ON CHARACTERISTICS INFLUENCING CONSUMER'S INTENTION TO USE WEB-BASED SELF-SERVICE

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Abstract: Information technology (IT) brings unforeseeable impacts and challenges on service industries. This is because IT creates endless possibilities for them to revolutionize their service delivery process. For example, interactive voice response systems, interactive kiosks, the Internet, and multimedia CDs all become new channels that allow companies to directly communicate with customers. Facing pressure of mounting labor costs, most enterprises rush to adopt technologies to improve their operational efficiency and service quality. The customer's intention to use the web-based self service (WBSS) becomes key factors to determine if the WBSS will be successful. This study adopted the Technology Acceptance Model (TAM) as the basis for the research framework and conducted an empirical study to examine what effects that WBSS characteristics such as response time, responsiveness, and customized control may have on the customers' intention to use the WBSS. The study result indicates that the customized control characteristic directly affects the customers' intention to use the WBSS. It suggests that companies need to enhance the flexibility of the WBSS in the process if service delivery so that the customer can increase the intention to use the WBSS.

1. INTRODUCTION

Thanks to the growing of the technology, companies can apply e-commerce to identify the opportunities presented by the Internet, and as a consequence many established facilities for consumers to service themselves on web sites. Indeed, Internet self-service technology has become a business necessity, rather than a means for companies to gain a strategic advantage. Companies in traditional industries such as the automobile industry, real estate industry, education industry, medication industry, and tourism industry usually provided services via their service staffs in the past. As they were eyeing the benefits of technologies, they also started to contemplate replacing manual labors with technologies.

Self-service technologies (SSTs), are a technology interface that enables customers to independently serve themselves (Meuter et al., 2003). In other words, SSTs allow customers to directly interact with companies and fulfills the purpose of service delivery without involving service staff. Examples of SSTs include interactive voice response systems, interactive kiosk, the Internet, and multimedia CDs. In order to take advantage of the fast growing e-commerce trend and population, many enterprises have started employing a new channel of service delivery - web based self-services (WBSS), to provide customers with a more diverse channel to directly communicate with companies.

As Internet becomes more and more popular, many enterprises also begin providing the WBSS such as online ticketing, online book ordering, online banking, online reservation service for doctor visits, or online package tracking. Yet for companies in the traditional industries, they are still yet to catch on the speed of deploying an adequate WBSS. These companies spend much time and financial resources designing, managing, and deploying a WBSS. If they have no clues how their customers may

perceive the WBSS they provide, how can they really lower their cost and improve their bottom line? What is worse, their inadequately conceived WBSS might just be the reason customers turn to their competitors. Therefore, it is of fundamental importance that companies understand how customers might prefer a WBSS.

Thus, the purpose of this research is to study consumers' intention to use WBSS, identify factors affecting WBSS usages, and provide directions for companies in the traditional industries to design a WBSS. Next sections presents the literature review and explains key terms used in the paper such as WBSS, web usability, and TAM. The research framework, hypotheses, research designs are provided. Finally, this paper provides analyses for the research results and conclusions.

2. LITERATURE REVIEW

2.1. Self-service Technology and WBSS

Self-service Technology (SST) is the practice of serving oneself, usually when purchasing items. Common examples include many gas stations, where the customer pumps their own gas rather than have an attendant do it. Automatic Teller Machines (ATMs) in the banking world have also revolutionized how people withdraw and deposit funds. Self service is used on the phone, web and email to facilitate customer service interactions using automation.

Customers increasingly seek control in their timing and process of conducting transactions and interacting with businesses. Many of the recent self-service offerings such as 24/7 service, order status transparency, remote problem diagnosis, among others, are geared toward providing customers the control they want (Meuter etc al., 2003). Appropriately designed and implemented self-service technologies can increase customer satisfaction, reduce customer defections, and lead to higher customer equity. It also raises the bar for competition.

The web-based self-service (WBSS) is basically a SST that is materialized over the Internet. Therefore, this study defines WBSS as service activities that allow consumers to perform independently. Zeithaml and Bitner (2000) emphasized that the advent of the Internet facilitated the development and popularization of the WBSS. Online retail purchasing, online airline ticketing, and online tracking for shipped merchandise are all examples of the WBSS.

