The Relationship between the Technology-Based Self-Service Convenience Orientation Factor and Convenience in Retail Stores*

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Abstract

Purpose – The purpose of this study is to investigate the relationship that is found to exist between the technology-based self-service convenience orientation factor and the factors of convenience and quality.

Research design, data, and methodology – The questionnaire was developed by using the modified and supplementary questions that were examined in previous studies. We used the SPSS/PC 18.0 and lisrel 8.3 statistical packages to analyze the results of the research. For validating the research hypothesis and structural relationship of the research model, path analysis was used in this study.

Results – The ease of use exerted a significant influence on the four dimensions. Information had a significant influence on transaction, benefit, and post-benefit convenience. Control had a significant influence on five dimensions.

Conclusions – This study suggests that technology-based self-service convenience is classified into five multi-dimensional levels. Further, the study reveals that control, ease of use, and information are important variables in order to increase convenience. Therefore, for improving technology-based self-service convenience, it is important to improve the control, ease of use, and information variables.

1. Introduction

Technology-based self service that customers could produce and give service by themselves gave benefit that consumers were allowed to minimize time, expenses and efforts. The studies on technology-based self service should evaluate services from point of view of consumers' response to accept and expand technology-based self service. Therefore, technology-based self service could lessen time and efforts at production and transfer of the services to be one of means that provided consumers with services (Colwell et al., 2008).

Studies on technology-based self service are useful in understanding new forms of service transfer, but their focuses are limited mainly on initial users' decision on whether to use the service, on relationship between attitude and intention and on testing customer evaluation such as perceived value satisfaction and continued mutual interaction using service quality as a mediating variable, and do not provide definite customer evaluation on technical options provided. Since one important aspect in customer evaluation on technology-based self service is the importance of minimizing time and effort in service provided, it is necessary to understand service evaluation in terms of ease of use.

The convenience was thought to be at each stage of service activities that consumers experienced. Studies considering such a fact were very much limited, and most of studies were focused on relations with consequences of service quality and customer values. Business related factors as well as convenience orientation factors such as consumer characteristics played an important role at consumers' purchase (Berry et al., 2002), and studies on technology-based self service said that easy use, control and information of the services cognized by users played an important role at convenience (Berry et al., 2002; Hua, 2009; Shen et al., 2010).

This study classified convenience of technology-based self service into multi-levels to make system by each stage of serv-

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ice activity stages to investigate relations among convenience, convenience orientation factors and technology-based self service quality and to help understand mechanism of the use and establish effective marketing strategies.

2. Precedent Studies

2.1. Convenience of Technology-based Self Service

Convenience of technology-based self service is said to be time and effort for discovery and use of self service technology (Collier & Sherrell, 2009). The convenience has the closest relations with values (Rust et al, 2004) to explain purchase decision-making and to increase purchase frequency (Seiders et al., 2005). However, studies on the convenience were short of appropriateness of construct to be difficult to test overlap between levels. Convenience was not evaluated depending upon levels of experience of the services. These days, studies on test of appropriateness of the convenience at multi-levels had difficulties at development of appropriate and comprehensive concept. (Berry et al., 2002; Seiders et al., 2006; Colwell et al., 2008; Liao, 2014a,b).

2.2. Convenience Orientation Factors

2.2.1. Ease of Use

Ease of use was said to be belief of the ones who think of less efforts in the use of special system (Davis, 1989). Consumers were interested in ease of use considering some of reasons including less effort (Dabholkar, 1996). In particular, ease of use helped make less spiritual effort under technical environment. And, ease of use should require less spiritual and physical effort. Ease of use was important at self service technology that required not only spiritual effort but also physical effort (Collier, 2004). Studies on other ease of use were made (Koo, 2005).

2.2.2. Information

Information gave in-depth information having relations with decision-making (Yang, 2013). Consumers worried about long stand by time and/or uncertainty at the use of service (Berry et al., 2002), and technology-based self service to which consumers were not accustomed gave a lot of good quality information that existing transactions did to select service easily. Also, Consumers can more easily and quickly reach a decision, when channeks are perceived to distribute more relevant information (Broekhuizen & Jager, 2003).

