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Factors affecting repatronage intention of cashierless stores in Taiwan

Jui-Chun Chai*

National Taipei University, Taiwan

Hui-Chen Chang**

National Taipei University, Taiwan

Abstract

Due to the rapid advancement of technology, the increasing cost of human resource and the approach of aging society, cashierless stores, which combine artificial intelligence (AI) and Internet of Things (IoT), emerged. After the launching of Amazon Go in 2016, countries around the world followed this trend, for instance Taiwan's X-Store and China's Bingo Box. In addition to reducing labor costs, by setting up cashierless store, companies can increase shopping speed, autonomy, and convenience through self-service technologies (SSTs) and thereby increase customers' shopping experience and loyalty. However, what customers anticipate is the value they perceive. Furthermore, human warmth is one of the important traits that Taiwan people value. Since cashierless stores are unmanned, whether cashierless stores can provide the warmth that is similar to a regular store remains unknown. Thus, this study aims to explore the effect of SSTs service quality, novelty, and social presence on repatronage intention through perceived risk and perceived benefit. This study is based on an online survey of total samples of 231 valid respondents who had experience with convenience store type of cashierless store in Taiwan. Confirmatory factor analysis is adopted to examine the reliability and validity of measurement scales, and structural equation modeling is used to test the hypotheses of this study. The results of this study show that perceived benefit affects repatronage intention positively. SSTs service quality has positive effects on perceived benefit and has negative effects on perceived risk. However, novelty only has positive effects on perceived benefit. Moreover, social presence has negative effects on perceived risk and positive effects on perceived benefit. Practical implications are proposed based on these research results.

Keywords: cashierless store, self-service technologies service quality, novelty, social presence, repatronage intention

* Corresponding author: juchai@syr.edu

** cjenny@gm.ntpu.edu.tw

1. Introduction

With the rapid development of artificial intelligence (AI) and Internet of Things (IoT), the increasing cost of human resource and the approach of aging society, retailers around the world are paying attention to cashierless store. At the end of 2016, Amazon opened their first cashierless store for employee, Amazon Go. In the following year, 7-Eleven in Korea also launched their cashierless store, 7-Eleven Signature. Moreover, China's startup company launched Bingo Box in 2017 as well, a cashierless convenience store chain. Two years after Amazon's launch, Japan's Lawson, Taiwan's 7-Eleven and FamilyMart introduced their own cashierless store. From retailers' point of view, by launching cashierless stores they can achieve cost reductions, efficiency, flexibility, and productivity and improve corporate performance (Bitner et al., 2002; Lee et al., 2009). In addition, retailers believe cashierless stores can increase customers shopping experience. However, from customers' point of view, cashierless store does not necessarily satisfy customer's need (O'Keefe, 2018).

Cashierless stores provide two characteristics to their customers, self-service technologies (SSTs) and novelty. SSTs are the fundamental requirement for cashierless store (Orel and Kara, 2014). These technologies altered not only the way customers interact with retailers but also the way retailers communicate with their customers by allowing customers to create service outcomes without direct involvement of service employee. Novelty is another fundamental characteristic. It is, in fact, a fundamental characteristic of any innovation (Rogers, 1995). As a matter of fact, cashierless stores in Taiwan are still considered as IT innovations since they have opened olny for less than a year. When compared to regular stores, they may be considered to be novel, in other word, new and refreshing. However, when a customer evaluates a product or service, they weigh its perceived value against the asking price (Almquist et al., 2016). To put it another way, customers value their benefit and their cost. Therefore, their perceived benefits and perceived risks will influence their decision of adoption. Given these points, one of our research questions is as follows: how do SSTs service quality and novelty influence perceptions of risk and benefit when considering the repatronage intention of cashierless store?