As we can see from relevant literatures, although scholars proposed different dimensions for WBSS evaluations, most were focused on enhancing consumer values and benefits, website convenience, and easiness of website usage. Although many functions of WBSS can be from different commerce, for this study, we only limit the scope to the consumer service oriented WBSS.

2.2. Web Usability

Nielsen (2000) referred web usability to the usability of a website as a standard to evaluate the design of a web interface. In other words, web usability accesses whether a website design can satisfactorily meet user needs and effectively assist users to quickly obtain their goals. He suggested that web usability should incorporate the following concepts: navigation, response time, credibility, and contents. For good website designs, Nielsen offers the following tips: valid link, frequent updates, minimized download duration, high information relevancy for users, and high quality content. Among all elements, navigation is the most important one as it pertains to the level and structure of the website and enables users to more effortlessly find information they need.

Palmer (2002) developed some performance indexes of web usability through the researches proposed by most contemporary scholars and literatures (regarding usability in general and richness of media content) and which is shown as Table 1. She concluded that website usability and related concepts will indeed influence the frequency of use, intention of repeat visits, and satisfaction of website uses. These concepts can be used as reference when designing a website and to enhance the usefulness of a website.

Idu	ne. 1. Faimer (2002) web site Usability, De	sign and remonnance metrics
Construct	Measures	Sources
Download Delay	Initial Access Speed	Barney, 2000
Navigation/Organization	Arrangement, Sequence	Schubert and Selz, 1998;
		Shneiderman, 1998
Interactivity	Customization, Interactivity	Jarvenpaa and Tod, 1997;
		Shneiderman, 1998
Responsiveness	Feedback, FAQ	Shneiderman, 1998
Information/Content	Amount and Variety of information	Shneiderman, 1998
		Evans and Wurster, 2000

Table.1: Palmer (2002) Web Site Usability, Design and Performance Metrics

2. 3. Technology Acceptance Model



Figure.1: The Technology Acceptance Model

Davis suggested two important variables that critically affect user behaviors of information systems: PU, or perceived usefulness, and PEU, or perceived ease of use. He advocated that in order to encourage users to use an information system, users have to clearly realize the benefits of the information system via the easiest mean possible (including time and energy). Therefore, Davis referred PU to the subjectively perceived possibility that an information system can improve work performance for potential users and PEU as the perceived degree of effortlessness potential users to use an information system. This study only examined the factors affecting users on using a WBSS. Thus, TAM also applies for this study. Therefore, this study referred to TAM, the most widely accepted examination model for usages of information systems in recent years, as the basis for the research framework to develop the WBSS model.



3.2. Development of hypotheses

WBSS

3.2.1. Characteristics of a WBSS

The responsiveness measures if a website provides users a well-designed responsiveness or other channels for users to directly communicate with a company. Typical channels of feedback include order tracking FAQ (Frequently Asked Questions), emails, and message boards. Jarvenpaa and Todd (1997) discovered that the ability of a vreparte to respond to average shoppers is a key issue that most online shoppers concern. Evans and Wurster (2000) followed up on this finding and co that the responsiveness and ability to answer user questions are of fundament. Customized control is the ability of users to control outcomes of their portance to a website.

own decisions. Examples of such abi ability to make independent decisions or design services that they prefer. Averill (1973) concluded that if user customized control to design services or alter their own decisions flexibly, they will feel they are in control. Most scholars this viewpoint and agree that self-control is the primary factor affecting user adoption for SST (Globerson and Maggard, 1991; Dabholkar, 1996). For this study, customized control is defined as the ability of users to flexibly modify their own decisions. For users of WBSS, if they can maintain a higher level of control, they will feel the website is more useful and can more successfully obtain their goals.

in their goals. In presenting his research result of successful SST, Bitnet et al (2002) idvocated that one of the main reasons that customers repelled by SST is that they do not know how to use SST. Therefore, companies should seriously consider providing are repelled by SST is that they do not know how to use educational assistances for users if they expect users to quickly adopt to SST. Such assistances could range from step-by-step guides, instructions that allow users to experiment with SST, or helpful FAQs. Therefore, if a website can provide a well-designed responsiveness to assist users in solving their problems immediately, users will feel that the website is useful and helpful.