2.2.3. Control

Control was said to be individual's belief that could make change of environment in desirable direction at specific time. (Greenberger & Strasser, 1986). Control had influence upon self

service quality evaluation (Shamdasani et al., 2008) to increase convenience. And, control mediated physical environment of service contacts and consumers' emotional and behavioral responses toward employees (Hui & Bateson, 1991). Service could be accepted either at overall evaluation of innovation or at affirmative situation to rely upon control.

2.3. Technology-based Self Service Quality

Technology-based self service allowed customers to produce and transfer services by themselves to rely upon mutual reactions with technology. The service quality reinforced cognition on the quality by various kinds of factors of technology-based customer interface, and cognition on the quality promoted and/or increased customer preference. In particular, customers who were joint producers spent time, physical resource and spiritual resource directly and/or indirectly, so that technology-based self service quality played very much important role at connection between enterprises and customers. This study referred to discussions on the quality (Singh, 2013; Kim, 2013; Hwang, 2013; Woo et al., 2014).

3. Research Designs

3.1. Hypotheses

Ease of use had significant influence upon convenience (Broekhuizen, 2006), Hua, 2009, and Yoon & Kim, 2007). Role of ease of use might vary depending upon familiarity to let consumers with less familiarity lessen time and effort (Shamdasan et al, 2008).

Hypothesis 1: Ease of use has affirmative influence upon convenience of technology-based self service.

H 1.1 : Ease of use has affirmative influence upon decision convenience of technology-based self service.
H 1.2 : Ease of use has affirmative influence upon access convenience of technology-based self service.
H 1.3 : Ease of use has affirmative influence upon transaction convenience of technology-based self service.
H 1.4 : Ease of use has affirmative influence upon benefit convenience of technology-based self service.
H 1.5 : Ease of use has affirmative influence upon post-benefit convenience of technology-based self service.

Information had significant influence upon convenience (Berry et al, 2002). Findings of relations between information and convenience were rather contradictory, and relation between information and convenience had enough theoretical base to test relations (Broekhuizen, 2006).

Hypothesis 2: Information has affirmative influence upon con-

venience of technology-based self service.

- H 2.1 : Information has affirmative influence upon decision convenience of technology-based self service.
- H 2.2 : Information has affirmative influence upon access convenience of technology-based self service.
- H 2.3 : Information has affirmative influence upon transaction convenience of technology-based self service.
- H 2.4 : Information has affirmative influence upon benefit convenience of technology-based self service.
- H 2.5 : Information has affirmative influence upon post-benefit convenience of technology-based self service.

Behavioral control perceived has affirmative relation with convenience perceived (Collier and Sherrell, 2010), Shen et al, 2010). The control played very much important role at consumers' emotional effort and cognitive effort (Berry et al, 2002). The control was found to be important factor that could increase perception of convenience.

Hypothesis 3: The control has affirmative influence upon convenience of technology-based self service.

- H 3.1 : The control has affirmative influence upon decision convenience of technology-based self service.
- H 3.2 : The control has affirmative influence upon access convenience of technology-based self service.
- H 3.3 : The control has affirmative influence upon transaction convenience of technology-based self service.
- H 3.4 : The control has affirmative influence upon benefit convenience of technology-based self service.
- H 3.5 : The control has affirmative influence upon post-benefit convenience of technology-based self service.

The service convenience was precedent factor of service quality (Andaleeb & Basu, 1994), Berry et al, 2002), and service convenience that was important index of website quality had affirmative relation (Zhang & Prybutok, 2005, Udo, 2010). Not only transaction convenience but also post benefit convenience had significant influence and benefit convenience had no influence (Xie, 2010).

Hypothesis 4: Convenience of technology-based self service has affirmative influence upon technology-based self service quality.

