results of the structural equation model, with in-store kiosk use experience data collected for 211 respondents, supported the research model. Multiple regression analysis was used for testing the moderating effects.

Findings – The utilitarian value of dedication-based relationship maintenance is related to perceived relationship investment. Higher levels of customer-perceived relationship investment impact relationship performance. Computer anxiety and time consciousness act separately as both partial and full moderators.

Research limitations/implications – First, this study did not consider different kinds of products/services to have different effects with regard to customer cognition. Second, most of the respondents were students, and this is a limitation in business research, because of such factors as lower incomes and higher information technology ability as compared to individuals with other occupations. Third, it is difficult to distinguish whether the level of perceived convenience is due to the convenience stores *per se* or the in-store kiosks that they have. Future research may thus consider analyzing in more detail how perceived convenience is evoked. Finally, future research can consider constraint-based relationship maintenance mechanisms with regard to operating in-store kiosk businesses.

Practical implications – Retailers who are willing to continually launch SSTs should tie such efforts to their relationship marketing strategies. Moreover, retailers who are willing to launch e-businesses should establish strategies designed to enhance customer experience with regard to the use of technology. Finally, launching SSTs should involve the continual development of an effective purchasing process and functional relationship marketing strategies.

Originality/value – This paper can help managers organize relationship maintenance mechanisms, especially with regard to the development of user utilitarian value, in order to obtain improved relationship performance.

Keywords Technology adoption, E-marketing, E-service, Service quality (SERVQUAL)

Paper type Research paper

Introduction

In recent years there has been a dramatic increase in the interactions that occur between humans and machine. As a result, the notion of self-service technology (SST) has been drawing a lot of attention from both academics and practitioners, because it is changing the intrinsic practice of service delivery in many industries, such as banking, tourism, and retailing (Johns, 2014; Cunningham *et al.*, 2008). More and more businesses



are now launching SSTs to encourage consumers to produce services for themselves without staff involvement (Meuter *et al.*, 2005). This has led to a decline in the importance of interpersonal, face-to-face, relationships in a service delivery context.

Social exchange theory (SET) has been widely applied in the literature to explain not only interpersonal relationships, but also many other situations (e.g. organization-stakeholder relationships and relationship marketing) that are also based on the exchange of resources (Lambe *et al.*, 2001). The interactivity of the resource exchanges promoted by SST providers encourages the customer to change from a passive service recipient to an active participant, making them a co-producer in the self-service environment (McCabe, 2014). Recognition of the role that the customer plays in co-production of value will enhance customer commitment, loyalty, and trust, and thus encourage relationship building in SST settings (Richard and Zhang, 2012; McCabe, 2014). Johns (2014) viewed SET from a relationship marketing perspective, and argued that customer commitment and loyalty are associated with a customer's evaluation of SST's performance in handling the overall experience, and how this compares to interpersonal service delivery. This implies that customer commitment in the change from interpersonal service delivery to SST delivery is based firmly on the consumer's evaluation of their experience with an SST (Deel, 2010). According to Harry (2009), customer commitment facilitates relationship building and maintenance between two parties, and thus relationship building in this context will shift from developing an interpersonal relationship to an SST one. Therefore, the overall evaluation of SST usage would influence relationship building as well as the commitment to continue the relationship.

In order to illustrate how businesses formulate strategies to maintain relationships with loyal customers, Kim and Son (2009) applied SET and viewed relationship maintenance mechanisms from two perspectives: constraint-based and dedication-based. Constraint-based relationship maintenance focusses on economic, social, or psychological commitment. In contrast, dedication-based relationship maintenance is an attitudinal commitment derived from genuine appreciation for a relationship. Hennig-Thurau *et al.* (2000) further indicated that the functioning of dedication-based relationships can be depicted from a benefit-focus perspective, while constraint-based relationships are better viewed from a dependency perspective. Restated, dedication-based relationships represent that two parties "want to" continue the relationship, but constraint-based relationships represent that they "have to" stay in the relationship.

According to figures for 2014, Taiwan has the highest density of convenience stores in the world (Ministry of Foreign Affairs, 2014). However, only the top three convenience stores have launched SSTs to enhance their product/service variety and offer quality e-services to establish and enhance their customer relationships. Taiwanese people enjoy going to convenience stores and using SSTs (i.e. in-store kiosks) to search for travel information, pay bills, purchase tickets, and so on, because this technology provide them with clear, practical value, being both convenient and efficient (Kim and Son, 2009; Kleijnen *et al.*, 2007). An examination of how Taiwanese convenience stores have launched SSTs may improve understanding of SST relationship marketing operations. Accordingly, the positive SST utilitarian value of dedication-based relationship maintenance mechanisms tends to enhance commitment to SSTs in convenience stores, particularly among more time conscious consumers (Bolton *et al.*, 2004; De Wulf *et al.*, 2001; Kim and Son, 2009; Kleijnen *et al.*, 2007; Zhu *et al.*, 2007). However, some people might feel that the use of computers in

this way limits their ability to shop easily (Kim and Forsythe, 2008). Retailers facing computer anxious consumers must thus develop strategies to encourage them to use this technology in order to complete a desired task (e.g. travel, shopping, and so on) (Reinders *et al.*, 2008).

Zhou *et al.* (2012) indicated that little research has discussed perceived customer utilitarian value as one of the retailer dedication-based relationship maintenance mechanisms that may impact the perceived relationship investment. In addition, past studies have not discussed the link between customer perceptions of how businesses invest their resources in relationship maintenance and the effects of relationship performance on evaluations of businesses, especially in the case of SST businesses (Zhu *et al.*, 2007). Further, few studies have suggested that there is a relationship between the cognition of customers with computer anxiety and the relationship between dedication-based relationship maintenance mechanisms and customer perceptions of e-business investment in resources for the purpose of relationship building (Reinders *et al.*, 2008). This relationship becomes an important issue for retailers intending to launch in-store kiosk businesses with the aim of increasing market share. Finally, little research has discussed how time conscious consumers perceive the SST investments by retailers to enhance the performance of their relationships (Bolton *et al.*, 2004).

By addressing certain gaps in the literature, this study contributes to SST research in three ways: first, this study applies the utilitarian value of a dedication-based relationship maintenance mechanism, derived from SET, to discuss customer perceptions of investments related to establishing higher relationship performance for SSTs used in retail operations. Second, this study aims to determine whether the utilitarian value of a dedication-based relationship mechanism plays an important role when customers have lower customer anxiety related to the use of computers, and also to determine customer perceptions of retailer investments in building customer relationships. Finally, this study is intended to verify the moderating role of time consciousness on the relationship between customer perceived relationship investment and SST relationship performance.

Theoretical background and conceptual framework

SST in retailing; in-store kiosk

The provision of efficient shopping and cost savings are the goals of all business operations. Hence, more and more retailers are launching SSTs for the purpose of achieving synergy between their customers and their business operations. Indeed, one of the most efficient e-business operations is launching SSTs (Meuter *et al.*, 2000). SSTs not only reduce customer-employee encounters, thus providing efficient shopping, but they also save overhead (e.g. labor costs). An example of this is when TESCO Grocery launched SSTs to replace traditional cashiers. The SST mechanism enhances customer transaction efficiency and saves overhead costs for businesses. Hence, an SST is a functional tool for business operation.

Meuter *et al.* (2000, p. 50) stated that SSTs are “technological interfaces that enable customers to produce a service independent of direct service employee involvement.” Service-oriented firms are increasingly introducing SSTs that substitute traditional human interactions with technological interactions during service encounters (Lin and Hsieh, 2011). This is because SSTs decrease the extent of direct service employee involvement and allow consumers to utilize services without assistance from service personnel. As a result, SSTs offer increased flexibility, greater control over the service process, and deliver time savings as compared to traditional service options (Zhu *et al.*, 2007).

SSTs have been widely applied for many purposes, such as hotel guest check-outs, flight check-ins, banking with ATMs, and at gas stations and supermarkets, among other locations (Meuter *et al.*, 2000). One noticeable trend is the increasing use of SSTs by retailers (Ou *et al.*, 2009). Zhu *et al.* (2007) specified that SSTs in physical stores that are operated for the purpose of customer transactions are called “in-store kiosks.” In fact, in-store kiosks are a kind of retail SST that can help customers independently complete their purchase tasks. Accordingly, SSTs used in retailing, such as in-store kiosks in Taiwanese convenience stores that provide distinctive characteristics (e.g. copy machines, the sale of tickets, bill payments, and among other services) can also provide users with time savings and efficiency when making purchases. Accordingly, retailers are devoting marketing efforts to evoke continuous use of SSTs by customers. In other words, launching efficient shopping strategies and relationship investment lead to the benefit of keeping customers who think time is an essential concern.