This research selected the response time, responsiveness, and customized control as the factors of the WBSS characteristics. Lovelock and Young (1979) discovered that the reason that most people prefer self-services is that they can save a substantial amount of time for users. Most scholars also agree to this view point (Globerson and Maggard, 1991; Dabholkar, 1996).

> Perceived Η3 Response Ease of Use Time for a WBSS

Shneiderman (1998) further pointed out that the waiting time is very important to users as they generally do not enjoy wasting too much time waiting for a response from a website. Rose and Straub (2001) also identified that an efficient website should shorten waiting time as much as possible. Therefore, if the response time of WBSS that a website offers is unreasonably slow, then users may perceive a low PEU for that WBSS as they feel it is very inconvenient to use that WBSS.

Therefore, the hypothesis 1, 2, and 3 of the characteristics of WBSS that impact on the PU and PEU are following below:

- H1. There is a positive relationship between the quality of WBSS responsiveness and consumers' perceived usefulness.
- H2: There is a positive relationship between the customized control of WBSS and consumers' perceive usefulness.
- H3. The faster the response time for a WBSS, the higher consumers' perceived ease of use for a WBSS.

3.2.2. TAM for a WBSS

The TAM model implies that PU and PEU are not just two parallel variables, and that PEU has a positive influence on PU. Researchers have shown that of two identical information systems, users will perceive a higher PU for an information system if that information system has a higher PEU. This is because the information system is directly related to users' jobs, and the level of PEU can greatly affect working efficiency for users. Thus, users will perceive that the system is very useful. Additionally, many scholars also proved that PEU exerts a positive influence on PU with their research (Venkatesh and Davis, 1996; Davis, 1989). This conclusion illustrates that when users perceive that a certain information system is very useful. Thus, if users feel that the website is very easy to navigate and to help them find needed information and services, then users will perceive the website is very useful.

Davis (1989) discovered that two perception dimensions (PEU and PU) affect user attitudes toward using (ATU) technologies, which then affects user intentions for using technologies. This is to say that if consumers perceive that the online banking service is easy to use and useful, then their intention to use that service will be higher. Moon and Kim (2001) also proved this causal relationship. They concluded that PEU and PU are both the main considerations that users choose to visit and place online orders at a website.

Therefore, the hypothesis 4 positive relationship between consumers' perceived usefulness and ease of use for a WBSS. And the study assumes that if consumers perceive a WBSS is useful, convenient, and easy to use, then consumers will exhibit a positive intention to use the WBSS. The fourth, fifth and sixth hypotheses are presented below:

- H4: There is a positive relationship between consumers' perceived usefulness and ease of use for a WBSS.
- H5: There is a positive relationship between consumers' perceived usefulness and attitudes toward using that WBSS.
- H6: There is a positive relationship between consumers' perceived ease of use and attitudes toward using that WBSS.
- H7: There is a positive relationship between consumers' perceived usefulness and intention to use that WBSS.
- H8: There is a positive relationship between consumers' attitudes toward using and intention to use that WBSS.

3.3. Research Design

This study conducted interviews to perform preliminary researches. The goal was to identify the WBSS functions and services that companies in the traditional industries intend to have for their customers. We first interviewed three managers from the real estate, automobile, and logistics industry. In addition to WBSS functions for the presale, during-sale, and post-sale phrases, the respondents were asked to pick the most important WBSS character from the six WBSS characteristics identified in the literature review.

As we can see from Table 2, companies in different industries have different focus as well as viewpoints toward the importance of each of the characteristics. In general, most respondents thought that response time, navigation, responsiveness, and customized control are the more important ones, while website content and interactivity are of lower importance. This preliminary research not only verified the importance for each of the characteristics, provided supports for the research framework, but also enabled the research design to be more realistic and close to the industrial environment, which enhances the external reliability for the study.