With the growing popularity of cashierless store around the world, an argument arises: cashierless stores result in a reduction in customer service and the depersonalized atmosphere (Alpert, 2008). Similar to electronic commerce, a notable difference between cashierless stores and regular stores is the decreased presence of human and social element in the cashierless environment (Hassanein and Head, 2007). Regular store shopping experience involves various types of social interaction with humans (Tauber, 1995). On the other hand, cashierless store shopping experience can be seen as lack of human warmth and sociability since it tends to be more automated. Shopping experiences that associate with positive emotions are linked to several important results. For example, increased time spent in the store and increased spending and unplanned purchasing (Jones, 1999). In all honesty, the social aspect of shopping are one of the major contributors to positive emotion (Jones, 1999; McGrath and Otnes, 1995). Since cashierless stores are unmanned, retailers face a challenge in making their cashierless store socially rich. Therefore, another research question emerged: does social presence, which is provided by the technology-based communication channel of cashierless store, influence customers' perceived risk and customers' perceived benefit and further influence customers' repatronage intention? With these research question, our purpose of this study is to explore the relationship between SSTs service quality, novelty, social presence, perceived risk, perceived benefit, and repatronage intention.

2. Literature review and hypotheses

2.1 Self-service technologies service

SSTs are one of the necessary part in cashierless store. It can be defined as technological mediums that allow customers to perform a service independently without direct involvement of service employee (Meuter et al., 2000). In other words, SSTs require customer's active engagement with the technological mediums. Therefore, the delivery of services is different from face-to-face interaction with service employee. The success of services delivery depends on customer's engagement (Orel and Kara, 2014). Hence, the quality of service provided to customers becomes critical. SSTs' service quality is defined as an overall assessment of a particular service company by comparing that company's performance with customer's general expectations of how the industry should do (Parasuraman et al., 1985, 1988).

Many studies provide different scales to measure service quality. Parasuraman et al. (1988) developed a SERVQUAL scale of five dimensions that can be used to measure customer perception of service quality provided by service employee. However, this scale may not be suitable to measure the different aspects of SSTs' service quality. Over the past decades, measures that can evaluate technology based services are also developed. Zeithaml et al. (2002) developed seven dimensions that can be used to measure e-service quality. Barnes and Vidgen (2001) extended the SERVQUAL scale and developed WebQual Index that can be used to measure customer perceptions of website quality. Most of the existing research on the measurement of the SSTs service quality has focused on e-service. However, Lee et al. (2009) adopted Dabholkar et al.'s (2000) scale to measure the service quality of self-service kiosks. In addition to this, Lin and Hsieh (2011) developed a seven dimensions scale specifically for SSTs.

2.2 Perceived risk

Perceived risk is often considered to be a possible negative outcome of using a product or service. Peter and Ryan (1976) defined perceived risk as "the expectation of losses associated with purchase and acts as an inhibitor to purchase behavior." Featherman and Pavlou (2003) defined perceived risk as "the potential loss when pursuit desired outcome while using service", which is adopted in this study.

Perceived risk was identified in two major categories by Cunningham (1967), which were performance and psychosocial. He first divided performance into three parts, which were economic, temporal, and effort and then divided psychosocial into two parts, which were psychological and social. Furthermore, he characterized perceived risk into six dimensions. In addition to these dimensions of risk, Bellman et al. (2009) stated the importance of time consideration. In today's fast paced world, people are very time oriented and they may be concerned about potential risks of wasting time on learning how to use, getting used to, and troubleshooting a new service. These time-conscious people are very likely to avoid the possible loss of time risk. Therefore, they are less likely to adopt new service due the possibility of high switching, setup and maintenance costs. Another dimension of risk is privacy risk. Privacy risk can be considered one of the most important dimensions in regard of cashierless store since it depends on all sorts of technologies, such as mobile payment, face recognition access control system. According to Featherman and Pavlou's (2003) pilot test, people do concern about their private information being misused by the company collecting it or stolen by identity theft. In order to match our scenario, performance risk, time risk, and overall risk are used to measure perceived risk.

In the service quality literature, many studies show that service quality leads to perceived risk. Chen and Dubinsky (2003) stated that as service quality increases, uncertainty associated with product or service

performance will decrease. In addition to this, Sweeney et al. (1999) found that perceived risk can be reduced by offering quality in a retail environment. Customers who have positive service quality experience are less likely to be disappointed at product or service performance. Therefore, it follows that:

H1: SSTs service quality in cashierless store is negatively related to perceived risk.