In fact, the in-store kiosks not only sell commodities but also services, and increasing the variety of items that a customer can obtain or actions they can carry out, raising perceived convenience (Ganesh *et al.*, 2010). Moreover, the platform design of in-store kiosks in convenience stores focusses on offering a quality platform that can make the purchase process more efficient, and thus encourage customers to continue using SSTs (Delone and McLean, 2004). This is why many convenience stores are willing to invest in-store kiosks for building the relationship with customers. In this study, in-store kiosks are defined as SSTs used in retailing that enable more efficient transactions to occur in a convenience store.

Dedication-based relationship maintenance

SET suggests that people are concerned about the cost and benefits that are generated through interpersonal relationships (Fiske and Taylor, 1984). Indeed, people are willing to exhibit specific behavior as they pay costs (e.g. physiologically or psychologically) or obtain benefits (Blau, 1964; Homans, 1961). Accordingly, marketing literature has specified business strategies that can provide customer benefits or generate customers who invest their personal resources on developing long-term relationships with businesses. In other words, these businesses usually apply relationship maintenance strategies that cause users to invest personal resources as the “cost” and also attempt to determine the customers’ perceived benefits in order to develop continued use behavior (Katz and Shapiro, 1985). This process can escalate long-term benefits to businesses using such strategies.

Further, Kim and Son (2009) proposed a dual model in regard to the online customer post-purchase phenomenon. Indeed, their research was based on SET in order to illustrate businesses that formulate strategies to maintain loyal customers. The strategies were called dedication-based relationship maintenance and constraint-based relationship maintenance. In fact, dedication-based relationship maintenance is based on attitudinal commitment resulting from genuine appreciation for a relationship, such as perceived usefulness. On the other hand, constraint-based relationship maintenance centers on locked-in “economic, social, or psychological” commitment, such as dependency (Kim and Son, 2009). Users invest their economic, social, or psychological resources when purchasing. Further, this study argued that convenience stores have developed in-store kiosks for customers in order to make purchasing useful. A utilitarian SST will evoke customer dedication to the relationship (Dey *et al.*, 2011; Zhou *et al.*, 2012). However, few studies have deeply discussed the relationship between utilitarian values as the driver that evokes customer dedication to a relationship. Consequently, this study is intended to bridge this research gap.

Utilitarian value

Utilitarian value in information technology is centered on the user perceiving an information system as useful and is related to the benefit perceptions of use as well (Dey *et al.*, 2011; Zhou *et al.*, 2012). Accordingly, in this study, it is specified that information technology for businesses that focus on the utilitarian value of system design will provide functional information technology for businesses that will attract the genuine appreciation of customers (Delone and McLean, 2004; Kim *et al.*, 2012; Zhou *et al.*, 2012). Hence, this study integrates the useful features of convenience stores launching dedication-based relationship mechanisms in in-store kiosk businesses and discusses business relationship-building performance as well.

Merchandise variety in in-store kiosks is a key factor related to the success of in-store kiosk businesses in Taiwanese convenience stores. Hence, convenience stores launching in-store kiosk business are willing to present complementarity features derived from customer perceptions in order to evoke customer loyalty intention as well-being willing to invest their resources in building relationships with customers. In other words, customers who have experience variety in product/service selections through in-store kiosks obtain utilitarian value from the purchase channel. Hence, perceived complementarity is the key success factor in in-store kiosk business operations. Finally, this study is also intended to discuss the direct effect between perceived complementarity and relationship performance and the indirect effect between perceived complementarity and relationship performance through perceived relationship investment.

Retailers who launch SSTs usually adopt characteristics that result in users perceiving a quality function from their purchasing processes in order to achieve user utilitarian perceptions (Zhou *et al.*, 2012). In the case of Taiwanese convenience stores, in-store kiosk SST businesses usually develop features that evoke customer perceived benefits and utilitarian value perceptions (Kim and Son, 2009; Zhou *et al.*, 2012) instead of the customers having to invest their personal resources in figuring out how to use the system.

This study suggests that in-store kiosks should also provide novelty products/services beyond customer expectation for the SST (Chiu *et al.*, 2010), including such things as laundry services and calling taxis, among other products/services. Customers who can get novel products/services through in-store kiosk will view such an experience as useful.

This study suggests that in-store kiosks in convenience store that focus on the utilitarian value of the in-store kiosk system design will provide functional information technology for businesses that will attract the genuine appreciation of customers (Delone and McLean, 2004; Kim *et al.*, 2012; Zhou *et al.*, 2012) related to perceived complementarity, e-service quality, and perceived novelty. Consequently, this study is based on utilitarian in-store kiosk features and relationship investment, and also discusses relationship performance in convenience store in-store kiosk business operations.

Perceived relationship investment

The creation of long-term relationships with customers can bring long-term benefits related to business survival in competitive markets (Fernández-Sabiote and Román, 2012). De Wulf *et al.* (2001) developed a model and pointed out that retailers direct their marketing efforts to evoke customer perceptions that the retailers are investing their resources in developing long-term relationships. Loyalty intentions will thus develop.

Hence, customer perceived relationship investment is intended to determine customer loyalty intention. Accordingly, perceived relationship investment refers to “a customer’s perception of the extent to which a retailer devotes resources, efforts, and attention aimed at maintaining or enhancing relationships with regular customers that do not have outside value and cannot be recovered if these relationships are terminated” (De Wulf *et al.*, 2001). Further, perceived relationship investment impacts customer commitment to retailers (De Wulf *et al.*, 2001). Hence, in this study perceived relationship investment is defined as retailers directing their marketing efforts to evoke customer perceptions of relationship investment building, thus leading to eventual establishment of long-term relationships with the retailer.

Perceived relationship investment can be measured by e-customer relationship building perceptions. Also, efficiency in regard to transactions and time savings are two important features that people need in the current market environment (Kleijnen *et al.*, 2007). SST business setting is relationship building directed by the retailer. In fact, retailers launch SSTs to provide customers with a new shopping method intended to meet their needs for efficiency and time saving features (Zhu *et al.*, 2007). In other words, a functional SST that develops relationship building resources (such as, care about customers’ shopping need) will develop positive relationship investment perceptions toward the convenience store. This is usually related to the business making and effort with regard to relationship building (De Wulf *et al.*, 2001). Hence, this study defined perceived relationship investment as customer perceptions that a retailer has invested resources in long-term relationship building through the use of SSTs in their retail operations.

Kim and Son (2009) argued that customer-perceived benefits impact customer loyalty. Also, Oliver’s (1999) attitude-based framework offers theoretical illustrations of the positive relationship between perceived benefits and loyalty. Further, De Wulf *et al.* (2001) proposed a model that illustrates the idea that customers consider the benefits that retailers provide, and suggested that positive relationship quality and loyalty intention will develop along with these benefits. Hence, this study proposes that dedication-based relationship mechanisms launched by retailers are related to perceived relationship investment and relationship performance.

Relationship performance

Businesses usually consider relationship performance to be the measurement of relationship building with customers (Hossain and Quaddus, 2011; Verhoef, 2003; Zhang *et al.*, 2008). Crosby *et al.* (1990) argued that customers who are satisfied with retailers will feel greater commitment toward them. Long-term customer retention is based on consumer attitudes toward firms. Measurements of customer based relational performance stress the evaluation of the relationship between firms and customers based on customer attitudes toward a given firm (Chang *et al.*, 2014). Accordingly, a customer who intends to continually commit to a relationship with a product or service provider contributes to better relationship performance. This also focusses on the customer committing to a certain supplier (Bolton *et al.*, 2004). Relationship performance is defined as the customer’s future purchasing behavior. In fact, the length, breadth, and depth of customer purchasing behavior are measurement of customer loyalty behavior (Bolton *et al.*, 2004). This information can result in retailers having a more in depth understanding of the loyalty relationship. Accordingly, relationship performance includes relationship length, relationship depth, and relationship breadth (Bolton *et al.*, 2004), and it is illustrated as follows.

Relationship length. Bolton *et al.* (2004) proposed that the “duration” of a transaction is the length of the relationship. Verhoef (2003) pointed out that customers react subjectively regarding their relationship with a specific product or service provider. However, it is possible to lengthen and extend the relationship (Bolton *et al.*, 2004). In other words, as customers perceive the business-making effort in relationship building, they will accordingly adjust their future behavior (De Wulf *et al.*, 2001).

When convenience stores create strategies for customer relationship building involving SSTs, e.g., merchandise variety in in-store kiosks, quality service, and novel shopping experiences, among others, this will determine the customers intention to make long-term purchasing behavior in the future (Collier and Sherrell, 2010; Chiu *et al.*, 2010; Crosby *et al.*, 1990; De Wulf *et al.*, 2001; Kim and Son, 2009). Thus, relationship length is defined as the duration of customer willingness to transact with certain retail SSTs in the future.

