How Service Convenience Influences Information System Success

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Abstract—**The purpose of this paper is to examine the effect of Service Convenience (SERVCON) towards Information System (IS) success model. This study conceptualizes SERVCON as a dependent variable, six-dimensional construct that represent IS users' perceived time and effort when in interaction with the service. Technological advances and generalization of the IS users have led SERVCON to be considered as a potential influence of IS success model. This study conduct an analysis of survey data from 290 students from public university in central Taiwan, consisting of undergraduate, master, and doctoral students, about recent use of Student Information System (SIS). Results of this paper strongly support that SERVCON is one of important factor for IS success. In addition, SERVCON construct can assist IS service providers reduce users' time and effort to decide, access, search transact, benefit, and post- benefit when they consume the services.**

Index Terms—**Service convenience, SERVCON, information system, student information system, IS SERVCON.**

I. Introduction

Since a long time ago, many researchers have been observing information system (IS) success factors. some of them, DeLone and McLean (1992), have proposed IS success measurement and classified them into six major dimension: (1) system quality: the measures of the IS itself, (2) information quality: the measures of IS output, (3) information use: recipients consumption of the use of the IS output, (4) user satisfaction: recipients response to the use of the IS output, (5) individual impact: the effect of information on the behavior of recipients, and (6) organizational impact: the effect of information on organizational performance (Eldon, 1997).

The generalization of IS users and absence of mediation assistant provide insight of IS service convenience (SERVCON) construct need to be considered as IS success factors. This study focuses on how service convenience may influence Information System (IS) success. In globalization era with technological advances, many IS applications such as E-commerce, Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Customer Relationship Management (CRM), Student Information System (SIS), etc., are developed to help users in getting information digitally or via computer networks without delay.

Previous studies about development of computer user's satisfaction measurements mentioned convenience of access was one of the success factor and declared convenience of access as either easy or difficult with which the user may act to utilize the capability of the computer system (Bailey and Pearson, 1983). Research in retail field defined SERVCON as easy and fast shopping (Seiders *et. al.*, 2000). Another research conceptualized SERVCON as five-dimensional construct that reflects consumers' perceived time and effort in purchasing or using a service (Berry *et al*, 2002; Seiders *et al.*, 2007). This paper proposes SERVCON construct above as independent variable and incorporates it into IS success model by DeLone and McLean (1992). This study proposes new dependent variable, IS SERVCON, to accompany information and system quality. Perceived dependable and usefulness play as intermediate role in this research model. Purposes of this paper is to examine influence of IS SERVCON factors toward IS success model and to test each hypothesis interpreted in the given research model (Fig. 1).

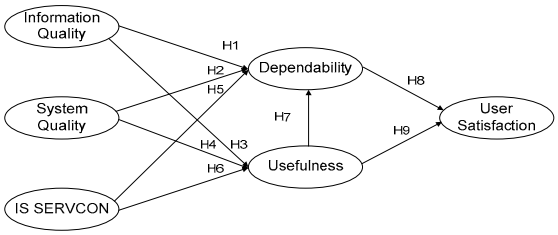

Fig. 1. Research model, IS success

II. IS-Service Convenience

Service convenience has been acknowledged as a multidimensional construct in marketing and customer research literature (Seider *et al*., 2000, 2007; Berry *et al*., 2002). Prior research described SERVCON is used to measure customer's time and effort cost (Berry *et* al., 2002; Seiders *et al*., 2007). Customer's time and effort include time savings, time flexibility, pertaining to time use, energy, location, ease of access, and task allocation. It will be measured from customer's time spending when in interaction with the services and customer's efforts to get information from the system. This study adopted six dimensions from previous service convenient construct (Seiders *et* al., 2000; Berry *et al*., 2002; Seiders, 2007).

IS Decision convenience relates to time and effort expenditure required to decide whether to obtain, purchase or use the IS provided (Berry et al., 2002; Seider et al., 2007; Hua Dai and Salam, 2010). For example, School or University will provide some way to review about their Student Information Systems (SIS) that would reduce user's time and effort before consumption stages. Decision convenience influences user's time and effort to have a trial use of the services. IS Access convenience measures the way users get services (Seiders, Berry, & Gresham, 2000;

Manuscript received April 8, 2012; revised May 12, 2012.