2.3 Perceived benefit

Customers very often do not purchase products or services for their own benefit. When they purchase the product, they actually purchase a set of attributes that are valued based on the utility (benefits) provided by the combination of attributes minus the sacrifices (Korda et al., 2004). That is to say, there is a tradeoff between all relevant benefit and costs or scarifies delivered by a product or service and its use. Perceived benefits are a combination of different attributes of products, tangible and intangible, intrinsic and extrinsic, etc. This combination of different attribute is available in relation to a particular buy and use situation (Korda et al., 2004). In addition to this, Chandon et al. (2000) defined that perceived benefit is belief in positive outcome which is related to behavior.

Perceived benefits can be classified into two types: utilitarian and hedonic (Holbrook, 1994). This classification can be applied to shopping since shopping provides utilitarian benefits by assisting customers to find their product efficiently and purchase it, and hedonic benefits by providing entertainment and increasing self-esteem (Babin et al., 1994). In fact, Sheth (1981) assumed that personal determinants of shopping in a physical store can be understood as being influenced by functional (utilitarian) and nonfunctional (hedonic) motive. However, these benefits will not be perceived by customers if SSTs do not provide decent service quality since perceived benefit is a tradeoff between benefit and cost or scarifies.

We assume that customers' perceptions of shopping benefits in terms of convenience, cost reduction, and time saving increase when the SSTs are easy to use, information about products and services can be found easily and quickly, SSTs can load information promptly and correctly, and the check-out processes can be accomplished easily and securely. As Fararah and Al-Swidi (2013) and Akroush et al. (2015) suggested, service quality has a positive effect on the perceived benefits. Therefore, it follows that:

H2: SSTs quality in cashierless store is positively related to perceived benefit.

2.4 Novelty

Tokunaga (2013) explained that novelty "reflects the view of a technology as new, interesting, and identifiably different from others used or understood at the time of the introduction." Novelty is defined as "the degree to which a user perceives an innovation to be a new and exciting alternative to an existing technology" (Wells et al., 2010).

According to Wells et al. (2010), seminal psychology literature claims that the characteristics of novelty stimulate affective reaction. However, it can either be positive or negative. Moreover, researchers also found that novel stimuli will cause strong arousal or emotion, which are highly affective reactions (Clark, 2014; Mandler, 1981). Novel stimuli can create a feeling of unfamiliarity and further inspire interest to the content (Bohme, 1980; Burke and James, 2008). However, as mentioned above, these kind of affective reactions can bring out different emotions, which can range from negative (fear) to positive (interest) (Smith and Ellsworth, 1985). For example, the newness of an innovation may create perceptions of uncertainty which stimulate fears, such as risk that associate with adoption (Swanson and Ramiller, 1997). On the other hand, novelty of

an innovation may also create positive affection such as interest (Mukherjee and Hoyer, 2001) and excitement (Cox and Locander, 1987). Even though novelty may create either positive or negative affective reaction, the word "novelty" is generally associated with positive image (Fichman and Kemerer, 1993). We believe novelty, in this study, will bring positive affective reaction (fresh and exciting) rather than negative (scary and risky).

Novelty can provide an implication on how individuals perceive risk and benefit associated with IT innovation (Wells et al., 2010). A research about RFID technology, which at that time was considered as IT innovation, showed that individuals will often make decision on whether to adopt the technology or reject the technology based on their own risk and benefit equation (Eckfeldt, 2005). Lin and Yu (2006) found that individuals who involve in novelty may "enlarge their perceived usefulness and playfulness (benefit) and underestimate their anxiety (risk)". Novelty, in this study, is considered as an affective belief and individual will rely on emotional or experiential processing when adopting a IT innovation through assessing risk and benefit (Wells et al., 2010). Using affective belief to help and affect decision making process is so called "affect heuristic" (Slovic et al., 2007), and the affect heuristic stated that individuals with positive affective belief will minimize the risks while adopting products or technologies and vice versa (Alhakami and Slovic, 1994). As mentioned before, we believe novelty will bring positive affective belief. Thus, it follows that:

H3: Novelty of cashierless store is negatively related to perceived risk.