Relationship depth. Relational depth is measured by “how often” a customer purchases in a certain store (Bolton *et al.*, 2004). In this research, this is called “frequency of purchase.” Indeed, customers having positive relationship investment perceptions with regard to a retailer will determine to commit to the relationship (Collier and Sherrell, 2010; Chiu *et al.*, 2010; Crosby *et al.*, 1990; De Wulf *et al.*, 2001; Kim and Son, 2009). Frequency of purchase behavior will go along with their commitment relationship (Bolton *et al.*, 2004). Hence, relationship depth is defined as customer willingness to frequently transact using certain SSTs in the future.

Relationship breadth. Bolton *et al.* (2004) found that relational breadth is measured by customer “cross-buying intentions.” Customers performing cross-buying in certain stores help retailers create unexpected revenue (Bolton *et al.*, 2004; Zhang *et al.*, 2008). Thus, retailers should create circumstances that provide associated products for customers who have cross-buying motivation, thus creating additional benefits. Indeed, a customer committed to a certain retailer usually brings extra benefits to that retailer; such as, cross-buying behavior that will bring extra revenue to the business. Accordingly, customers perceive that a convenience store is devoting its marketing efforts to evoking a positive customer SST relationship investment perception. These perceptions will evoke customer commitment to the transaction relationship (Collier and Sherrell, 2010; Chiu *et al.*, 2010; Crosby *et al.*, 1990; De Wulf *et al.*, 2001; Kim and Son, 2009). Hence, relationship depth is defined as customer intention to conduct cross-buying behavior in certain SST in retailing in the future.

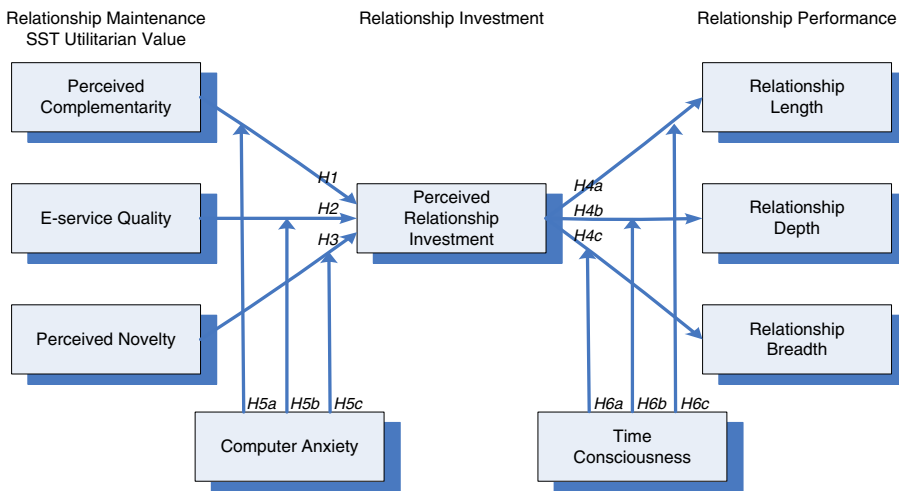
Accordingly, the conceptual framework guiding this study is presented in Figure 1. This study employs the utilitarian value of dedication-based relationship mechanism from SET to discuss customer perceived relationship investment toward a retail SST. In fact, the baseline model, which represents the formation of perceived complementarity, e-service quality, and perceived novelty, plays the determinate role in influencing perceived relationship investment. Meanwhile, we discuss customer computer anxiety as having a moderating effect between the dedication-based relationship mechanism and perceived relationship investment. We also discuss customer time consciousness as a moderator between perceived relationship investment and related relationship performance.

Research hypotheses development

The influence of dedication-based relationship maintenance on perceived relationship investment

Katz and Shapiro (1985) based their research on Metcalfe’s law and argued that network externality is technology use relative to use popularity, which was called

Figure 1.
The conceptual
framework



direct network externality. In fact, indirect network externality is perceived product and SSTs as complementarity. Perceived complementarity is defined as when the user base expands, users can obtain lots of complementarity functions and services (Zhou and Lu, 2011) that bring additional value. Hence, many products/services also adopt complementarity strategies to launch in a specific market, e.g., inks and printer are complementarity. By adding a complementarity feature, businesses can strengthen their products/services.

SSTs used in retailing, such as in-store kiosks in Taiwanese convenience stores, apply perceived complementarity of perceived network externality to launch in-store kiosks in order to provide efficient shopping. In fact, in-store kiosks in convenience stores have various products/services that help customers make efficient purchases. Perceived complementarity is defined as when the retailer offers complementarity features in kiosks such as ticket purchasing, paying bills, and copy machines to generate customer benefit perceptions (Oliver, 1999; Zhang *et al.*, 2008). Indeed, synergy will be generated.

According to reciprocal theory, “relationship investment emphasizes an aim for reciprocation by consumers that is based on retention efforts made by a retailer” (Huppertz *et al.*, 1978). Meanwhile, SET specifies that if businesses provide benefits that can be delivered to their customers, it will determine the future behavior of these customers (Kim and Forsythe, 2008). In-store kiosks have various products/services that do not require paying search costs to obtain utilitarian shopping. Customers will perceive the convenience store to have made a positive relationship investment in in-store kiosks. Thus, *H1* is as follows:

H1. Customer perceived complementarity has a positive effect on perceived relationship investment with regard to SST used in retailing.

E-service quality means an overall judgment of a service with more of an emphasis on customers personal feelings regarding the process of service delivery, which contributes to user satisfaction, purchase intentions, and in turn, to firm performance (Lin and Hsieh, 2011; Maditinos and Theodoridis, 2010). Lin and Hsieh (2011) argued that e-service quality is customer perception of SST service quality

delivery in retailing, called "e-service quality." Accordingly, e-service quality is defined as customer's global judgments related to the superiority of an SST in the retail environment that they have chosen.

This study applies the e-service quality measurement of Lin and Hsieh (2011) to discuss an SST service quality evaluation. Accordingly, e-service quality includes the following dimensions: first, functionality means that the SST provides a stable function for customers' smooth and effective manipulation. Second, enjoyment implies that the SST service provider usually provides interesting content that evokes customer enjoyment perceptions, e.g., interactive games. Third, security represents the idea that customers can manipulate SSTs that can protect their personal information, e.g., ID number. Fourth, assurance is that the retailer providing the SST has a good reputation. Fifth, design indicates that the SST has invested resources in a platform designed from customer perceptions, e.g., invested in up-to-date, aesthetically appealing technology. SST in retailing, such as in-store kiosks in convenience stores, exists around customers' lives. The more customers perceive convenience, the more positive is their relationship investment perception. Lastly, customization means an SST used in the retail environment can fulfill customers' specific needs. For example, an in-store kiosk in a convenience store can allow the purchase of registered airline tickets with a receipt instead of booking through a travel agent.

Kim and Son (2009), on the basis of SET, pointed out that e-customers will perceive that utilitarian value from an online business will adjust their future behavior. Hence, SSTs, such as in-store kiosks in Taiwanese convenience stores, provide good service quality related to use of an in-store kiosk for shopping. These benefits will evoke customer perceptions that the convenience store has invested quality e-services in keeping loyal customer relationships. The hypothesis is stated as follows:

H2. Customer perceived e-service quality has a positive effect on perceived relationship investment with regard to SST used in retailing.

Diffusion of innovation was proposed by Rogers (Eze *et al.*, 2014; Rogers, 1983; Wells *et al.*, 2010). The main idea is that the technology user's intention to do behavior is affected by the innovator of the network diffusion in the technology product or service context, and it is based on the network effect (Zhou and Lu, 2011). Wells *et al.* (2010) specified that diffusion of innovation in new product launch contexts considers that customers are aware of the variations in a product after the new product is launched.

Wells *et al.* (2010) argued that past studies do not have a specific construct by which to discuss user perceptions of innovation. Thus, perceived novelty is based on the innovativeness attributes in diffusion of innovation theory. Perceived novelty offers a perspective by which to understand user perceptions that a business launched a novelty product management method that delivers value to the customer.

