Understanding Consumers' Continuance Intention Toward Self-service Stores: An Integrated Model of the Theory of Planned Behavior and Push-Pull-Mooring Theory

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Abstract. The development of self-service technologies (SSTs) has significantly changed the interactions between customers and enterprises. Similarly, traditional services are gradually being replaced. Self-service businesses are emerging one after the other, including self-service laundries, gas stations, car washes, ticketing machines, and even self-service stores. This is not merely a new trend, but a revolution in traditional consumption patterns and service models. Why do consumers continue to patronize self-service stores? Is the pushing force or the pulling force leading them to continue to switch from traditional shops to self-service stores? Or is this change the result of planned behavior or intention, determined by attitudes, subjective norms, and perceived behavioral control? This study integrates the theory of planned behavior and push-pull-mooring theory to determine the factors that influence consumers' continuance intention toward self-service stores. Data was collected and analyzed, using structural equation modelling, from 231 consumers who accessed self-service car washes. Results showed that attitude was the most important factor affecting consumers' continuance intention toward self-service stores. This was followed in order of relative importance by fun, habit, perceived behavioral control, and personal innovativeness. Subjective norms, low user satisfaction, perceived ease of use, and cost-savings did not affect consumers' continuance intention toward self-service stores. Implications for theory and practice are being derived from these findings.

Keywords: Theory of planned behavior · Push-pull-mooring theory · Self-service store · Self-service technology

1 Introduction

Enterprises are constantly looking to improve their competitiveness to survive in today's dynamic market environment, characterized by rapid advancements in technology and increase in labor costs. Many companies have responded to these challenges by integrating new technologies into their services, while others have replaced traditional manual services with self-service machines [1]. According to Meuter *et al.* [1], self-service technologies (SSTs) are 'technological interfaces that enable customers

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to produce a service independent of direct service employee involvement' (p. 50). An effective self-service system can help increase productivity, reduce labor costs, and provide more service opportunities [2]. SSTs have become a pillar of the service industries, which includes hotels, financial institutions, transportation and retail consumption environments [3]. Weijters, Rangarajan, Falk, and Schillewaert [4] note that a growing number of retailers are implementing SSTs because of the potential for improved productivity, enhanced quality of service, and reduced labor costs. One example of an SST in the retail sector within the United States is Amazon Go, which was launched in December 2016. This store changed the traditional consumption patterns of a physical supermarket by allowing consumers to purchase products automatically with mobile phones, eliminating the need for cashiers or checkout stations. Such a store not only allows consumers to save time, it also helps service providers to manage consumers' purchasing information accurately. Outside the United States, the largest retailers in Japan, AEON and Walmart, have also set up a number of self-checkout machines in their stores. In China, the Alibaba Group has launched unmanned Tao Cafe stores, and the parent company of RT-MART set up a 24-h checkout-free convenience store, Bingo Box, in 2016. These Chinese stores allowed consumers to scan their Alipay barcodes at the time of entry and pay for goods using self-checkout machines.

Self-service is different from the professional service in that consumers act differently without the assistance of employees and have different expectations when serving themselves [5]. Self-service not only enables consumers to better control the service process but also reduces the workload of service providers. Shorter service hours, fewer staff, and lower service costs have attracted many users to self-service businesses. In their study on selection of online financial services, Ding, Verma, and Iqbal [6] found that the potential for innovation in SST was far greater than that in traditional services. Furthermore, the development of SST has greatly changed the patterns of interaction between customers and enterprises [6–8], and traditional services have gradually been replaced by self-service patterns. Previous studies on SSTs have typically focused on factors affecting the service quality of SSTs [2], attitudes toward SSTs [9–13], consumers' intention to use an SST [2, 8–11, 14–17], actual use of SST [16, 18], and satisfaction with SSTs [1, 8, 14]. However, with the exception of Wang *et al*. [15], few scholars have explored the factors that can lead to the continued use of self-service stores. Bhattacherjee [19] indicates that consumers might not continue to use a new technology even after they have accepted it. A user's willingness to continue use is an important factor in measuring the success of self-service systems. Therefore, understanding the factors that affect consumers' continuance intention toward self-service stores is important for managing the customer–enterprise relationship. Thus, in this work, we address the following research questions: Why do people continue to use an innovative SST? Is continued use due to the influence of push and pull effects, leading customers to switch from traditional to self-service stores? Or is there a planned conversion that is governed by attitudes, subjective norms, and perceived behavioral control? This study integrates Moon's (1995) push-pull-mooring (PPM) theory and Ajzen's (1991) theory of planned behavior (TPB) to explore the factors that serve as the main motivations for consumers to continuously use self-service stores, as well as the relative importance of these motivations affecting consumers' continuance intention. In this way, this study has contributed to the management and administration of self-service stores.