H4: Novelty of cashierless store is positively related to perceived benefit.

2.5 Social presence

Since humans usually do treat systems and devices as social beings (Reeves and Nass, 1996), a factor that make humans do this connection seems to be related to presence or more specifically social presence (Heerink et al., 2008). Social presence was introduced by Short et al., (1976) and they defined social presence as the level of a communication medium is perceived to deliver the presence of the communicating participants. Fulk et al., (1987) defined social presence as "the extent to which a medium allows a user to experience others as being psychologically present."

Social presence can be viewed as an essential quality of a communication medium (Lu et al., 2016). On the other hand, social presence is closely related to intimacy and psychological closeness when viewing from a psychological standpoint (Short et al., 1976). With this point of view, social presence is often used to measure perceived warmth, feeling of human contact, etc. that reflect by a medium (Rice and Case, 1983). One stream of researchers view computers/robots as having affective attributes which can replace human interaction by implementing verbal and non-verbal social cues. In other words, it can be related to the feeling of being accompanied by someone (Lombard and Ditton, 1997). In this case, social presence is conceptualized as an overall assessment of the degree of human intimacy in the technology-based communication channel (Rice, 1993). Social presence can sometime be confused with empathy, which is a commonly seen measurement of SSTs service quality. However, there is a distinction between these two. Empathy can be defined as "an ability to identify, understand and react to others' thoughts, feeling, behavior and experiences" (Pilling and Eroglu, 1994). It is more related to understanding. However, as mentioned before, social presence is more related to giving feeling.

Cashierless stores are unmanned, which means they do not facilitate direct interaction with service employee. However, it does not mean that cashierless store cannot deliver social presence. Adding social touch to the interaction can influence customers' perceived social presence. This can be done by welcoming

customers by their names when they enter the store (Gefen and Straub, 2004). Hajli et al. (2017) found that social presence increased intentions to purchase. Moreover, social presence had also been found to influence on perceived usefulness, trust, enjoyment, attitude, and customer loyalty (Cyr et al., 2007; Hassanein and Head, 2007), which is related to perceived risk and perceived benefit (Dongen et al., 2013; Kim et al., 2007). Thus, in this study, we assume that social presence will influence customers' perceived risk and perceived benefit. Therefore, we hypothesize the following:

H5: Social presence in cashierless store is negatively related to perceived risk.

H6: Social presence in cashierless store is positively related to perceived benefit.

2.6 Repatronage intention

Repatronage intention reveals the possibility that a customer will shop at a particular store again and again (Oliver, 1987). Featherman and Pavlou (2003) stated that perceived risk will influence one's adoption decision when results of the decision create (a) feeling of uncertainty, (b) discomfort and/or anxiety, (c) conflict aroused in the consumer, (d) concern, (e) psychological discomfort, (f) making the consumer feel uncertain, (g) pain due to anxiety, and (h) cognitive dissonance. When customers evaluate products or services before purchase and/or adoption, they will perceive risk consciously and unconsciously (Bauer, 1960). There is consumer behavior literature which shows that the risk facets can be used to understand consumers' evaluations and purchases of a product and service (Featherman and Pavlou, 2003). Bobbitt and Dabholkar (2001) showed that individual's attitude toward using a technology is influenced by individual's perceived risk. Jarvenpaa et al. (2000) also showed how perceived risk can negatively affect customers' attitude toward using online shopping. As Ajzen and Fishbein (1980) proposed, the more positive an individual's attitude towards a particular behavior, the higher the behavioral intention will be and, vice versa. Therefore, it follows that:

H7: Perceived risk is negatively related to repatronage intention of cashierless store.