Customers get novelty use experience when they can select novelty products/services through in-store kiosks in Taiwanese convenience stores. Indeed, in-store kiosks usually slot novel products/services for making purchases, such as laundry services or calling taxis. Hence, perceived novelty is a utilitarian value for customers using technology (Wells *et al.*, 2010). Perceived novelty is thus defined as the novelty products/services that deliver a novel shopping experience through the use of an SST in a retail environment. Hence, customer novelty perceptions will be evoked. In fact, De Wulf *et al.* (2001) also proposed that higher benefits will lead to higher relationship investment perceptions toward a retailer. Meanwhile, providing novel products/services intended to deliver novelty shopping experiences usually attracts customer

attention (Huppertz *et al.*, 1978; Kim and Son, 2009; Rogers, 1983; Wells *et al.*, 2010). Hence, customers will think that in-store kiosks provide relationship maintenance resources and will perceive that the convenience store is devoting relationship resources to retain the customer relationship. The hypothesis is as follows:

H3. Customer perceived novelty has a positive effect on perceived relationship investment with regard to SST used in retailing.

The influence of perceived relationship investment on relationship performance

According to the notion of relationship quality theory (Crosby *et al.*, 1990; De Wulf *et al.*, 2001), it has been proposed that customer commitment can create long-term relationships. Meanwhile, commitment will be determined by the retailer making an effort to establish customer relationships. In particular, business investment of resources in customer relationship building will determine relationship performance.

SSTs used in retailing contexts, such as those used for in-store kiosks in Taiwanese convenience stores, are businesses intended to fulfill customer needs related to transaction efficiency as well as the provision of resources that build customer loyalty intention through in-store kiosk purchase experiences, and may include such things as care about efficient shopping need. Hence, more efficient shopping and relation maintenance resources launched in in-store kiosk businesses will lead to the generation of higher relationship performance (Liang and Chen 2009). The role of interaction orientation and customer relationship management (CRM) readiness exist in the relationship between CRM relational information processes and customer-based relational performance (Chang *et al.*, 2014). Accordingly, this study posits that customer perceptions that businesses are making an effort in in-store kiosk transactions to fulfill their efficiency transaction needs will result in customer commitment to the relationship, a lengthening of purchasing duration, increases in the frequency of purchasing, and the generation of cross-buying. The hypothesis is as follows:

H4. Customer perceived relationship investment has positive effects on: (a) relationship length; (b) relationship depth; and (c) relationship breadth with regard to SST used in retailing.

The moderating effect between dedication-based relationship maintenance and perceived relationship investment

Businesses want to obtain the greatest market share in the technology growth market. The spreading of technology will elaborate user orientation toward having an efficient way to complete tasks and will also help these businesses obtain a higher market share (Zhu *et al.*, 2007). However, some people still resist using technology (Celik and Yesilyurt, 2013). These users fear computers because they think computer use causes them to exhibit a lack of self-efficacy, among other weaknesses (Cambre and Cook, 1985; Compeau and Higgins, 1995; Gripenberg, 2011; Hackbarth *et al.*, 2003). Hence, computer anxiety usually plays a potential role in some customer cognitions related to the technology of shopping (Cambre and Cook, 1985). Accordingly, computer anxiety is defined as the fear and apprehension people feel when thinking about or actually using computers (Cambre and Cook, 1985; Kim and Forsythe, 2008).

Previous studies have focussed on providing a quality function platform as a determination to impact continuous use of technology (Elie-dit-cosaque *et al.*, 2011). In other words, technology system structures should create functionality for users,

especially in the case of SSTs (Delone and Mclean, 2004). Accordingly, a quality service perception will be established on in customers who have lower levels of computer anxiety (Hackbarth *et al.*, 2003). SET has pointed out that customer perception of benefits is a determinant of their future behavior (Blau, 1964; Kim and Son, 2009). In the current study, it is posited that users with computer anxiety who perceive information technology to provide a beneficial platform will think that information technology is investing resources intended to keep them loyal with regard to their use of the platform.

E-environments area now wide spread. Technology usually makes things more efficient. Hence, businesses launching technology-related business operations not only are effective but also evoke customer usability perceptions (Collier and Sherrell, 2010; Delone and Mclean, 2004). However, some people are afraid to use computers due to computer anxiety (Cambre and Cook, 1985). Hence, this study argues that the success of retailers launching dedication-based relationship maintenance mechanisms depends on whether customers have low levels of computer anxiety, which will evoke the customer relationship investment perception. Consequently, once customers have lower levels of computer anxiety, and retailers have a variety of products/services as a driver, this will evoke perceptions that the retailer is making marketing efforts toward relationship building through the provision of a variety of products/services.

Also, Kim and Forsythe (2008) specified that computer anxiety plays a moderating role in regard to the use of technology products. Customers with lower computer anxiety will have positive perceptions of the information system (Elie-dit-cosaque *et al.*, 2011). In other words, once customers have lower anxiety toward computers, systems have usefulness characteristics that will evoke positive perceptions of business efforts to build relationships (Crosby *et al.*, 1990; Delone and Mclean, 2004). Hence, once a user with lower computer anxiety perceives positive quality in an e-service, this will impact the businesses' continual investment in resources related to relationship building (Crosby *et al.*, 1990). This study argues that computer anxiety plays a moderating role between e-service quality and perceived relationship investment.

Finally, retailers usually launch SST to fulfill customer needs for innovation, such as when they launch in-store kiosks in convenience store (Chiu *et al.*, 2010). The novelty experience related to manipulating SST will evoke customer beliefs that the retailer has invested resources in relationship building. Wells *et al.* (2010) pointed out that information technology delivers a novel experience to users and suggested that positive attitudes toward information technology will be generated as a result. In fact, a novel shopping experience will lead customers to have benefit perceptions of an e-business (Rogers, 1985; Wells *et al.*, 2010). It has been argued that benefit perceptions are generated when customers have low anxiety toward information technology (Elie-dit-cosaque *et al.*, 2011). Hence, this study argues that customers with low-computer anxiety will, based on their novel perception via SST use experience, perceive a positive relationship investment on the part of the SST retail operation. The hypothesis is as follows:

- H5. Computer anxiety moderates the influence of customer: (a) perceived complementarity; (b) perceived e-service quality; and (c) perceived novelty on perceived relationship investment.

The moderating effect between perceived relationship investment and relationship performance

Some people are concerned about time as a resource. They believe that the efficient use of time will lead to an effective life (Kleijnen *et al.*, 2007). Hence, time consciousness is

defined as a person's predisposition to consider time as a scarce resource and to plan its use carefully.

Customers are concerned about efficiency and time savings during SST use (Collier and Sherrell, 2010). The characteristics of SST are related to customer independence and the completion of transactions. Particularly, customers with time consciousness usually think efficient purchasing transactions are one of the most important factors related to their shopping procedures (Kleijnen *et al.*, 2007). Hence, the main purpose of SST in retailing is fulfilling customers' needs for efficient e-shopping (Zhu *et al.*, 2007).

This study proposes that customers with higher time consciousness perceive that convenience stores utilize their resources to build relationship, such as care about efficient shopping need. In other words, relationship investment is a strategy to create relationship performance. Hence, this will lead them to be loyal to the retail SST in the future. The hypothesis is proposed:

- H6. Time consciousness moderates the influence of customer's perceived relationship investment on: (a) relationship length; (b) relationship depth; and (c) relationship breadth.

Method and results

Pilot test

This study discusses the operation of in-store kiosks in convenience stores as a means to understand SST in the retail context. The definitions of the construct are provided in Appendix 1. Further, a seven-point Likert response scale format that ranged from "strongly agree" to "strongly disagree" was used in the questionnaire in this study. All the construct measurements were modified from previous studies and were consistent with their definitions (see Appendix 2). The construct of perceived complimentary was modified from the questionnaire of Zhou and Lu (2011). Measuring e-service quality was in accordance with the research of Lin and Hsieh (2011). SST provided novel product/service which can evoke customer novelty perception measurement according to the study of Wells *et al.* (2010). Perceived investment measurement was modified from the questionnaire of De Wulf *et al.* (2001). The measurement of customer time consciousness was modified from the study of Kleijnen *et al.* (2007). Computer anxiety measurement was modified from the research of Cambre and Cook (1985) and Kim and Forsythe (2008). Finally, the measurement of relationship performance was modified from the questionnaire of Bolton *et al.* (2004) and Liang and Chen (2009).

All items in the questionnaire are reflective. According to the central limit theory, which emphasized that the sample sizes over 30, the sampling frame was similar to that of a normal distribution (Weise, 1975). Hence, we invited 31 respondents who had experience with using in-store kiosks in convenience stores to fill out the paper questionnaires, and we used SPSS 17.0 to analyze the data. Cronbach's α and the item-to-total correlation were brought in as the standard items of choice for the main study (Weise, 1975). According to Weise (1975), a level of 0.3 is acceptable for the questionnaire in this study. In the case of the other 67 items, the item-to-total value exceeded 0.3. Therefore, the general requirement of reliability for the research instruments was satisfied. As a result, all 67 items were adopted. Therefore, there were a total of 67 items used together in the formal questionnaire to measure all the constructs.