	Table.2: the most important W	BSS characteristics in differ	rent industries
WBSS Characteristics	Realtor	automobile	logistic
Download Delay	agree		agree
Navigation/Organization	agree	agree	
Information/Content		agree	
Interactivity			
Responsiveness	agree	agree	agree
Customized Control		agree	agree

3.4. Experimental Manipulation

The main purpose of this research is to study consumers' intention to use a WBSS site for companies in the traditional industry. In order to distinguish the causal relationship between dependent variables and independent variables and ensure the reliability and validity for the research result, we conduct the scenario analysis of experiment design as the methodology. The experiment design includes three independent variables, two intermediate variables, and one dependent variable. The independent variables are response time, responsiveness, and customized control. The two intermediate variables include PU and PEU. The dependent variable is ITU. This study further set up two levels for each of the independent variables – fast response time and slow response time, well thought out responsiveness and poor conceived responsiveness, and high customized control and low customized control, which brings up a total of eight situations. The subjects were randomly assigned to one of the situations. Each variable manipulation is shown as table 3.

	Table.3: variable manip	oulat	ion of experimental design
Variables	Definitions	Μ	anipulations
Responsiveness	The responsiveness measures if a	1.	Well-designed responsiveness: a
(RP)	website provides users a		combination of FAQs, a message board, and
	well-designed responsiveness or		emails as the responsiveness is offered
	other channels for users to directly	2.	Poor-conceived responsiveness: only emails
	communicate with a company.		as the sole channel of feedback is used.
Customized control	The customized control is the degree	1.	Higher customized control: a WBSS
(CC)	of flexibility that a system or website		website allows consumers the flexibility to
	is able to offer users.		change or make their own decisions.
		2.	Lower customized control: a WBSS
			website limits the flexibility for consumers
			to change or make their own decisions.
Response time	Including the response time for	1.	Faster response time: zero second for
(RT)	homepage access and for accessing		accessing a webpage from a inter-page link.
	web pages from inter-page links.	2.	Slower response time: eight second for
			accessing a webpage from a inter-page link.

3.5. Participants

Graduate and undergraduate master students from management of college at an university from Taiwan acted as participants. The only prerequisite for participation was that the students be knowledgeable about using computers and familiar with the websites. Participants were recruited by mailing brief presentations and invitation with 240 students. Finally, 90 students participated and 70 finished the experiment.

Approximately 78.6 percent of the participants were in the age group of 26 to 40, and approximately 21.4 percent were 40 or younger. Most were female (64 percent), Most (95.7 percent) had spent at least 4 year using the Internet, and Approximately 54.3 percent of the participants had experience using online reservation systems, but most (61.4 percent) were preferred services through staffs.

4. RESULTS

This study used statistical methods to analyze data and then explained and discussed the result based on the analyzed findings. SPSS 10.0 is used as the main statistical analysis software to verify the relationship between variables and test hypotheses for this study.

To access the reliability for the research result, this study uses Cronbach's α value. Hair et al. pointed out that α value has to be larger than 0.7 for the variable to be reliable. All of α values for each variable were 0.9 or above (PU=0.91, PEU=0.90, ATU=0.94, ITU=0.93). Thus, this result of this research is reliable. For testing the participants' perceived significant difference of each variable manipulation, we conduct the t test analysis. And all results were proved that participants can perceive each variable manipulation clearly (RP=2.98**, CC=4.37***, RT=3.65**).

In terms of hypothesis tests, this study aims to examine the causal relationship between the response time, responsiveness, and customized control and PEU and PU. Thus, the study adopted Multivariate Analysis of Variance to perform statistical analysis. From Table 4, the results show that the relationship between responsiveness and PU is not significant, and thus H1 is not supported, but when data is classified based on experience on online reservations, the statistics indicated that the responsiveness exerts a great influence on PU for those who did not have experience making online reservation (P < 0.003). This is probably attributed to the fact that those who ever used online reservation services had bad experiences (such as the website made a certain promise that they did not deliver as a result). Thus, even though the experimented website provided a combination of feedback channels, users were still very conservative about the WBSS.

Next, the customized control exhibited a significant influence on PU, which confirmed H2 and showed that the customized

control of a website will directly affect PU for the users. This result proved the finding that self-control is the reason that consumers choose to use self-services as proposed by most scholars (Globerson and Maggard, 1991; Dabholkar, 1996). Therefore, when designing a WBSS, enterprises need to provide consumers the ability to flexibly make changes they prefer in order to increase their intention to use the WBSS.