- H 4.1: Decision Convenience of technology-based self service has affirmative influence upon technology-based self service quality.
- H 4.2: Access Convenience of technology-based self service has affirmative influence upon technology-based self service quality.
- H 4.3: Transaction of technology-based self service has affirmative influence upon technology-based self service quality.
- H 4.4: Benefit of technology-based self service has affirmative

influence upon technology-based self service quality.
- H 4.5: Post-benefit Convenience of technology-based self service has affirmative influence upon technology-based self service quality.
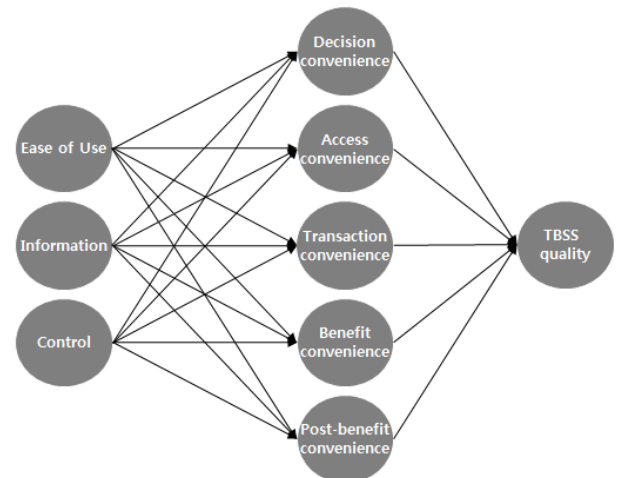
<Figure 1> Research Model

3.2. Operational Definition and Testing Methods of the Variables

Ease of use was thought to require less effort in the use of technology-based self service (Hua. 2009; Broekhuizen, 2006; Shamdasani et al., 2008), and information had relation with decision-making of the use of technology-based self service to give in-depth information (Chen & Dubinsky, 2003; Broekhuizen, 2006), and control was thought to be user's control of courses and results at self service contact at his or her discretion to exercise power (Collier & Sherrell, 2010; Shamdasani et al., 2008), and technology-based self service convenience was time and effort perceived to look for technology-based self service and to promote use (Berry et al., 2002; Seiders et al., 2006; Hua, 2009), and technology-based self service quality was thought to be customers' judgment and/or attitudes concerning excellence of the service supplied to test in Rikert 5-scales (Anitsal, 2005; Shamdasani et al., 2008).

3.3. Methodologies

The subject was adults at Daegu, Ulsan, Seoul and Gumi who experienced use of technology-based self service (self counter). The authors distributed 350 copies and collected 346 copies (98%), and 332 copies were used after excluding 14 copies with improper answers. An empirical analysis was done.

4. Empirical Analysis

4.1. Characteristics of the Samples

In this study, 332 interviewees had demographic characteristics (Table 1):

4.2. Fitness Test of Models

Fitness of the models was thought to be appropriate considering fitness indexes (Table 2):

<Table 1> Characteristics of the Samples

Gender	Age	Educational background	Marital status	Household income	Occupation
Men: 97(29.2) Women : 235(70.8)	20s: 135(40.7) 30s: 92(27.7) 40s: 82(24.7) 50s: 21(6.1) 60s: 2(0.6)	High school graduate: 60(18.1) Undergraduate school students: 126(38.0) College graduate: 126(38.0) Graduate school graduate or higher: 20(6.0)	Married: 165(49.7) Single: 167(50.3)	below than 250: 66(19.9) 250-350: 107(32.2) 350-450: 111(33.4) 450 or higher: 48(14.5)	Company worker: 82(24.7) Full time homemaker: 44(13.3) Self employed: 14(4.2) Special job: 34(10.2) Government official: 21(6.3) Students: 119(35.8) Miscellaneous: 18(5.4)
332(100.0)	332(100.0)	332(100.0)	332(100.0)	332(100.0)	332(100.0)