Perceived benefit can be used in shopping behavior and it is individual's perception of benefits that lead to satisfaction by participating in a particular shopping behavior (Liu et al., 2013). In fact, customers incline to purchase and repurchase products or services that maximize their benefits (Wang and Wu, 2012). Perceived benefits have been empirically shown to influence technology adoption (Banerjee and Golhar, 1994). The findings of Zheng et al. (2006) showed that perceived benefit affects the adoption of e-business significantly. Furthermore, Beatty et al. (2001) also found that perceived benefit has a positive effect on the adoption of corporate website. According to above two studies, it is reasonable to assume that perceived benefit will affect user attitude positively and repatronage intention of cashierless store. Thus, it follows that:

H8: Perceived benefit is positively related to repatronage intention of cashierless store.

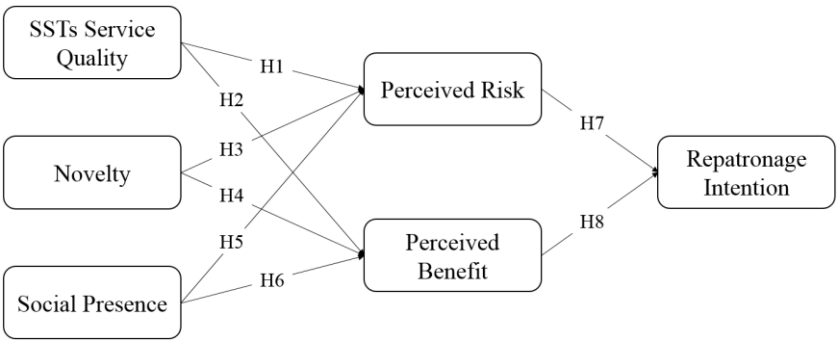
3. Research methods

3.1 Research model

The purpose of this study is to explore the effect of SSTs service quality, novelty, and social presence on repatronage intention from the perspective of perceived risk and perceived benefit. We have found our

research topic and developed hypotheses according to research background, motivation, and literature review. The research model of this study is shown in Figure 1.

Figure 1. Research framework



3.2 Measurement of constructs

The data for this study were collected via an online questionnaire, which measured the constructs of SSTs service quality, novelty, social presence, perceived risk, perceived benefit, and repatronage intentions. Existing measures were used or modified to meet the purpose of this study wherever possible. A 5 point Likert scale was adopted to measure each construct, with 1 being "strongly disagree", and 5 being "strongly agree". References of the measure of constructs are shown in Table 1.

Table 1. Reference sources for the measure of constructs

Construct	Number of items	Reference
SSTs Service Quality	15	Lin and Hsieh (2011)
Novelty	3	Wells et al. (2010)
Social Presence	5	Gefen and Straub (1997)
Perceived Risk	8	Featherman and Pavlou (2003)
Perceived Benefit	5	Yiu et al. (2007)
Repatronage Intention	6	Bhattacherjee (2001), Lee et al. (2009), Žabkar et al. (2010)

3.3 Sample and data collection

For the purpose of data collection, structured questionnaire was developed and distributed in Taiwan from the beginning of December 2018 to the beginning of January, 2019 through online, including Facebook and Ptt (a bulletin board system in Taiwan for public discussion and advice on a wealth of topics), and

convenience sampling was used. Participants, who had shopping experience in convenience store type of cashierless store, were asked to complete the questionnaires anonymously. A total of 304 responses were obtained. After controlling the missing values and eliminating 73 unqualified responses, it yielded 231 statistically usable responses.

3.4 Data analysis method

Confirmatory factor analysis (CFA) was used to assess the reliability and the discriminant validity, concurrent validity, and convergence validity of the scales that measure the constructs. Structural equation modeling (SEM) was conducted mainly to assess normlogical validity, it combines regression and factor analyses to resolve general regression problems and the causal relationship between manifest and latent variables.

4. Data analyses and results

4.1 Descriptive statistics

A total of 231 valid responses were used in the empirical analysis. These samples include diverse demographic backgrounds of respondents. Table 2 illustrates the descriptive statistics.