Sample

This study examines the use experience related to in-store kiosks in respect to experience with retail SST. A field survey conducted in an in-store kiosk about use experience provided the empirical data: an on-line survey (www.my3q.com/) was published on a bulletin board system (BBS), which yielded 246 usable responses. Further, Wilfong (2006) argued that computer experience is unrelated to computer anxiety. Indeed, some people are forced to use computers in during work or life (Reinders *et al.*, 2008), for example, when students convey the latest school information on the BBS or when public servants use computers to manage their work instead of employing paper work. Users who have computer anxiety are forced to use computers to get information. Accordingly, this study argues that users who have computer anxiety are not limited with regard to use experience, and therefore focusses on people who are anxious about using a computer. Hence, this study argues that online surveys can express the opinions of users who have experience in using in-store kiosks for shopping in a convenience store, especially those who have computer anxiety.

Further, at the beginning of the questionnaire, we asked the respondents "Have you ever had a shopping experience with an in-store kiosk in a convenience store?" An answer of "Yes" for this question meant that the questionnaire could be followed up on. This procedure ensured that only experienced respondents were invited to complete the questionnaire.

Totally, 35 questionnaires were eliminated in which the respondents filled in some questions incompletely. Finally, the study had 211 respondents that could be used for analysis. Sample demographics are depicted in Table I. In total, 47.90 percent of the respondents were male, and 52.10 percent were female. The majority of respondents (36.00 percent) were 21-24 years old and 25-29 years old (34.60 percent). The educational levels of respondents indicated that 58.30 percent had a university degree. About 44.50 percent of the respondents had lower than US\$500 disposable income per month at the time of the study. The majority of the respondents were students (42.20 percent),

Measure	Items	Frequency (%)	Measure	Items	Frequency (%)
Gender	Male	101 (47.90)	Age	Under 20	9 (4.3)
	Female	110 (52.10)		21-24	76 (36.0)
Education	Under high school	1 (5.00)	25-29	73 (34.6)	
	High school	5 (2.40)	30-34	45 (24.3)	
	University	123 (58.30)	35-39	4 (1.9)	
	Graduate school	82 (38.90)	> 40	4 (1.9)	
Disposable income (US \$/per month)	Lower than 500	94 (44.50)	Occupation	Public sector	32 (15.20)
	501-1,000	27 (12.80)		Private sector	78 (37.00)
	1,001-2,000	42 (19.91)		Housewife	4 (1.90)
	2,001-2,500	28 (13.30)		Student	89 (42.20)
	> 2,501	20 (9.50)	Others	8 (3.80)	
How many times do you usually shop using an in-store kiosk? (per week)	< 1	109 (51.70)	In which in-store kiosk in a convenience store do you usually purchase?	i-bon (7-11)	191 (90.50)
	2	65 (30.80)		Famiport	15 (7.10)
	3	23 (10.90)		(FamilyMart)	
	4	8 (3.79)		LifeET (HiLife)	5 (2.40)
	> 5	6 (2.84)			

Table I.
Sample demographic **Note:** $n = 211$

and the remainders work in the private sector (37.00 percent). Indeed, most of respondents were students. Student have higher ability to use information technology due to their education (Ozok and Wei, 2010), but some students still have computer anxiety. They think that a service encounter is necessary when shopping in order to make a product evaluation. Hence, the student respondents provide our results. The majority of respondents use kiosks in convenience stores (per week) less than 1 time per week (51.70 percent). Finally, most of the respondents use i-bon kiosk (7-11) (90.5 percent).

Common method variance (CMV) usually exists in information technology survey research. Hence, this study employed a Harman's one factor test for CMV (Podsakoff *et al.*, 2003). We used an un-rotated principle components factor analysis in which all of the measurement items were combined into a single factor. All measurements were generated with eigenvalues greater than 1. The results showed a 68.34 percent total variance; factor one accounted for 17.49 percent of the variance. Thus, this study is unlikely have concerns with CMV.

Validity and reliability of the measurement

As Table II shows, all of the reliability estimates were higher than 0.8, providing evidence for a high degree of internal consistency among the corresponding indicators. According to Bagozzi and Yi (1988), AVE values greater than 0.5 are considered adequate. Table III shows the square root of the AVE for each construct in the diagonal. Below the diagonal is the correlation of each construct. All the square roots of the AVE were greater than the correlation between the two constructs of interest, indicating that the discriminate validity of the measurement model was satisfied. In addition, the result of the CR was similar to the result of the AVE. The constructs had values above the recommended value (ranging from 0.64 to 0.82). Therefore, the dimension of convenience in the e-service quality construct did not present good validity in the second order confirmatory factor analysis. This study suggested that the "convenience" dimension of e-service quality usually is generated from the convenience store itself rather than from an in-store kiosk. Hence, this study deleted the dimension of convenience in the e-service quality construct. Consequently, e-service quality presented good validity and reliability. Meanwhile, we deleted factor loadings lower than 0.7 (RB1, RL3, TC3, TC9, and CA2). Finally, all constructs presented good validity and reliability.

The χ^2 was significant ($p < 0.001$), and $\chi^2/df = 2.25$, proving internal consistency between the observations and the theoretical model. The CFI = 0.93, the GFI = 0.82, and the RMSEA = 0.08, achieved the recommended standard. The other indices, NFI = 0.88, and the AGFI = 0.78, which were slightly lower or higher than the recommended values, but all fell within an acceptable range. The above indices proved the research model fit the sample data well.

Hypothesis testing

SEM analysis. AMOS 7.0 was used in this study for SEM analysis, including standardized path coefficients, path significances for each variable and model fit indices, and the results are presented in Figure 2 and Table IV. It can be seen that there are six paths in this model significant at $p < 0.001^{***}$ and one significant at $p < 0.05^{**}$. Customer perceptions of complementarity between in-store kiosk and variety products/services had a significant effect on perceived relationship investment ($\gamma = 0.15^{***}$;

Constructs/items	Factor loading	Item-to-total	α	CR	AVE
<i>Perceived complementarity</i>					
PC1	0.88***	0.82	0.90	0.97	0.75
PC2	0.89***	0.81			
PC3	0.83***	0.78			
<i>E-service quality</i>					
FN	0.83***	0.79	0.92	0.82	0.66
EJ	0.80***	0.75			
SC	0.79***	0.79			
AS	0.79***	0.76			
DS	0.82***	0.79			
CU	0.84***	0.78			
<i>Perceived novelty</i>					
PN1	0.85***	0.71	0.92	0.96	0.72
PN2	0.89***	0.78			
PN3	0.80***	0.65			
<i>Perceived relationship investment</i>					
PI1	0.90***	0.70	0.89	0.87	0.67
PI2	0.83***	0.80			
PI3	0.78***	0.71			
PI4	0.79***	0.75			
PI5	0.80***	0.72			
<i>Time consciousness</i>					
TC5	0.64***	0.64	0.87	0.84	0.64
TC6	0.93***	0.82			
TC7	0.91***	0.80			
TC8	0.66***	0.68			
<i>Computer anxiety</i>					
CA1	0.70***	0.70	0.88	0.93	0.71
CA3	0.84***	0.81			
CA4	0.97***	0.81			
<i>Relationship performance</i>					
Relationship length			0.85	0.86	0.81
RL1	0.90***	0.75			
RL2	0.83***	0.75	0.90	0.90	0.74
Relationship depth					
RD1	0.89***	0.80			
RD2	0.87***	0.81			
RD3	0.82***	0.77	0.93	0.93	0.82
Relationship breadth					
RB2	0.88***	0.85			
RB3	0.93***	0.88			
RB4	0.91***	0.86			