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Seider et al., 2007; Hua Dai and Salam, 2010). To access services with minimum assistance such as online SIS, users will depend on information availability and accessibility of the system. Insufficient information or difficult accessibility may lead users perceive inconvenience. Users will evaluate from system access speed, user interface, and developed media. IS Benefit convenience relates to time and effort expenditure to obtain core benefits of the system (Berry et al. 2002; Seider et al. 2007; Hua Dai and Salam, 2010). Regularly can be a user's favourable return of investment such as time, effort, or other source. More effort and time spending will cause users' perceive inconvenience. IS Transaction convenience relates to users' time and effort to execute or fulfill the transaction (Berry et al. 2002; Seider et al. 2007; Hua Dai and Salam, 2010). Awaiting of system execution causes negative effects of users perceive convenience. When users have decided to select some courses in SIS, they still need to perform the execution phase. IS Post-benefit convenience relates to users' perceived time and effort expenditures to have a contact with service provider after the benefit stage of the service (Berry et al., 2002; Seiders et al., 2007; Hua Dai and Salam., 2010). Post-benefit convenience can be interpreted as after use service and can be related to users' need for system repair or maintenance. IS Search convenience relates to the speed and easiness which users could identify and find the products or services provided (Seiders et al., 2000). This factor can be measured with search engine of services provided. In SIS, users perceive easiness and less effort to search some information needed, such as courses schedule, can lead users' perceive convenience.

All of this service convenience construct can measure users' perceive factors. In this study, users perceive factors proposed as dependability and usefulness (DeLone & McLean, 1992; Lai et al., 2009). According to previous research, service convenience construct have a positive influence toward user's perceived value (Hua Dai and Salam. 2010). Dependable could be defined as the ability of system to deliver function and service, and usefulness closely related to the completion of users jobs and tasks. Less effort and time expenditure to complete user's job and tasks is equated a good system.

H1: IS Service Convenience influences user's perceived dependability of IS Service.

H2: IS Service Convenience influences user's perceived usefulness of IS Service.

III. Information and System Quality

System quality represented by ease of use, which is defined as the degree to which a system "user friendly". System quality was measured in term of ease to use, functionality, reliability, flexibility, data quality, portability, integration, and importance (DeLone & McLean., 2003; Rai *et al*., 2002). Information quality measures information system output, which is the quality of information produced by the systems, especially form of report (DeLone & McLean, 1992; Lai *et al*., 2009) and to matches SIS, prior research generated three attributes of Information possess: content, accuracy, and format (Rai *et al*., 2002).

According to service perspective above, previous study believed that high quality system, easy to read, integrated, and consistent information will lead user's perceive dependability. Also, believed that perceived dependability will be affected by system attributes such as reliability, availability, safety, integrity, maintainability, and security (Lai et al., 2009; Avizienis et al., 2004).

H3: System Quality will have positive effect on perceived dependability of IS

H4: Information Quality will have positive effect on perceived dependability of IS

Perceived usefulness is the degree of user's perspective that use of some particular system would enhance their job performance (Davis, 1989). System that can enhance their job performance will be equipped with good system and information.

H5: Information quality will have a positive effect on perceived usefulness of IS

H6: Systems quality will have a positive effect on perceived usefulness of IS

Perceived Dependability and Usefulness

In service perspective, the ability of IS to deliver function and service is closely related to the completion of user's tasks such as collecting, analyzing, retrieving data, and producing information. That condition will be lead customers perceived dependability.

H7: Perceived usefulness will have a positive effect on perceived dependability with IS

As for the system attribute, dependability of information system belongs to a large scientific domain, not only related to system usability, but also other activities such as system development or implementation technologies. Some researchers defined dependability as a combination of reliability, availability, safety, integrity, confidentiality, and maintainability (Avizienis, Laprie, Randell, and Landwehr, 2004).

Previous research postulated that dependability should be viewed as a multi-attribute rather that single-attribute belief and define as "the extent to which a person believes that they can rely on the functions and service delivered by enterprise applications for their completion of jobs and tasks" (Lai et al., 2009). In some study about SIS, perceived usefulness, which related to enhancing job performance (Davis, 1989), may reflect the degree of user's satisfaction. On the other hand, user satisfaction is the net feeling of pleasure or displeasure that resulted from aggregate of all benefits that user's expect from the service.

H8: Perceived dependability will have a positive effect on users satisfaction with IS

H9: Perceived usefulness will have a positive effect on users satisfaction with IS

IV. Research Method, Data analysis and Result

Data for this study was collected using a questionnaire survey about Student Information System with five-point Likert-point scale in one public university in Central Taiwan. Finally, 290 valid questionnaires were collected. The respondents include 136 male (47%) and 154 female (53%) students from various background studies included undergraduate and post-graduate (included PhD) students. The respondents average 23.91 years in age and had 9.85

years of experience in computer usage.

A. Analysis of Measurement Validity

All analyses were conducted using Structural Equation Model (SEM) using the AMOS 18.0., providing estimates of parameters and test of fit similar LISREL. First of all, construct reliability and validity were established using Confirmatory Factor Analysis (CFA). Convergent validity and discriminant validity were evaluated for the purposed model according to the tree criteria recommended by Formell and Larcker (1981). First, all indicator factor loadings (λ) should be significant. Second, construct reliability in terms of composite reliability (CR), internal consistency on the indicators measurement given factor and computed by taking the square of sums for standardized factor loadings divided by the square of sums for standardized factor loading and sums of error variance should exceed 0.70 for commonly acceptable threshold value (Hair, Anderson, Tatham, and Black, 1988). Third, the average variance extracted (AVE) of each construct should greater than 0.50 to implies significant validity for both the construct and the individual variable.