Then, the response time of a WBSS does not have a significant influence on PEU and hence, H1 is not confirmed. We first cross-reference the data of both types of response time (fast response time: M=1.71; slow response time: M=3.07) to the data of PU and found that there is no significant correlation between them (P< 0.000). However, when we compared data of both types of response time to the data of the population who generally acquire services from service staffs, then a significant correlation is observed (P< 0.05). The possible explanation is that this group of respondents are used to the response time of service staff and thus would unconsciously form an response time requirement, and compare that response time to that of the WBSS. Thus, if an enterprise want to promote a WBSS, that enterprise need to take the response time into account and keep the response time within a reasonable range. Only by so doing would enterprises be able to encourage their customers to change their habits and use the promoted WBSS.

	Table.4: WBSS characteristics impact on PU and PEU		
Independent variable	Dependent variable	F value	p-value
Responsiveness	Perceived Usefulness	1.413	0.240
Customized Control	Perceived Usefulness	18.8	0.000***
Response Time	Perceived Ease of Use	0.324	0.571
*** -0.001			

*** p<0.001

Finally, we conduct the regression analyses to examine the causal relationship between PEU and PU (H4), between PU and ATU (H5), between PEU and ATU (H6), between ATU and ITU (H7) and between PU and ITU (H8). The results were presented in table 5 and all exhibited significant positive linkage between these variables and supported H4 to H7. This means that PEU will affect PU, which in turn affects intention to use the WBSS. The results confirmed each of the hypotheses and proved that it is appropriate to use TAM as the model for the WBSS.

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Independent variable	Dependent variable	T value	p-value
Perceived Ease of Use	Perceived Usefulness	8.358	0.000***
Perceived Usefulness	Attitudes Toward Using	12.521	0.000***
Perceived Ease of Use	Attitudes Toward Using	9.082	0.000***
Perceived Usefulness	Intention to Use	10.199	0.000***
Attitudes Toward Using	Intention to Use	12.519	0.000***

Table.5: linkage between PU, PEU, ATU and ITU for a WBSS

*** p<0.001

5. CONCLUSION

This study utilized the TAM model as the basis for developing the model impacting on intention to the WBSS, adopted the situational approach, and used response time, responsiveness, and customized control to examine their effects on ITU. The analyses showed that the customized control is the critical factor affecting user ITU. The analyses further suggested that companies in the traditional industries should provide consumers with a greater flexibility to make or change their decisions in service processes when they design a WBSS. So consumers will have a higher intention to use the WBSS.

Additionally, the results also illustrated that response time has an influence on consumers who generally acquire services from service staff. This implies that enterprises should ensure a proper response time for this type of consumers if they want to increase intention of using for consumers of this group. On the other hand, although H2 was not confirmed, the responsiveness did have an impact on consumers who never made any online reservations. Thus, companies can encourage this type of consumers to use a WBSS by improving responsiveness. Finally, the research result verified the influence that PU and PEU have on intention to use the WBSS, identified key factors affecting the use of a WBSS for users, and pointed a direction for companies to design and manage their WBSS.

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APPENDIX A

	Table.A1: Measurement of variables (questionnaire items)
Constructs and indicators	Questionnaires
Responsiveness	The response of the request that WBSS provides is good enough for me.
Customized Control	That WBSS provides good flexibility and modified capability.
Response Time	The speed in which WBSS provided service is fast enough.
Perceived Usefulness	I feel helpfulness when using that WBSS.
	It makes useful information of service to me using that WBSS.
	It is benefit to me when using that WBSS

	Overall, it is useful using that WBSS.
Perceived Ease of Use	I find using that WBSS is easy for me.
	I don't spend much time to learn how to use that WBSS.
	It is easy to find what I want to know using that WBSS.
	Overall, it is easy to use that WBSS.
Attitudes Toward Using	I'll like to use that WBSS.
	Using that WBSS will be good.
	Using that WBSS will be interesting.
	I'll be positive about using that WBSS.
Intention To Use	I'll intend to use that WBSS as soon as possible.
	I'll use that WBSS soon after starting it.
	I prefer using that WBSS for requiring services rather than through service
	staffs.
	Overall, I perceive intention to use that WBSS.