2 Literature Review

2.1 Self-service Technologies

SSTs provide services to consumers through a technological interface, eliminating direct contact with service personnel [1]. The advantage of non-contact service technology is that users participate in the process of procuring a service, and thus, their satisfaction or dissatisfaction with the service becomes solely their responsibility. User participation in the process also makes self-service more enjoyable than traditional services [20]. Šavareikienė and Galinytė [20] suggest that self-service is innovative because it can provide consumers with more attractive features, increase an enterprise's competitiveness, create a new and basic SST, and ensure efficiency. Flexibility is another feature of self-service that influences consumers' satisfaction and enhances their motivation to use an SST. Whether it is Internet banking, online shopping, or package tracking, SSTs feature prominently in the interactions between customers and enterprises [6]. As a result, an increasing number of retailers have switched to SSTs to improve productivity and service quality while reducing costs [4, 6, 13]. According to Meuter *et al*. [1], patterns of SST interfaces include 'telephone-based technologies and various interactive voice response systems, direct online connections and Internet-based interfaces, interactive free-standing kiosks, and video or compact disc technologies' (p. 52). Listed below are the types of SSTs that have been implemented globally [1]: 1. Customer service technologies that provide services related to accounting, bill payments, frequently asked questions, and delivery tracking. 2. Direct transaction technologies that enable customers to order, buy, and exchange resources with companies without direct interaction with employees. 3. Self-help technologies that enable customers to learn, receive information, train themselves, and access self-services.

2.2 Theory of Planned Behavior and Push-Pull-Mooring Theory

The TPB comprises four core dimensions: attitude, subjective norms, perceived behavioral control, and behavioral intention. *Attitude* refers to the degree to which an individual likes or dislikes a particular behavior [21, 22]. If an individual has a more positive attitude toward an action, he or she has a strong intention to carry out such action; conversely, when an individual has a negative attitude toward an action, that individual has less of an intention to act in that way [22, 23]. *Subjective norms* refer to persons or groups (e.g., family, friends, and other persons of relative importance) who do or do not support a particular action and accordingly believe that others should or should not perform such action. In other words, whether an individual or a group supports an action can be affected by the social pressure acting on them when engaging in that action [21, 22, 24]. *Perceived behavioral control* refers to an individual's perception of the difficulty in performing a behavior, or the individual's perceived control over this behavior. This perception can also reflect the influence of past experiences and expected obstacles, and it is affected by the available resources and opportunities [22]. When an individual has more resources and opportunities, perceived behavioral control increases, and the behavioral intention becomes stronger. Therefore,

perceived behavioral control can be used as an important factor in predicting individual behavior [21, 22]. *Behavioral intention* refers to the subjective probability that when an individual wants to engage in a certain behavior, the greater the individual's intention to act, the higher the likelihood that the individual will engage in the action [23]. Ajzen [22] reports a strong positive correlation between intention and behavior, adding that the intention can actually predict behavior.