Table II.
Confirmatory factor
analysis

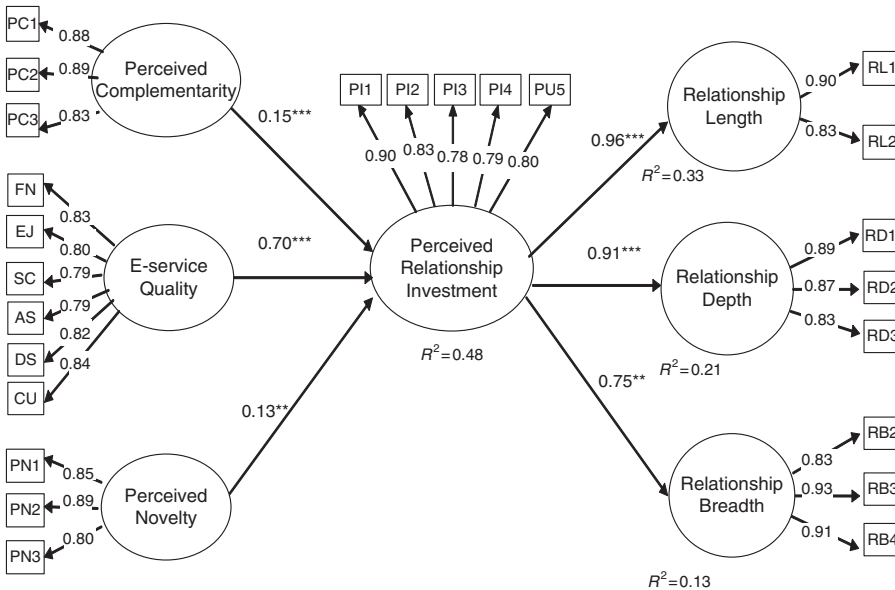
Note: *** $p < 0.001$

$t = 2.85$); e-service quality had a significant effect on perceived relationship investment ($\gamma = 0.70^{***}$; $t = 7.07$), and perceived novelty had a significant effect on perceived relationship investment ($\gamma = 0.13^{**}$; $t = 2.41$), thereby supporting $H1$, $H2$, and $H3$. Perceived relationship investment had a significant effect on relationship length

Constructs	PC	SQ	PN	PI	TC	CA	RL	RD	RB
PC	0.87 ^a								
SQ	0.55**	0.81 ^a							
PN	0.52**	0.76**	0.85 ^a						
PI	0.56**	0.76**	0.71**	0.82 ^a					
TC	0.29**	0.46**	0.28**	0.37**	0.80 ^a				
CA	-0.26**	0.02**	0.02**	-0.08**	0.04**	0.84 ^a			
RL	0.30**	0.60**	0.51**	0.49**	0.43**	0.17**	0.90 ^a		
RD	0.06**	0.49**	0.35**	0.30**	0.32**	0.38**	0.69**	0.86 ^a	
RB	0.45**	0.76**	0.63**	0.67**	0.38**	0.06**	0.64**	0.53**	0.91 ^a

Notes: PC, Perceived complementarity; SQ, e-service quality; PN, perceived novelty; TC, time consciousness; CA, computer anxiety; RL, relationship length; RD, relationship Depth; RB, relationship breadth.
^aSquare root of average variance extracted (AVE). **Correlation is significant at the 0.01 level (two-tailed)

Table III. Discriminate validity



Notes: $\chi^2=679.22$; $\chi^2/df=2.25$; CFI=0.92; GFI=0.80; AGFI=0.75; NFI=0.88; RMSEA=0.08. *** $p < 0.001$; ** $p < 0.05$

Figure 2. Results of structural equation modeling

Hypothesized relationship	β	t-value	Conclusion
H1: Perceived complementarity → Perceived relationship investment	0.15***	2.85	Supported
H2: E-service quality → Perceived relationship investment	0.70***	7.07	Supported
H3: Perceived novelty → Perceived relationship investment	0.13**	2.41	Supported
H4a: Perceived relationship investment → Relationship length	0.96***	8.82	Supported
H4b: Perceived relationship investment → Relationship depth	0.91***	5.90	Supported
H4c: Perceived relationship investment → Relationship breadth	0.75***	4.99	Supported

Notes: Fit index: $\chi^2=679.22$; $\chi^2/df=2.25$; CFI=0.92; GFI=0.80; AGFI=0.75; NFI=0.88; RMSEA=0.08. *** $p < 0.001$; ** $p < 0.01$

Table IV. The results of the structural equation model

($\gamma = 0.96^{***}$; $t = 8.22$). Perceived relationship investment had a significant effect on relationship depth ($\gamma = 0.91^{***}$; $t = 5.90$); perceived relationship investment had a significant effect on relationship breadth ($\gamma = 0.75^{***}$; $t = 4.99$); thereby, *H4a*, *H4b*, and *H4c* were supported.

In fact, every in-store kiosk in a convenience store provides merchandise variety that builds complementarity characteristics between the in-store kiosk and its products/services; the strategy is intended to create loyal customers. For example, a concert ticket that was purchased through an in-store kiosk can be accepted by the organizer, customers thus can make an efficient purchase without finding the specific ticket sales point. Accordingly, this study suggests that customer perceptions of complementarity between in-store kiosks and the variety of products/services will cause them to commit to a future relationship with an in-store kiosk in a convenience store.

We further conducted a test for the direct effect between customer-perceived complementarity and relationship performance. The results shows that perceived complementarity did not have a significant impact on either relationship length ($\gamma = -0.22$; $t = -1.87$) or relationship breadth ($\gamma = -0.10$; $t = -1.80$). However, perceived complimentary had a negatively significant impact on relationship depth ($\gamma = -0.26^{**}$; $t = -2.27$). As a result, perceived complementarity has not a significant impact on relationship length and breadth, but it has a negatively significant impact on relationship depth.

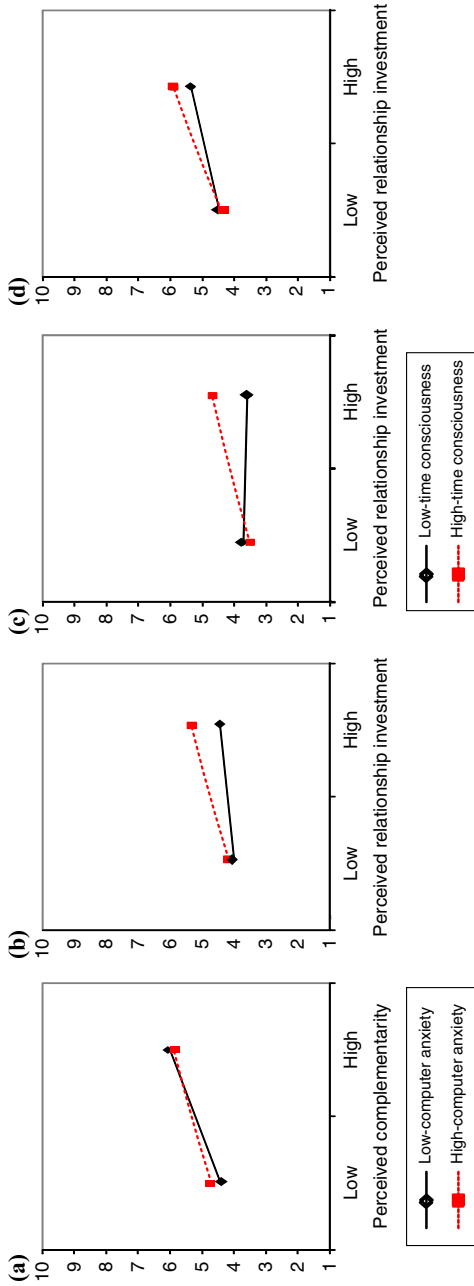
Moderating analyses. Using covariance-based SEM to estimate the latent interaction effects may yield parameter estimation biases and difficulties (Moosbrugger *et al.*, 1997; Kenny and Judd, 1984; Ping, 1996), and thus this study followed previous works (e.g. Hsu and Pereira, 2008; Ahmad *et al.*, 2011; Valle and Witt, 2001) by adopting regression analyses to examine the moderating effect of computer anxiety on the relationship between the independent variables (i.e. perceived complementarity, e-service quality, and perceived novelty) and dependent variable (perceived relationship investment). SPSS 22 was employed by using the Anderson-Rubin method to compute factor scores in the regression analyses (Anderson and Rubin, 1956). Mean-centering was then used in the moderating regression to plot the interaction effects (Dawson, 2014; Poon and Danoff-Burg, 2011; Kuo, 2012). Table V shows that the interaction between perceived complementarity and computer anxiety significantly impacts perceived relationship investment ($\gamma = -0.10^{***}$; $t = -2.22$), whereas the level of computer anxiety did not moderate the relationship between e-service quality and perceived relationship investment ($\gamma = -0.01$; $t = 0.76$), or the relationship between perceived novelty and perceived relationship investment ($\gamma = -0.01$; $t = -0.57$). Therefore, *H5a* was supported, but *H5b* and *H5c* were not. Again, regression analyses were employed to test whether time consciousness has a moderating effect on the relationships between perceived relationship investment and relationship length, depth, and breadth. According to Table VI, the degree of time consciousness moderates the influence of perceived relationship investment on relationship length ($\gamma = 0.19^{***}$; $t = 2.93$), relationship depth ($\gamma = 0.44^{***}$; $t = 5.50$), and relationship breadth ($\gamma = 0.13^{***}$; $t = 2.87$), and thus *H6a*, *H6b*, and *H6c* were supported.