In this research calculation, the result shows that the factor loading (λ-value) for all items were significant at P≤.001, Table I show the composite reliability (CR) and AVEs (≥0.5) of each factor. Next, Square root of AVE value must exceed shared variance for all factors in order to achieve requirement of adequate discriminant validity (Formel and Lacker, 1981). Table I showed that the results satisfy the entire requirement.

TABLE I: RELIABILITY, CONVERGENT VALIDITY, AND DISCRIMINATE VALIDITY OF MEASUREMENT MODEL

Construct	CR	AVE	Shared variance among constructs					
			SC	IQ	SQ	PD	PU	US
SC	0.9	0.6	**(0.79)**					
IQ	0.87	0.63	0.72 *	**(0.79)**				
SQ	0.85	0.66	0.72 *	0.60 *	**(0.81)**			
PD	0.78	0.64	0.74 *	0.68 *	0.67 *	**(0.80)**		
PU	0.85	0.65	0.72 *	0.65 *	0.69 *	0.71 *	**(0.81)**	
US	0.86	0.75	0.77 *	0.64 *	0.71 *	0.74 *	0.75 *	**(0.87)**
CR = composite reliability; AVE = average variance extracted; * *P*<0.001								

TABLE II: GOODNESS-OF-FIT MEASURES OF THE RESEARCH MODEL

Goodness-of-fit measures	**Recommended value**	**Model statistics**
Goodness-of-fit index (GFI)	≥ 0.90	0.91*
Root mean square error of approximation (RMSEA)	≤ 0.1	0.55*
Normalized fit index (NFI)	≥ 0.90	0.93*
Comparative fit index (CFI)	≥ 0.90	0.97*
Normed Chi-square	≤ 3.0	1.87*
* : acceptable fit		

B. Model Testing Results

Before analyzing path coefficients of research model, first do the goodness-of-fit of a model to the data, including absolute, incremental, and parsimonious fit measures. For absolute fit, goodness-of-fit index (GFI) need to be reported as well as root mean square error of approximation (RMSEA). For incremental fit, normed-fit index (NFI) and comparative-fit index (CFI) need to be measured. And, normed chi-square measures parsimonious fit. Values exceeding 0.9 indicate a good fit for GFI, NFI, and CFI (Bentler & Bonnet, 1980). Value less than 0.1 is considered a good fit for RMSEA (Bollen, 1989), and value less than 0.05 is considered as very good fit for the data. Table II shows detail of goodness-of-fit of this model. Properties of standardized path coefficients, and P-values, and variance explained for each equation in the hypothesize model are presented in Fig. 2.

V. DISCUSSION AND CONCLUSION

With advances innovation in technological field, nowadays many think driven by IT. Appropriate implementation of IT can be worthwhile and enhance the economic, for both customers and service providers through the application and use of IT. Including the information and system quality factors as measurement, adding SERVCON construct to measure the IS success is appropriate to support completeness of IS measurement. Like previous research by Lai *et. al*. (2009), perceived dependability seems very important for E-business success factors. This condition proved with high path value between dependability and user satisfaction (γ=0.71, P<0.001), compared with relationship value of perceived usefulness (γ=0.27, P<0.05). The results show that 90% variance of user satisfaction driven by perceived dependability and perceived usefulness represented that this two factors really match to lead user satisfaction of IS success.

This research has a contribution for current literature and IT service providers as follows. First, Users perceived convenience of the system may lead their confidential to interact with the system and directly affect their reliability of the system. Reliability of the system will drive more users' perceived dependable then perceived usefulness. Advanced functionality of the service or complex database system will lead user's perceived usefulness of the system. And, the end point of IS success, user satisfaction, mostly driven by perceived dependability compared with perceived usefulness factor.

Second, each factor of SERVCON needs to be well implemented to get an attention from the users and maintain long term relationship with the service providers. Third, research results represent that SERVCON construct has a major effect compared with another constructs (information and system quality). For SIS service providers, convenience factors are important factor to make the students feel dependent on the system provided that can have an impact of user satisfaction.

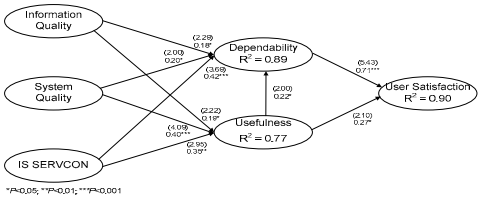

Fig. 2. Model testing result

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