Table 2. Frequency distribution of features of the samples

Feature		Frequency	%
Gender	Male	120	51.9
	Female	111	48.1
	Total	231	100.0
Age	Under 24	69	29.8
	25 to 34	76	32.9
	35 to 44	50	21.7
	45 to 54	20	8.7
	Above 55	16	6.9
	Total	231	100.0
Educational level	High school	19	8.2
	Undergraduate	128	55.4
	Postgraduate	84	36.4
	Total	231	100.0
Marriage status	Single	174	75.3
	Married	57	24.7
	Total	231	100.0
Current job	Student	59	25.5
	Office worker	132	57.2
	Entrepreneur	9	3.9
	Govt. employee	14	6.1
	Homemaker/retired	16	6.9
	Other	1	0.4
	Total	231	100.0

Monthly salary (NT$)	Under 20,000	57	24.7
	20,001~40,000	91	39.4
	40,001~60,000	46	19.9
	60,001~80,000	20	8.7
	Above 80,001	17	7.4
	Total	231	100.0

4.2 Measurement model

Confirmatory factor analysis was employed through LISREL 8.80 to examine reliability and validity. In order to purify the original measurement model, exhaustive checks were taken on each scale. Due to poor factor loadings or excessive cross-loadings, 13 items were eliminated. Table 3 summarizes the results of CFA for the measurement model on standardized factor loadings, composite reliabilities, and average variances extracted. To check reliability, Cronbach's alpha was computed for each of these variables and their numbers are greater than 0.7 (0.74-0.90), which are above the generally accepted minimum standard. Composite reliability of all constructs are greater than the recommended minimum of 0.60 (0.75-0.90), showing this measurement has good reliability. Each item loads significantly on its respective constructs ranging from 0.59 to 0.84 which demonstrates middle to high convergent validity.

Table 3. Factor and reliability analyses

Construct	Factor Loading	CR	AVE	Cronbach's α
1. SSTs Service Quality (SST)	0.64~0.81	0.89	0.54	0.89
2. Novelty (NVL)	0.59~0.79	0.75	0.51	0.74
3. Social Presence (SP)	0.69~0.84	0.88	0.60	0.89
4. Perceived Risk (PR)	0.61~0.79	0.85	0.53	0.87
5. Perceived Benefit (PB)	0.67~0.74	0.76	0.51	0.76
6. Repatronage Intention (RPI)	0.69~0.79	0.89	0.56	0.90

CR: composite reliability; AVE: average variance extracted

The AVE estimates are greater than 0.5 and the results are satisfactory on all accounts. Table 4 shows the correlations among these variables. Correlations between the overall variables are significant at the 0.05 level. Furthermore, this study also confirms discriminant validity in terms of the square root of the AVE of every construct, which exceeds the off-diagonal correlation coefficients and are significant ($p<0.05$). It provides evidence of convergent validity. The confidence intervals do not include 1.0, which demonstrates discriminant validity support.

Additionally, this study used LISREL 8.80 to examine the measurement model. Although both the goodness-of-fit index and the adjusted-goodness-of-fit index did not exceed the good fit value, 0.9, it still showed acceptable fit with GFI=0.84; AGFI=0.79; Chi-square=648.58; the d.f.=342; the Chi-square/d.f.=1.90; the normed-fit index=0.94; the non-normed-fit index=0.97; the comparative-fit index=0.97; the incremental-fit index=0.97; the relative-fit index=0.93; the root-mean-square residual=0.04; the standardized-root-mean-square residual=0.06; the parsimony-goodness-of-fit index=0.66, and the root-mean-square error of approximation=0.06.