Furthermore, we conducted simple slope analyses for the significant interactions (Dawson, 2014; Poon and Danoff-Burg, 2011; Kuo, 2012). As shown in Figure 3, each plotted graph reveals a crossed interaction and confirms that the interaction effects (*H5a*, *H6a*, *H6b*, and *H6c*) are statistically significant. The plotted graph of Figure 3(a) shows that the slope between perceived relationship investment and perceived

Table VI.
Regression between
perceived
relationship
investment and
relationship
performance (time
consciousness)

	Dependent variable: relationship length			Dependent variable: relationship depth			Dependent variable: relationship breadth												
	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 3 β										
<i>Independent variables</i>																			
PRI	0.61***	8.12	0.47***	6.16	0.49***	4.40	0.48***	4.54	0.34***	6.16	0.36***	3.46	0.77***	12.90	0.70***	11.11	0.71***	11.42	
TC				0.30***	4.64	0.28***	6.39	0.34**	4.64	0.28***	3.21				0.15**	2.83	0.13***	2.56	
<i>Interaction</i>																			
PRI \times TC							0.19***					0.44***					0.13***		2.87
R^2	0.24		0.31		0.34		0.09		0.14		0.25		0.44		0.46		0.48		0.48
Adjusted R^2	0.24		0.30		0.33		0.09		0.13		0.24		0.44		0.46		0.48		0.48
ΔR^2	0.24		0.07		0.03		0.09		0.05		0.11		0.44		0.02		0.02		0.02
VIF	1.00		(1.16~1.16)		(1.01~1.18)		1.00		(1.16~1.16)		(1.01~1.18)		1.00		(1.16~1.16)		(1.01~1.18)		(1.01~1.18)

Notes: PRI, perceived relationship investment; TC, time consciousness. *** $p < 0.001$; ** $p < 0.05$



Notes: (a) Perceived relationship investment; (b) relationship length; (c) relationship depth; (d) relationship breadth

Figure 3.
Computer anxiety
and time
consciousness:
simple slope
analyses for
significant
interactions

complementarity decreases for higher levels of computer anxiety. That is, consumers with high-computer anxiety perceive lower relationship investment from the convenience store when perceived complementarity is high rather than low. In Figure 3(b)-(d), the slopes between relationship length/depth/breadth and perceived relationship investment increase for higher time consciousness, while the slopes between relationship depth and perceived relationship investment decrease for lower time consciousness. Restated, consumers with high-time consciousness perceive higher relationship length, depth, and breadth when they perceive high-relationship investment from the convenience store.

Conclusions and implications

Discussions

This study employs a utilitarian value of dedication-based relationship maintenance mechanism based on SET. Use in-store kiosks in Taiwanese convenience stores as the means to investigate whether the development of SST in retail environments will be evoked to improve business relationship performance.

We found that in-store kiosks provide merchandise variety and exhibit complementarity that will evoke the customer perceptions that the convenience store is investing resources in relationship development. In other words, in-store kiosks that fulfill customers' need to easily find products/services will help the businesses build their customer relationships as a result of positive perceptions on the part of the customers. Meanwhile, good e-service quality in in-store kiosks also relates to customer perceptions that the company is investing resources in maintaining customer loyalty intentions. Also, novel in-store kiosk experiences will determine customer perceptions of the convenience store related to their belief that the store is making an effort to maintain relationships. Consequently, *H1*, *H2*, *H3* were supported.

Therefore, we found that customer perceived complementarity as related to a dedication-based relationship maintenance mechanism is not only unrelated to relationship length and breadth but also exhibits a negatively significant impact on relationship depth. Kotler and Keller (2013) suggested that businesses using product-oriented strategies have not been fulfilling customer purchasing needs. In other words, businesses launching product-oriented strategies will fail because such businesses are launching a variety of products/services without matching this process to their relationship marketing strategies. Indeed, marketing myopia will occur in businesses launching product-oriented strategies (Levitt, 1975). Product-oriented strategies are not only unrelated to relationship performance but also result in the loss of customers. Hence, convenience stores managing in-store kiosks should make an effort to complement their relationship marketing strategic slotting strategy in in-store kiosk business operations.

This study found that customers perceiving an effort on the part of a store to maintain their loyalty intention will determine their purchase retention and frequency of purchase as well as their cross-buying behavior in specific in-store kiosks. *H4a*, *H4b*, *H4c* were thus supported.

It was also determined that the level of computer anxiety significantly influences the relationship between perceived complementarity and perceived relationship investment, and thus *H5a* was supported. For a high level of computer anxiety, the positive impact of perceived complementarity on relationship investment is reduced. Customers with computer anxiety may refuse to use a computer-related channel. Even if the convenience stores offer merchandise variety in their in-store kiosks, customers

with computer anxiety view this as forced use (Reinders *et al.*, 2008), and pressure will be generated. Hence, customers with computer anxiety who must make a purchase by using a computer may have a worse perception of the in-store kiosk shopping experience, regardless of the convenience store's relationship building strategy. Meanwhile, customers who think that they need to purchase a specific product that requires using an in-store kiosk channel without other channel selection choices will cause an anchor effect (Tversky and Kahneman, 1974). Even if the convenience store makes an effort to provide good quality in-store kiosk services or novel purchasing experiences as relationship maintenance mechanisms, the customers will find using the in-store kiosk to be a kind of anxiety-inducing experience. Therefore, *H5b* and *H5c* were not supported. Consequently, in-store kiosks providing merchandise variety will impact customer relationship investment, only when customers have a low level of computer anxiety.

In fact, the starting point of in-store kiosk design is the provision of efficient purchasing (Chiu *et al.*, 2010). Hence, efficient purchasing is an appropriate strategy for customers who view time as a resource. Indeed, this study found that convenience stores developing in-store kiosk businesses are making an effort to care about efficient shopping in order to maintain loyal customers. These businesses usually solicit customers who have time consciousness. Ultimately, relationship performance will go along with this effort. Hence, *H6a*, *H6b*, *H6c* were supported.

Theoretical implications

Blau (1964) argued that businesses that provide benefits to customers will determine the future behavior of these customers. Further, Kim and Son (2009) argued that when online businesses launch dedication-based relationship mechanisms, this will directly impact online user loyalty. Therefore, this study found that retailers launching SST employing dedication-based relationship mechanisms in utilitarian value did not all affect customer commitment to the relationship. Accordingly, a dedication-based relationship maintenance mechanism, especially customer perceptions that in-store kiosks offer utilitarian value, should tie into the business relationship building effort. In other words, retailers launching SST should not only provide benefits to customers but also should make an effort to evoke customer perceptions that they are investing their resources to maintain customer loyalty. Relationship performance related to loyalty will in turn, be a result.

This study found that high-computer anxiety plays a negative moderating role between perceived complementarity of dedication-based relationship maintenance mechanisms and customer perceived relationship investments. Therefore, the anchoring effect from customers who have computer anxiety will serve as a notice for retailers willing to launch physical e-businesses in situations with only SST transaction options (Tversky and Kahneman, 1974). Hence, the dedication-based relationship maintenance mechanism has limitations that are a result of computer anxiety on the part of customers.

Finally, De Wulf *et al.* (2001) found that businesses who focus relationship investment in relationship building will determine customer loyalty. In fact, this study found that time consciousness acts as a moderator between relationships. Hence, customers who think of time as a resource escalate the effect between their perceptions that a business has invested effort in relationship building and the development of customer loyalty.

Managerial implications

We found that retailer launches of SST determine customer perceptions of relationship investment. Hence, retailers who are willing to continually launch SSTs in retail environments should tie this in with their relationship marketing strategies. Indeed, provision of merchandise variety, quality service, and novel purchasing experiences to customers should be based on relationship marketing strategy. This will help the retail SST attract more loyal customers. Meanwhile, the business will earn long-term relationship benefits through relationship building strategies.

Further, this study found that customers with computer anxiety have an anchor related to the use of technology. Hence, this study suggests that retailers who are willing to launch e-businesses should establish strategies such as providing instructional guides on the interface designed to escalate customer experience in regard to the use of technology (Kim and Forsythe, 2008). Consequently, the habit of using technology will be gradually generated (Venkatesh *et al.*, 2013). This strategy will increase the population of users who have computer anxiety. Finally, it will help e-businesses to become smoothly set into action in the future.

Finally, those who launch retail SSTs should care about functional relationship marketing strategies, such as efficient transaction. This will evoke customer relationship investment perception to build relationship performance with customers, especially the customers with time consciousness.