The PPM theory can be traced back to Ravenstein's laws of migration from the nineteenth century [25]. These laws describe human migrations as influenced by push-pull effects. A push effect is a negative factor that forces people to leave their places of residence, such as lack of job opportunities and bad weather. A pull effect refers to the attraction of new places of residence, such as better job opportunities, higher incomes, and better schools. Some have used this model to describe the migration behaviors of human populations [26]. Longino [27] put forth the concept of a mooring force or a kind of situational constraint. This mooring force may be personal or social and can be either a positive or negative factor that directly or indirectly affects migration intentions and behaviors [28]. Moon [29] combined the concept of a mooring force with the push-pull model, to create the PPM theory. Mooring refers to the lifestyle that encourages or impedes immigrants in their decision making, with possible factors including all personal, social, and cultural differences as well as the possibility of changing the decision to relocate [30]. According to the PPM theory, human migration is affected by push, pull, and mooring forces [25, 27]. Bansal *et al*. [30] discussed the applicability of the migration model and found that the PPM theory was comprehensive. In addition to explaining a population's migration behaviors, the PPM theory can be used as a universal theoretical framework to further explore individuals' decisions to switch between different service providers. This model has been widely used in marketing to predict consumers' behaviors and intentions to switch providers, and other related social phenomena.

3 Research Model and Hypotheses

To develop a model of consumers' continuance intention to use an innovative SST (Fig. 1), we integrated the TPB and the PPM theories because they are appropriate frameworks for understanding human switching behavior. In this study, the pull force could be seen to come from self-service stores, and the push and mooring forces from traditional stores. The study hypotheses were discussed as below.

Ajzen and Fishbein [23] noted that attitudes have a strong and direct influence on intentions and that SST research had identified a direct and positive relationship between attitudes and intentions [9, 10]. The attitude has been deemed an important factor in determining behavioral intention: the more positive the attitudes, the stronger the intention to act [21–23]. Consumers' attitudes toward new technologies affect their usage behavior [2]. Thus, we hypothesized:

H1: Attitude positively affects consumers' continuance intention toward self-service stores.

Ajzen [21] explained subjective norm as the social pressure that an individual is expected to feel when taking part in a particular behavior. When individuals carry out

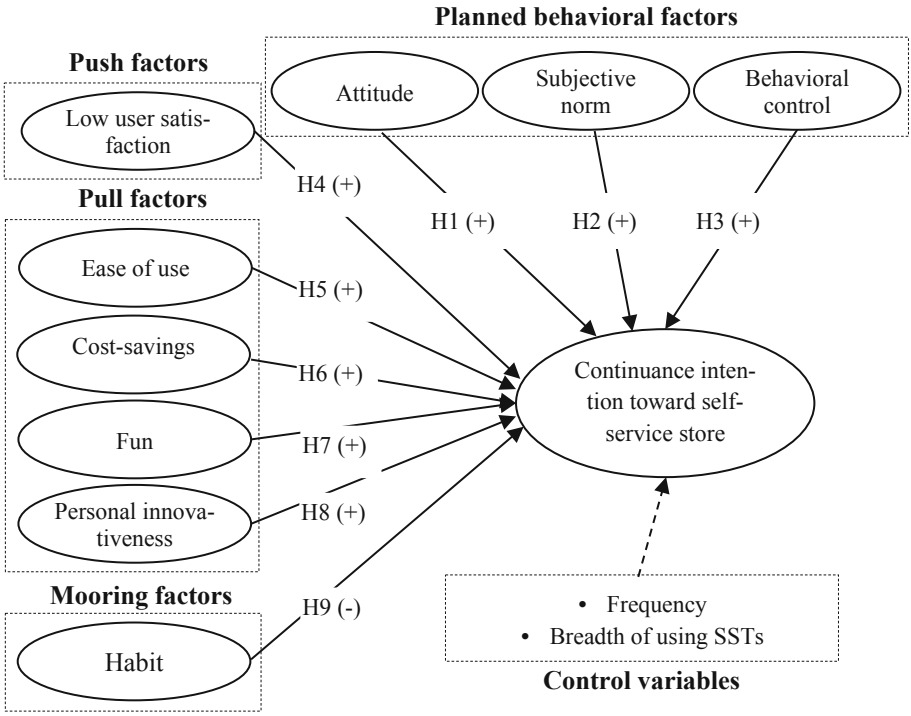


Fig. 1. The research model

an action, they are affected by whether important people or groups around them support such an action. Thus, subjective norms are expected to affect an individual's behavioral intention. In other words, the greater the subjective norm to carry out an action, the greater the behavioral intention [23]. Thus, as we predicted:

H2: Subjective norms positively affect customers' continuance intention toward self-service stores.