<Table 2> Confirmatory Factor Analysis

Concept		Scale	Internal consistency		Convergent validity			
			Cronbach Alpha	Correlation coefficient on average between items and concept	Factor loading	Measurement errors	Reliability coefficient	Variance extracted
Convenience orientation	Ease of use	Complexity of procedure of the use	0.758	0.625	0.787	0.381	0.763	0.518
		Confusion of procedure of the use		0.643	0.798	0.363		
		Less effort		0.506	0.583	0.660		
	Information	Supply of standby time information	0.753	0.604	0.745	0.445	0.753	0.505
		Transaction sequence confirmation		0.578	0.711	0.494		
		Expected difficulties		0.564	0.679	0.539		
	Control	Transact in the way wanted	0.719	0.572	0.749	0.439	0.755	0.508
		Run smoothly		0.562	0.705	0.503		
		Control of transaction process		0.518	0.693	0.520		
Technology based self service convenience	Decision-making convenience	Time for acquisition of information	0.729	0.574	0.832	0.308	0.742	0.592
		Ease of service use decision-making		0.574	0.690	0.524		
	Access convenience	Place to find out easily	0.840	0.737	0.828	0.314	0.810	0.588
		Time to arrive		0.732	0.843	0.289		
		Convenience of the access		0.649	0.740	0.452		
	Transaction convenience	Effort at the transaction	0.822	0.686	0.796	0.366	0.794	0.564
		Convenience at the transaction		0.698	0.812	0.341		
		Completion of quick transaction		0.650	0.734	0.461		
	Benefit convenience	Effort needed to give service	0.685	0.573	0.735	0.460	0.715	0.558
		Completion of transaction without waste of the time		0.573	0.710	0.496		
	Post benefit convenience	Quick problem solving	0.807	0.630	0.733	0.463	0.785	0.550
		Additional service processing		0.701	0.827	0.316		
		Easiness of problem solving		0.637	0.738	0.455		
Technology-based self service quality		High level of service quality	0.851	0.630	0.868	0.247	0.819	0.602
		Excellent service quality		0.701	0.849	0.279		
		Good service quality		0.637	0.727	0.471		
Chi-Square=397.720, df=239, p-value=0.00, RMSEA=0.045, RMR=0.021, GFI=0.917, AGFI=0.887, NFI=0.903, CFI=0.958								

4.3. Discriminant Validity Analysis

In this study, discriminant validity analysis showed that square of most of correlation coefficients was smaller than variance extracted to have discriminant validity between concepts (Table 3):

4.4. Hypothesis Testing

The structural models had goodness-of-fit to be χ^2 of 450.154 and degree of freedom of 317(χ^2/d.f=1.42, p=0.00). Not only RMR of 0.028 but also RMSEA of 0.036 satisfied levels recommended. Not only NFI but also CFI was 0.901 and 0.968 each to exceed recommendation standard. GFI of 0.916 satisfied recommendation standard.

Hypothesis 1 : Other conveniences than post benefit convenience have affirmative influence.

Post benefit convenience seem to have no effect because of the differences in time of evaluation. Transaction convenience measured attributes on specific service transfer option prior to using such service and post benefit convenience measured problems related to re-contacting service provider after service problems have occurred since executing such service.
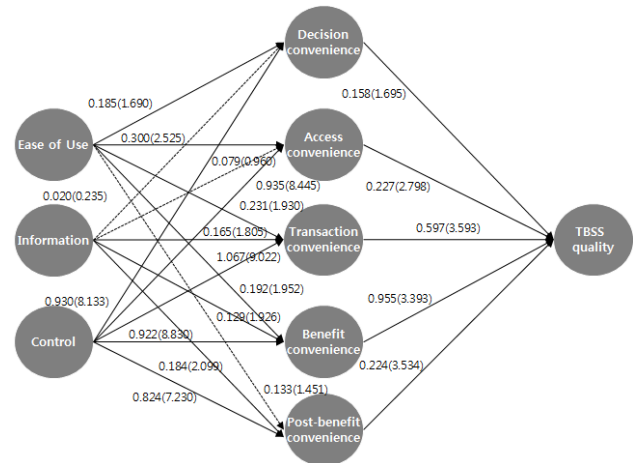
Hypothesis 2 : Information has affirmative influence upon transaction convenience, benefit convenience and post benefit convenience.

Hypothesis on transaction convenience and access convenience was rejected because, even though information have effect on providing information prior to use or in early introductory stages, survey was conducted on users with prior experience in this study.