Table 4. Correlations among the analysis variables

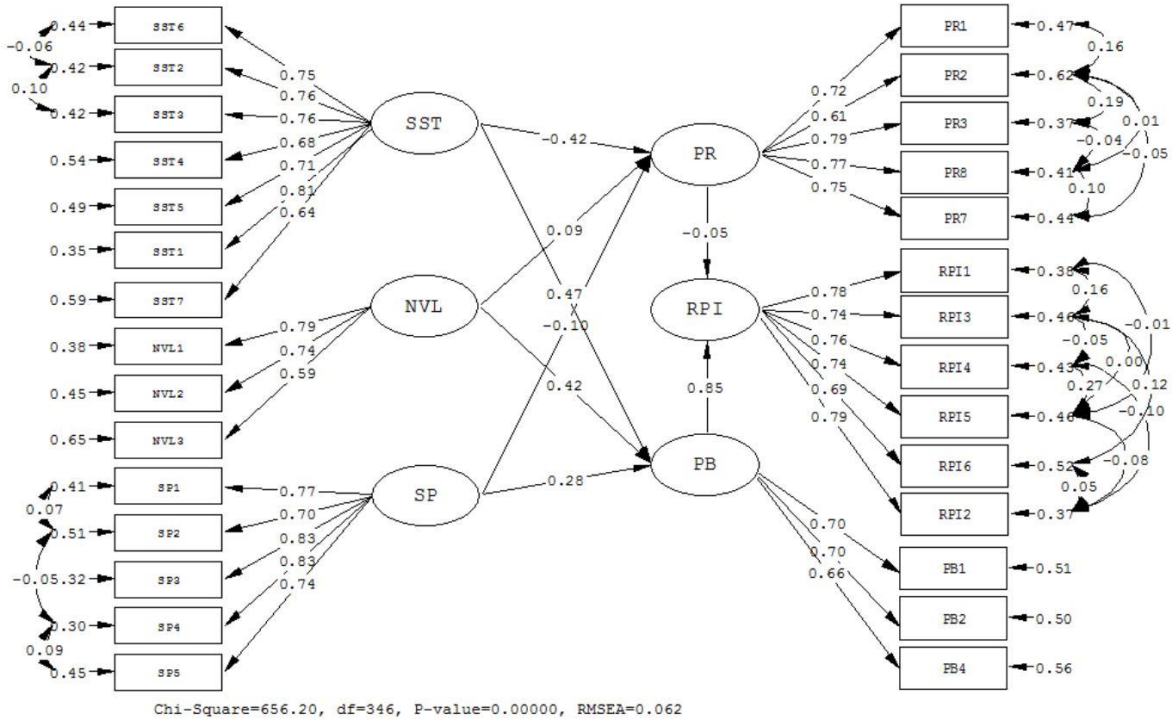
Variable	1	2	3	4	5	6
1	**0.73**					
2	0.49***	**0.71**				
3	0.31***	0.19**	**0.78**			
4	-0.34***	-0.15*	-0.20**	**0.73**		
5	0.66***	0.56***	0.38***	-0.23***	**0.71**	
6	0.61***	0.54***	0.48***	-0.26***	0.65***	**0.75**

Note: The square root of AVE is presented in bold on the diagonal of the table.
***: p<0.001; **: p<0.01; *: p<0.05

4.3 Structure model

This study used Lisrel 8.80 to verify the research hypotheses. The structural path model's estimates are illustrated in Figure 2.

Figure 2. The Structural path model's estimates



First, SSTs service quality affects both perceived risk (β=-0.42, p<0.001) and perceived benefit (β=0.47, p<0.001). Novelty only affects perceived benefit (β=0.42, p<0.001) but not perceived risk (β=0.09, p>0.1). Social presence affects both perceived risk (β=-0.10, p<0.1) and perceived benefit (β=0.28, p<0.001). Second,

perceived risk does not affect repatronage intention (β=-0.05, p>0.1). Last, perceived benefit affects repatronage intention (β=0.85, p<0.001). Table 5 presents the structural model estimates.

Table 5. Structural model estimates

Hypothesized path		β	t-value
SSTs Service Quality → Perceived Risk	H1	-0.37	-3.84***
SSTs Service Quality → Perceived Benefit	H2	0.48	5.98***
Novelty → Perceived Risk	H3	0.06	0.81
Novelty → Perceived Benefit	H4	0.42	5.15***
Social Presence → Perceived Risk	H5	-0.12	-1.28†
Social Presence → Perceived Benefit	H6	0.27	4.99***
Perceived Risk → Repatronage Intention	H7	-0.06	-0.93
Perceived Benefit → Repatronage Intention	H8	0.82	9.26***

β: standardized parameter; †: p<0.1; *: p<0.05; **: p<0.01; ***: p<0.001

4.4 Result

Table 6 lists hypothesis statements and the results. The findings of this study provide evidence between the effects of self-service technologies service quality, novelty, social presence, perceived risk, perceived benefit, and repatronage intention.