According to Ajzen [22], perceived behavioral control refers to people's perception of the level of ease or difficulty in performing a particular behavior. That is, the ease with which an action can be performed affects an individual's decision to engage in such behavior. Consumers choose self-services because they prefer more efficient selection and because self-service gives them a greater sense of control [31]. Thus, when users feel that self-service stores enhance their operational capabilities, the users' continuance intention is higher. Thus, we hypothesized:

H3: Perceived behavioral control positively affects consumers' continuance intention toward self-service stores.

Consumers' switching behavior can be examined using theories similar to those used in the study of human migration, as consumers' switching from one product, service, or service provider to another can be compared to human settlements moving from one geographical area to another. Keaveney and Parthasarathy [32] pointed out that consumers' migration is an important issue in today's rapidly changing market.

According to the traditional migration framework, push forces are the critical factors that cause people to be dissatisfied with their original place of residence and motivate them to leave it [30]. Furthermore, according to Dagger and David [33], satisfaction is an important factor influencing consumer switching behaviors. Previous studies have shown that satisfaction can be used as a predictor of repurchase intention [19, 34]. When satisfaction is high, consumers do not change their original behavioral intentions. However, when satisfaction is low, consumers easily change their behavioral intentions. When consumers receive low service quality and value, their feelings about the service provider are poor, and their trust in and commitment toward the service provider are low as well. This set of circumstances is more likely to produce the intention to switch [30]. In this study, the push factor was defined as a low level of satisfaction with traditional service stores. As a corollary, if consumers are less satisfied with traditional service stores, they are more likely to be attracted to switch to innovative self-service stores. Thus, we predicted:

H4: Low user satisfaction positively affects consumers' continuance intention toward self-service stores.

Another factor that motivates people to migrate is the hope of a better quality of life at the destination area [26]. The same concept can be applied to service switch research, where a company that provides higher quality customer service may attract more consumers [30, 35–37]. In this study, ease of use, cost-savings, fun, and personal innovativeness are being defined as the pull factors of self-service stores.

Perceived ease of use can affect consumers' acceptance of new information technology [10, 38]. Furthermore, studies on ATM use have shown that perceived ease of use is an important factor for customers [11]. Simple operation of an SST, with a clear description and a straightforward process, should lead to customer satisfaction [1] and confidence in the use [15]. Developing a user-friendly SST to increase perceived ease of use is key to SST acceptance [39, 40]. When users think that an SST is easy to use, they have more positive attitudes toward the technology [13]. This study suggests that the more ease consumers experience when using an SST, the more likely they are to continue using self-service stores. Thus, we hypothesized:

H5: Perceived ease of use positively affect consumers' continuance intention toward self-service stores.

Cost-savings is defined as the extent to which a person believes that using a particular system will save money spent on the service [6]. Previous studies have highlighted that SSTs enable users to save money [1]. Howard and Worboys [41] also suggested that cost-savings are one of the great advantages of SSTs. Thus, we hypothesized:

H6: Cost-savings positively affects consumers' continuance intention toward self-service stores.

Fun has also been identified as an important factor for consumers' use of SSTs [3, 31]. In a study of key factors influencing the selection of SSTs, Dabholkar [2] proposed that expected enjoyment is an important measure of the quality of SSTs. If customers believed that they were likely to find self-services interesting, this belief would positively impact their behavioral intention to use the SSTs. In their study of self-service food ordering systems in restaurants, Dabholkar and Bagozzi [10] showed that a sense of fun strongly affected consumers' behavioral intentions. Research on the use of SSTs

among retailers had also shown that fun could affect consumers' attitudes toward the SST [4, 13] and their behavioral intentions [17]. Thus, as we predicted:

H7: Fun positively affects consumers' continuance intention toward self-service stores.