Hypothesis 3 : Control has significant relations with decision-making convenience, access convenience, transaction convenience, benefit convenience and post benefit convenience.

Hypothesis 4 : Decision-making convenience, access convenience, transaction convenience, benefit convenience and post benefit convenience have significant influence upon technology-based self service quality.

<Figure 2> Hypothesis Testing Result

<Table 3> Discriminant Validity Analysis

	Ease of use	Information	Control	Decision-making convenience	Access convenience	Transaction convenience	Benefit convenience	Post benefit convenience	TBSS quality
Ease of use	0.518								
Information	0.399(0.159)	0.505							
Control	0.430(0.185)	0.243(0.059)	0.508						
Decision-making convenience	0.350(0.123)	0.215(0.046)	0.443(0.196)	0.592					
Access convenience	0.316(0.100)	0.223(0.050)	0.434(0.188)	0.506(0.256)	0.588				
Transaction convenience	0.419(0.176)	0.309(0.095)	0.470(0.229)	0.528(0.279)	0.631(0.398)	0.564			
Benefit convenience	0.425(0.181)	0.316(0.100)	0.484(0.234)	0.550(0.303)	0.557(0.310)	0.687(0.472)	0.558		
Post benefit convenience	0.315(0.099)	0.273(0.075)	0.336(0.113)	0.413(0.171)	0.448(0.201)	0.548(0.300)	0.585(0.342)	0.550	
TBSS quality	0.313(0.098)	0.256(0.066)	0.422(0.178)	0.505(0.255)	0.511(0.261)	0.485(0.235)	0.579(0.335)	0.515(0.265)	0.601

※ Diagonal coefficient indicates variance extracted, values in the table indicate correlation coefficient and the ones in parentheses doe square of correlation coefficient.

5. Summary

The results of the empirical study can be summarized as follows: First, use of ease exerted significant influence on four dimensions of technology-based self service convenience-decision, access, transaction, benefit-except post-benefit convenience. Second, information had significantly affects transaction, benefit, and post-benefit convenience while dimensions—decision, access convenience had insignificant effects by information. Third, control had significant influence on five dimensions of technology-based self service convenience. Finally, testing the hypothesis that technology-based self-service convenience would have significant effects on technology-based self-service quality revealed that decision, access, transaction, benefit, and post-benefit convenience had significant relationship.

The implications were:

First, the study investigated technology-based self service convenience according to decision-making convenience, access convenience, transaction convenience, benefit convenience and post benefit convenience to test reliability and validity and to establish theoretical system of the convenience by in-depth and systematic way.

Second, the study investigated relation between technology-based self service convenience factors such as ease of use, information and control and multi-dimensional technology-based self service convenience to suggest needs of the study on increase of the convenience.

And, managerial implications were:

First, enterprises shall consider ease of use to increase technology-based self service convenience. Users who know and understand use of technology-based self service cognize usefulness of the service. In particular, service providers shall inform users of ease of use by demonstration marketing prior to use of technology-based self service to give stable and reliable system that does not produce psychological instability at the stage of communication development as well as use of the service.

Second, use and problem solving of technology-based self service shall be informed to increase users' convenience during and/or after use of the service. Users are allowed to make use of service more effectively and to be given service benefit with less effort as soon as possible and to increase expectation on the service even after use of the service.

Third, users shall expect of accomplishment of the outcome in correct direction at all of stages of service activities, that is to say, before, during and after use of the service.

While this study has both managerial and theoretical implications, this study has following limitations as well. First, it has limitations in generalization. This study, which was conducted on self checkout counters at discount stores, failed to properly reflect features of technology-based self-service by types. Future studies should be based on other forms of technology-based self service to study the difference in technology-based self service convenience. Second, only ease of use, information, and control were used as factors that increase technology-based self-service convenience. Other factors such as fa-miliarity, experience, perception on time and effort and individual traits among technology-based self-service favoring groups and technology-based self-service non-favoring groups would result in different findings in terms of perception on convenience. Third, the study gave cross-sectional analysis results between variables.

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