Table 6. Hypothesis statement and results

	Hypothesis Statement	Results
H1	SSTs service quality in cashierless store is negatively related to perceived risk.	Supported
H2	SSTs service quality in cashierless store is positively related to perceived benefit.	Supported
H3	Novelty of cashierless store is negatively related to perceived risk.	Not Supported
H4	Novelty of cashierless store is positively related to perceived benefit.	Supported
H5	Social presence in cashierless store is negatively related to perceived risk.	Supported
H6	Social presence in cashierless store is positively related to perceived benefit.	Supported
H7	Perceived risk is negatively related to repatronage intention of cashierless store.	Not Supported
H8	Perceived benefit is positively related to repatronage intention of cashierless store.	Supported

5. Discussion and conclusion

5.1 Discussion

First, the findings support a negative linkage between SSTs service quality and perceived risk (H1) and a positive linkage between SSTs service quality and perceived benefit (H2). The findings support a positive linkage between novelty and perceived benefit (H4). However, they do not support a negative linkage between novelty and perceived risk (H3). The findings support a negative linkage between social presence and perceived risk (H5) and a positive linkage between social presence and perceived benefit (H6). Last, the findings also support a positive linkage between perceived benefit and repatronage intention (H8), but do not support a negative linkage between perceived risk and repatronage intention (H7).

With regard to H1, the result of this study is consistent with the studies conducted by Chen and Dubinsky (2003), suggesting that higher service quality will lead to lower perceived risk. With regard to H2, the result

of this study is consistent with the study conducted by Fararah and Al-Swidi (2013). With regard to H4, the result of this study is consistent with Wells et al. (2010). With regard to H5 and H6, the result of this study is consistent with these previous studies (Hassanein and Head, 2007; Shen, 2012). With regard to H6, the result of this study is consistent with the studies conducted by Tezcan and Akturan (2012).

However, the result of H3 is not consistent with Wells et al. (2010). A possible explanation for this is: for those who adopt innovation, they may have risk taking propensity. According to Rogers (1995), these people can be considered as innovators, which means they are fully aware the uncertainty they are facing and have low perception of risk. Since cashierless stores in Taiwan have opened only for less than a year, they can still be considered as IT innovation. In other words, those who have experienced cashierless store like our respondents are considered as innovators. Therefore, our H3 did not get supported. The result of H7 is also not consistent with previous studies (Chen and Chang, 2012; Park et al., 2005). A possible explanation for this is most of our respondent are below 34 years old, in other words, they grew up in an environment full of information technology, a digital age, so they are familiar with the use and the operation of information technology. According to Prensky (2001), they are so called "digital native". They are exposed to digital technology and digital culture since their birth. Therefore, they are used to using technology. As a result, they may be less concerned with risk associated with using cashierless store. Hence, our H7 did not get supported.

5.2 Implication

For practitioners, the findings of this study suggest that customers' perceived benefit has an important role on repatronage intention. Therefore, we suggest practitioners focus on improving customers' perceived benefit rather than perceived risk. First, SSTs service quality has an important role on perceived benefit. Therefore, we suggest that practitioners to upgrade their self-service technologies' stability continually and provide clear privacy policy in order to increase self-service technologies service quality. Furthermore, practitioners can also provide clear and easy-to-understand "How to Use" instruction, comfortable shopping environment, and variety of products at lower prices to customer in order to increase customer's perceived benefit. In addition, it is important for practitioners of cashierless stores to investigate their customers' experience and evaluate their SSTs continually and identify what other factors will affect customers' perceived benefit. Second, novelty has influence on perceived benefit. Practitioners should also continue to keep their cashierless store "novel", which means new and refreshing, in order to give customers affective belief and increase their perceived benefit. Last, social presence affects both perceived risk and perceived benefit, hence, practitioners have to pay attention to it. We suggest practitioners invest in creating and maintaining effective social presence channels with customers, such as applying verbal or nonverbal social cues in their store in order to create a sense of human contact, warmth and sociability.

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