Agarwal and Prasad [42] showed that personal innovativeness is an important indicator of behavioral intentions toward new technology products. A high degree of personal innovativeness may increase the likelihood that a product or technology will be adopted early, and thus, the level of personal innovativeness can be used as an indicator for measuring the acceptance of innovative technologies. In a study of online shopping, Boyle and Ruppel [43] argued that if consumers feel a high level of personal innovativeness when using an SST, they were more likely to continue to use it. Thus, we hypothesized:

H8: Personal innovativeness positively affects consumers' continuance intention toward self-service stores.

In migration studies, mooring force variables are understood to alleviate the relationships between push-pull factors and the migration decision [30]. Habits reflect a person's past automatic behavioral tendencies [44, 45], and therefore, a habit is a decisive factor in predicting people's future behaviors [46]. When behavior becomes a habit, users tend to automatically reference a specific system when making decisions. This study defined habit as the custom of using traditional service stores. When consumers are more accustomed to traditional service stores, they are more likely to continue to use traditional service stores and less likely to switch behaviors and intentions. In other words, consumers will be less inclined to use self-service stores. Thus, we hypothesized:

H9: Habit negatively affects consumers' continuance intention toward self-service stores.

4 Research Methodology

4.1 Data Collection

Data was collected from individuals who had used both self-service car washes and traditional manual car washes in Changhua City, Taiwan. A paper-based questionnaire was distributed to users of self-service and traditional manual car washes, and the respondents who volunteered to participate were given a cleaning cloth (market price NT$50) as a thank-you present. An online survey, identical to the paper-based questionnaire, was also used to increase the response rate. A total of 140 paper surveys was delivered to customers on-site, and 117 valid questionnaires were returned. Furthermore, a total of 127 online surveys were collected, of which 114 were deemed valid. A total of 231 valid questionnaires (117 paper surveys and 114 online surveys) was obtained. Basic information about the population sample is given in Table 1. Men accounted for 91.8% of the total sample, and 92.7% of the responses came from individuals between the ages of 20 and 49 years. Before merging the two datasets, we used the chi-square (χ^2) test to compare the differences between the means of the dependent variable in the paper-based and online surveys. There were no statistically significant differences ($p = 0.117$) between the two datasets.

4.2 Measures

The questionnaire design was mainly based on previous literature, and preliminary interviews were conducted in self-service car wash shops to understand which factors might affect customers' continuance intention toward self-service car washing. The survey instrument was pre-tested by three experts to determine whether the semantics were suitable to self-service car washing contexts. Questions found to be inappropriate were removed. A pilot test was conducted among self-service car wash consumers, and a total of 40 surveys was recovered in the pilot. The questions with poor reliability and validity were revised. The survey items were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Table 1. Demographic information of sample (N = 231)

Variables	Count	Variables	Count
Gender		**Experience in using SST**	
Female	19	Self-service car wash	231
Male	212	ATMs	182
Age		7-11 ibon machine	172
20 years old and younger	11	Self-service gas station	159
20–29 years old	61	Online banking	136
30–39 years old	96	Easy Card value-adding machines	131
40–49 years old	57	Self-service ticketing	129
50–59 years old	5	Self-service laundry	100
60 years old and older	1	Delivery tracking	100
Education level		Voicemail system	84
High school degree and below	69	Self-check-in at an airport	76
Bachelor's degree	128	Others	4
Master's degree	28	**The frequency of use of a self-service car wash**	
PhD degree	6	Less than once a month	33
		Once a month	39
		2–3 times per month	86
		More than 4 times per month	73

5 Results

5.1 Reliability and Validity

Reliability refers to the dependability of the data or the degree of consistency of repeated measurement results [47]. This study used Cronbach's alpha coefficient and composite reliability (CR) to perform the relevant measurements. The higher the reliability of the questionnaire, the higher the reliability of the scale. The coefficients for all the constructs ranged from 0.62 to 0.95, with all measures surpassing the acceptable Cronbach's alpha value of 0.6 [47]. The composite reliability test also

produced similar results, with all measures ranging from 0.81 to 0.97, surpassing the recommended level of 0.7 for reliable constructs [48].