Limitations and future research

First, this study did not consider different kinds of products/services to have different involvement in regard to customer cognition (Gutierrez *et al.*, 2010). Considering different kinds of customer involvement with products/services might lead to different kinds of impacts derived from customer perceptions of the efficacy of SST in retail environments. Second, most of our respondents were students. Student samples still have research limitations related to business research (Ozok and Wei, 2010), such as low income and higher information technology ability as compared to those in other occupations. This study thus suggests that future researchers may wish to collect a sample with a wider age range in order to obtain more robust results. Third, while convenience stores are almost everywhere in Taiwan, in-store kiosks are only used by the top three convenience store chains. Since these stores are very easy to find, it is difficult to distinguish whether the level of perceived convenience is due to the convenience stores *per se* or the in-store kiosks that they have. Future research may thus consider analyzing in more detail how perceived convenience is evoked. Finally, since many studies have confirmed that SSTs can support constraint-based relationships (e.g. De Wulf *et al.*, 2001; Kim and Son, 2009; Liu, 2012), this study mainly focussed on the relationship between the dedication-based relationship mechanism and customer perceived relationship investment. Future studies may consider using both dedication- and constraint-based relationship mechanisms to find out which is the most influential in an SST business setting, and thus more comprehensive results with regard to the SET construct of relationship maintenance can be obtained (Kim and Son, 2009).

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Appendix 1

SST
relationship
performance

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Constructs	Definitions	Reference
Dedication-based relationship maintenance	Attitudinal commitment resulting from genuine appreciation for the relationship, such as utilitarian value	Kim and Son (2009)
Utilitarian value	An in-store kiosk for a convenience store that focusses on the utilitarian value of in-store kiosk system design will provide functional information technology for businesses that will attract the customers' genuine appreciation of the relationship; it includes perceived complementarity, e-service quality, and perceived novelty	Delone and McLean (2004), Kim <i>et al.</i> (2012) and Zhou <i>et al.</i> (2012)
Perceived complementarity	Retailers launching SST represent complementarity features, such as ticket purchasing, paying bills, and copy machines, that compliment in-store kiosk businesses' ability to generate customer benefit perceptions	Oliver (1999), Zhang <i>et al.</i> (2008) and Zhou and Lu (2011)
E-service quality	Customer perception of SST service quality delivery in a retail environment	Lin and Hsieh (2011)
Perceived novelty	Perceived novelty is defined as when novelty products/services deliver a novel shopping experience	Wells <i>et al.</i> (2010)
Perceived relationship investment	Customer perceptions that a retailer has invested resources in long-term relationship building through the use of SST in retailing operations	De Wulf <i>et al.</i> (2001)
Time consciousness	A person's predisposition to consider time as a scarce resource and to plan its use carefully	Kleijnen <i>et al.</i> (2007)
Computer anxiety	The fear and apprehension people feel when thinking about or actually use computers	Cambre and Cook (1985) and Kim and Forsythe (2008)
Relationship performance	Customer's future purchasing behavior. In fact, the length, breadth, and depth of customer purchasing behavior is a measurement of customer loyalty behavior	Bolton <i>et al.</i> (2004) and Liang and Chen (2009)
Relationship length	Relationship length is defined as the duration of willingness of a customer to transact with a specific retail SST in the future	Bolton <i>et al.</i> (2004) and Liang and Chen (2009)
Relationship depth	Customer willingness to frequently transact with a specific retail SST in the future	Bolton <i>et al.</i> (2004) and Liang and Chen (2009)
Relationship breadth	Customer's intention to conduct cross-buying behavior with a specific retail SST in the future	Bolton <i>et al.</i> (2004) and Liang and Chen (2009)

Table AI.
Construct definitions

Perceived complementarity (PC) (Zhou and Lu, 2011)

- PC1 A wide range of products/services are provided in the in-store kiosk in the convenience store that I usually use
- PC2 The in-store kiosk in the convenience store that I usually use provides complimentary products/service (e.g. a ticket purchased through the in-store kiosk is accepted by the organizer)
- PC3 A wide range of businesses are launching in-store kiosks in convenience stores

E-service quality (Lin and Hsieh, 2011)

Functionality (FN)

- FN1 I can get my service done with the in-store kiosk in the convenience store that I usually use in a short time
- FN2 I can get my service done smoothly with the in-store kiosk in the convenience store that I usually use
- FN3 Using the in-store kiosk in the convenience store that I usually use, I can complete my purchasing task in time
- FN4 The service process of the in-store kiosk in the convenience store that I usually use is clear
- FN5 The manipulating of the in-store kiosk in the convenience store is easy to understand
- FN6 Using the in-store kiosk in the convenience store that I usually use, I can smoothly complete my purchase task
- FN7 Each service item/function of the in-store kiosk in the convenience store that I usually use is error-free
- FN8 The in-store kiosk in the convenience store that I usually use performs correctly the first time
- FN9 The in-store kiosk in the convenience store that I usually use has a clear and easy to follow operational flow among the functions

Enjoyment (EJ)

- EJ1 The operation of the in-store kiosk in the convenience store that I usually use is interesting
- EJ2 I feel good being able to use the in-store kiosk in the convenience store that I usually use
- EJ3 The in-store kiosk in the convenience store that I usually use has interesting additional functions

Security(SC)

- SC1 My personal information is treated confidentially
- SC2 I feel secure supplying relevant information when using the in-store kiosk in the convenience store that I usually use
- SC3 I feel safe in regard to my transactions with the in-store kiosk in the convenience store that I usually use
- SC4 A clear privacy policy is stated when I use the in-store kiosk in the convenience store that I usually use
- SC5 The in-store kiosk in the convenience store that I usually use provides a safe transaction experience
- SC6 The in-store kiosk in the convenience store that I usually use has an integrity privacy-protected mechanism

Assurance (AS)

- AS1 The in-store kiosk in the convenience store that I usually use is well-known
- AS2 The in-store kiosk in the convenience store that I usually use has a good reputation

Design (DS)

- DS1 The layout of the in-store kiosk in the convenience store that I usually use is aesthetically appealing
- DS2 The in-store kiosk in the convenience store that I usually use appears to use up-to-date technology

Customization (CU)

- CU1 The in-store kiosk in the convenience store that I usually use addresses my specific needs
- CU2 The in-store kiosk in the convenience store that I usually use has my best interests at heart

Table AII.
List of measurement
items

(continued)

CU3 The in-store kiosk in the convenience store that I usually use has features that are personalized for me (e.g. selling registered airline tickets)

Perceived novelty (PN) (Wells *et al.*, 2010)

PN1 I found using the in-store kiosk in the convenience store that I usually use to be a novel experience (e.g. providing laundry service)

PN2 Using the in-store kiosk in the convenience store that I usually use is new and refreshing

PN3 The in-store kiosk in the convenience store that I usually use represents a cool and novel way of making purchases

Perceived relationship investment (PI) (De Wulf *et al.*, 2001)

PI1 The convenience store providing the in-store kiosk that I usually use makes efforts to increase regular customers' loyalty

PI2 The convenience store providing the in-store kiosk that I usually use makes various efforts to improve its ties with regular customers

PI3 The convenience store providing the in-store kiosk that I usually use really cares about keeping regular customers

PI4 I believe the convenience store providing the in-store kiosk that I usually use really puts some effort into maintaining a relationship with me

PI5 I believe the convenience store providing the in-store kiosk that I usually use cares about satisfying my needs

Time consciousness (TC) (Kleijnen *et al.*, 2007)

TC5 I like to make to-do lists to help sequence my activities

TC6 I usually have a time schedule for everything

TC7 I prefer to be able to plan in advance what tasks I need to do

TC8 I often combine tasks to optimally use my time

Computer anxiety (CA) (Cambre and Cook, 1985; Kim and Forsythe, 2008)

CA1 I feel apprehensive about using computers

CA3 I hesitate to use a computer for fear of making mistakes that I cannot correct

CA4 Computers are somewhat intimidating to me

Relationship performance (Bolton *et al.*, 2004; Liang and Chen, 2009)

Relationship Length (RL)

RL1 I will continue to be a loyal customer of the in-store kiosk in the convenience store that I usually use

RL2 I consider the in-store kiosk in the convenience store that I usually use to be my first choice to do business with

Relationship Depth (RD)

RD1 I will continue to do business with the in-store kiosk in the convenience store that I usually use even if its prices increase somewhat

RD2 I will not take some of my business to a competitor that offers better prices

RD3 I will not choose another in-store kiosk in the convenience store for purchasing in the future

Relationship Breadth (RB)

RB2 It is convenient to conduct one-stop shopping on the in-store kiosk in the convenience store that I usually use

RB3 The in-store kiosk in the convenience store that I usually use can fulfill all of my various needs in one place

RB4 The in-store kiosk in the convenience store that I usually use can satisfy my need to purchase-related products/services

Table AII.

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