Convergent validity is a measure of the degree of convergence of each dimension or the degree to which the relevant factors are classified in the same dimension. Convergent validity exists when factor loadings are greater than the threshold value of 0.50 [47] and the average variance extracted (AVE) is at least 0.50 [49]. All factor loadings for the corresponding constructs were higher than the threshold value of 0.50, and the AVE values ranged from 0.684 to 0.934, confirming adequate convergent validity (Table 2). Discriminant validity was assessed using the Fornell and Larcker [49] criterion. The Fornell–Larcker criterion assessed whether the square roots of the AVE values were greater than the inter-construct correlations. In the Fornell–Larcker criterion calculations shown the bold values, along with the diagonal line, were the AVE square root of each variable, which were greater than the correlation coefficients of the other variables, indicating good discriminant validity.

5.2 Structural Model

We created a partial least squares (PLS) model—a component-based structural equation modeling technique—in SmartPLS 3.0 to test the research hypotheses [51]. We used PLS in this study because (a) PLS maximizes the variance explained in the dependent variables, (b) it is less demanding on the sample size, and (c) it does not assume multivariate normality [52]. Some variables were not normal, such as fun, ease of use, and continuance intention, and had high skewness or high kurtosis. We used the bootstrapping technique with 5,000 iterations to estimate the path coefficient, where the path coefficient indicated the strength between the variables. Figure 2 displays the path coefficients and the explained construct variances.

6 Discussion, Implications, and Limitations

6.1 Discussion

There are four main findings. *First*, the results showed that subjective norms did not have a statistically significant correlation with the continuance intention of self-service stores, possibly because self-service car washing is a personal preference for consumers in addition to a need. One respondent explained that car washing was sometimes a hobby through which he could provide good car maintenance and in addition to while away time. This might be why subjective norms do not seem to affect the choice and continuance intention. *Second*, in the theory of migration, the push effect refers to the negative factors that force people to leave their place of origin [26]. In this study, low user satisfaction with the traditional, manual car washing services was considered a push factor affecting the consumers' continuance intention toward self-service stores. The results of this study showed that low service satisfaction with traditional manual car washing did not significantly affect consumers' continuance intention toward self-service stores. In interviews, consumers explained that they did not choose self-service car washes because they were dissatisfied with the traditional manual car wash services.

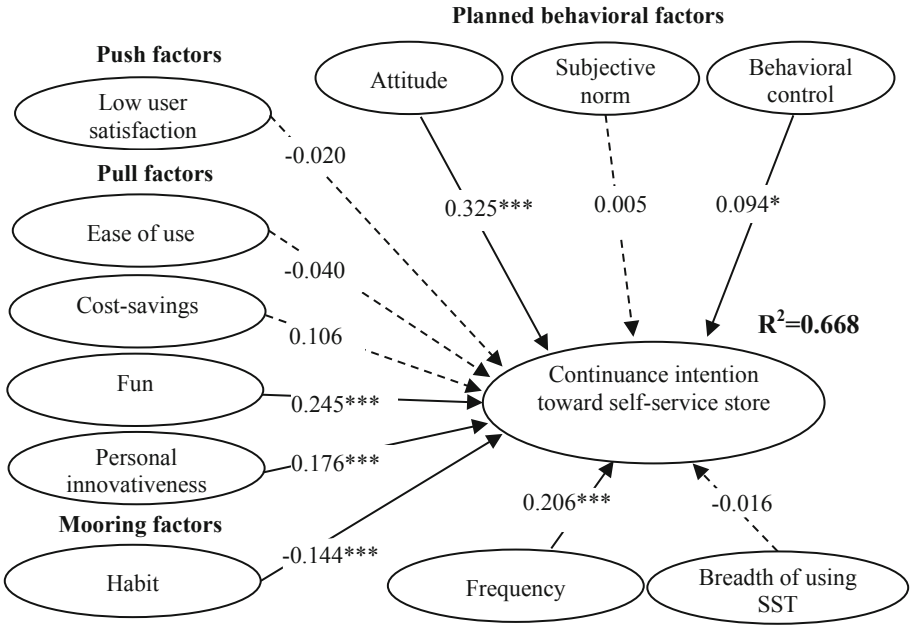
Table 2. Convergent validity

Variables and items	Factor loading	AVE
Attitude [24]		0.685
1. Using a self-service car wash is a good idea	0.857	
2. Using a self-service car wash is a wise idea	0.845	
3. I like the idea of using a self-service car wash	0.850	
4. Using a self-service car washing is a pleasant experience	0.755	
Subjective norm [24]		0.727
1. People who influence my behavior would think that I should choose a self-service car wash	0.926	
2. People who are important to me would think that I should choose a self-service car wash	0.773	
Perceived behavioral control [24]		0.822
1. I am able to operate the self-service car wash equipment	0.910	
2. Using self-service car wash machinery is entirely within my control	0.917	
3. I have the resources, knowledge, and ability to help me use the self-service car wash equipment	0.893	
Low user satisfaction (adapted from Wang [50]**)**		0.837
1. I'm not satisfied with traditional manual car washes	0.874	
2. I feel traditional manual car washes have no way of providing high-quality car washing services	0.932	
3. The traditional manual car wash cannot meet my expectations	0.936	
Ease of use [4]		0.718
1. I think the operation of self-service car wash equipment is effortless	0.855	
2. I think self-service car wash equipment is user-friendly	0.840	
Cost-savings (developed based on Meuter, Ostrom [1]**)**		0.684
1. Compared to a traditional manual car wash, a self-service car wash is cheaper	0.967	
2. I choose self-service car washes because I want to save money	0.659	
Fun [10]		0.906
1. I feel it's very interesting to use a self-service car wash	0.948	
2. I think it's fun to use a self-service car wash	0.955	
3. I enjoy the process of using a self-service car wash	0.952	
Habit [45]		0.724
1. Compared to self-service car washes, the use of traditional manual car washes is automatic to me	0.875	
2. Compared to self-service car washes, the use of traditional manual car washes is natural to me	0.892	
3. Compared to self-service car washes, if there is demand, traditional manual car washes are an obvious choice for me	0.781	

(*continued*)

Table 2. (*continued*)

Variables and items	Factor loading	AVE
Personal innovativeness [42]		0.717
1. If I hear about a new self-service technology, I would look for ways to experiment with it	0.772	
2. Among my peers, I am usually the first person to try out new self-service technologies	0.871	
3. In general, I don't hesitate to try out new self-service technologies	0.827	
4. I like to experiment with new self-service technologies	0.911	
Continuance intention toward self-service store [45]		0.934
1. If possible, I would like to continue to use self-service car washes	0.967	
2. After considering all the circumstances, I will continue to use self-service car washes in the next two months	0.966	



*p<0.05; ** p<0.01; ***p<0.001; Dotted line represents no significance.

Fig. 2. Research model results

Rather, their choice was influenced by the time factor, as they were sometimes too busy to park their cars in the traditional manual car washes for several hours. A 24-h self-service car wash is different from the traditional manual car wash service in that it is not limited by business hours; consumers have the flexibility to choose their period of consumption. Moreover, the self-service car wash provides a variety of self-help

services, such as high-pressure flushing, foaming, water wax, air guns, vacuum cleaners, and pneumatic waxing machines. These car washes also have automatic cash machines, vending machines, and various car washing tools (e.g., all kinds of sponges, maintenance and waxing supplies, and absorbent cloths). Consumers can choose from all of these services, which makes the service highly convenient and a good alternative service choice. Apart from these reasons, personal preference also played an important role. Some consumers simply preferred a self-service car wash regardless of whether the car was old or new and even if they were busy, because they enjoy the process of a self-service car wash. This result was consistent with the that shared by Ganesh, Arnold [53], who found that users did not switch shops because of dissatisfaction but because of other factors. *Third*, with regard to pull factors, ease of use did not affect the consumer's continuance intention toward self-service stores, which was inconsistent with previous researches [4, 40]. Consumers explained that ease of use did not influence their choice of self-service car wash as it actually required considerable time and effort to use. There was no statistically significant relationship between cost-savings and continuance intention, which was also inconsistent with the results proposed by Howard and Worboys [41]. In interviews, consumers said that they chose the self-service car washing because of their love for and interest in cars. They wanted to spend more time taking care of their cars, and they typically spent elsewhere from 2–3 h to 6–8 h. *Finally*, a sense of fun was the most statistically significant pull factor vis-à-vis consumers' continuance intention. With technology that is substitutable, customers are more concerned with the enjoyment in using the service than with the service itself [40].

6.2 Implications

From a theoretical perspective, the present study made important contributions to the SST literature. Firstly, this study integrated the TPB and the PPM theory. In addition to approaching intention formation from the perspective of attitudes, subjective norms, and perceived behavioral control, this study combined factors from information system and SST literatures, such as user satisfaction, ease of use, cost-savings, fun, personal innovativeness, and habits. These factors are often cited in the study of acceptance, adoption, or use of an innovative technology. This integration not only enhanced the richness of this research stream but also improved the integrity of the research framework. Secondly, research on SST outcomes had mostly studied factors such as user motivation, intention to use, satisfaction, service quality, technology readiness, and customer loyalty. Few studies had approached the issue from the perspective of continuance intention. This study enhanced one's understanding of SST continuance intention by viewing the topic through a new lens: push-pull-mooring factors. This study provided empirical support for and insights into previous SST literature, which often emphasized the technological factors of SSTs (i.e., perceived ease of use, usefulness, and fun), but not factors related to traditional services. Thirdly, the example of self-service car wash, used in this study, presented a new, innovative SST that is currently in its initial stage of implementation. Thus, this study can be used as a behavioral model for understanding switching intentions toward early SSTs. Finally, the self-service car-wash shops studied in this work were environments requiring a high

level of user involvement, and the results showed that in highly involved environments, fun was a statistically significant predictor of continuance intention. Such fun was very important to SST providers because it formed the basis for self-help in the long term.

The present study makes the following practical contributions. Firstly, it found that traditional shops and self-service shops might be business models that could coexist, as consumers chose SSTs not because of their dissatisfaction with traditional service technologies but because they seeked more flexibility. Therefore, company managers must realized that consumers needed alternative solutions to meet their requirements. Secondly, fun was an important factor influencing consumers' continuance intention. Accordingly, we recommend firstly that SST providers focus on a practical strategy for designing a hedonic-oriented interaction. This can enhance the continuance intention toward the SST. Secondly, SST design should shift from a transaction-first approach to an experience-first approach to maintain customer loyalty. For instance, SST providers should offer an interactive and attractive interface to improve consumers' experience with the use process. Finally, this study showed that an individual's habit of using traditional stores tends to reduce his or her continuance intention toward self-service stores. Hence, the marketing strategies of SST providers should focus on the pull factors (e.g., perceived fun) so that customers are willing to switch from a satisfactory situation.

6.3 Limitations

This study has certain limitations. Firstly, the study might have regional limitations. The paper-based questionnaire was distributed at two self-help car wash shops in central Taiwan; therefore, the sample data might not be representative of the vast majority of consumer opinions across Taiwan. However, we tried to mitigate this limitation by collecting some of the data via an online questionnaire. The second limitation pertains to the case studied. This study explored only self-service car wash shops, and it is difficult to generalize the results to other types of self-service stores. However, it is important to add that self-service car wash shops are a gradually emerging SST in Taiwan, and these research results can be extended to other self-service stores to improve the understanding of switching intention among early technology users. Additionally, in view of the increasing popularity of self-service stores and the novelty of interactive interfaces for self-service, we believe that future researchers should conduct an empirical analysis of other types of self-service and provide a broader and more diversified reference for enterprises and operators planning their business models.

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